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Faculty of Agricultural and Environmental Sciences, page 356

ABEN – Agricultural Engineering
 AEBI – Biology (Agric & Envir Sc)
 AEHM – English (Agric & Envir Sc)
 AEMA – Mathematics (Agric & Envir Sc)
 AEPH – Agricultural Physics
 AGECE – Agricultural Economics
 AGRI – Agriculture
 ANSC – Animal Science
 BTEC – Biotechnology
 CELL – Genetics
 ENTO – Entomology
 EXTM – Extension Methods
 FDSC – Food Science
 MICR – Microbiology (Agric & Envir Sc)
 NRSC – Natural Resource Sciences
 NUTR – Nutrition and Dietetics
 PARA – Parasitology
 PLNT – Plant Science
 SOIL – Soil Science
 WILD – Resource Development
 WOOD – Woodland Resources
 ZOOL – Zoology

Faculty of Arts, page 370

ACOM – Arts Computing
 AFRI – African Studies
 ANTH – Anthropology
 ARTH – Art History
 CANS – Canadian Studies
 CATH – Catholic Studies
 CLAS – Classics
 EAST – Asian Lang & Literature
 ECON – Economics (Arts)
 EFRL – English and French Language
 ENGC – English Communications
 ENGL – English (Arts)
 ESLN – English Second Language
 FREN – French (Arts)
 FRSL – French Second Language
 GERM – German (Arts)
 HISP – Hispanic Studies (Arts)
 HIST – History
 HMST – Humanistic Studies
 HPSC – Hist and Phil of Science
 HSEL – Health Science Electives
 INTD – International Development
 ISLA – Islamic Studies
 ITAL – Italian (Arts)
 JWST – Jewish Studies
 LACS – Latin American & Caribbean Studies
 LING – Linguistics
 MEST – Middle East Studies
 MUAR – Music - Arts Faculty
 NAST – North American Studies
 PHIL – Philosophy
 POLI – Political Science
 QCST – Quebec Studies
 RUSS – Russian (Arts)
 SOCI – Sociology (Arts)
 SSMD – Social Studies of Medicine
 SWRK – Social Work
 WMST – Women's Studies

Faculty of Education, page 423

EDEA – Arts Education
 EDEC – Curriculum and Instruction
 EDEE – Elementary Education
 EDEM – Administration and Policy Studies in Education

EDER – Religious Studies
 EDES – Secondary Education
 EDET – Vocational Education
 EDFC – Bachelor of Education Core Program
 EDFE – Student Teaching
 EDKP – Physical Education
 EDPC – Ed Psych & Couns (Counselling)
 EDPE – Ed Psych & Couns (Psychology)
 EDPH – Ed Psych & Couns (Collegial)
 EDPI – Ed Psych & Couns (Inclusive)
 EDPT – Ed Psych & Couns (Media)
 EDSL – Education In Second Languages

Faculty of Engineering, page 437

ARCH – Architecture
 BMDE – Biomedical Engineering
 CHEE – Chemical Engineering
 CIVE – Civil Engineering
 ECSE – Electrical Engineering
 FACC – Faculty Course
 MECH – Mechanical Engineering
 MIME – Mining, Metals, Materials Engineering
 MPMC – McGill/Poly Mining Coop
 URBP – Urban Planning

McGill School of Environment, page 456

ENVR – Environment

Faculty of Management, page 457

ACCT – Accounting
 BUSA – Business Administration
 FINE – Finance
 INDR – Industrial Relations
 INSY – Information Systems
 MGCR – Management Core
 MGPO – Management Policy
 MGSC – Management Science
 MRKT – Marketing
 ORGB – Organizational Behaviour

Faculty of Music, page 463

MUCO – Composition
 MUCT – Choral Techniques
 MUEN – Ensemble
 MUGT – General Music Techniques
 MUHL – Music History and Literature
 MUIN – Practical Instrument
 MUIT – Instrumental Techniques
 MUJZ – Jazz Studies
 MUMT – Music Technology
 MUPG – Performance
 MUPP – Performance Practice
 MUSP – Musicianship
 MUTH – Music Theory and Analysis

Faculty of Religious Studies, page 473

RELG – Religious Studies

Faculty of Science, page 477

ANAT – Anatomy and Histology
 ATOC – Atmospheric and Oceanic Sciences
 BIOC – Biochemistry
 BIOL – Biology (Sci)
 BIOT – Biotechnology
 CHEM – Chemistry
 COMP – Computer Science (Sci)
 EPSC – Earth and Planetary Sciences
 EXMD – Experimental Medicine
 GEOG – Geography
 MATH – Mathematics and Statistics (Sci)
 MIMM – Microbiology and Immunology (Sci)
 NEUR – Neurology and Neurosurgery
 PATH – Pathology
 PHAR – Pharmacology and Therapeutics
 PHGY – Physiology
 PHYS – Physics
 PSYC – Psychology
 PSYT – Psychiatry

Index of Courses by Subject Code, page 512

Students should check the Class Schedule well in advance of registration to determine which courses will be offered in 2003-04. Bullets (the "not offered this academic year" symbol) are missing from some courses printed in this Calendar. New courses may also have been added, or courses rescheduled or cancelled, after the Calendar went to press.

Course Information and Regulations

Students are advised to refer also to the **General Information and Regulations** section of this Calendar, in particular the sections, **“Registration” on page 27** and **“Student Records” on page 33**,

The University reserves the right to make changes without prior notice to the information contained in this publication, including the the revision or cancellation of particular courses or programs.

At the time this Calendar went to press, new courses and modifications to some existing courses were under consideration. Students preparing to register are advised to consult **Class Schedule on the Web** at www.mcgill.ca/minerva for the most up-to-date information on courses to be offered in 2003-04.

Not all courses listed are offered every year.

1. Course Numbering

Each McGill course is assigned a unique seven-character course “number”.

The first four characters (**Subject Code**) refer to the unit offering the course.

These codes were implemented in September 2002, replacing the three-number Teaching Unit Codes previously used. A complete list of Teaching Unit Codes and their Subject Code equivalents can be found on the Web at www.mcgill.ca/students-information.

The three numbers following the **Subject Code** refer to the course itself, with the first of these indicating the level of the course.

- Courses numbered at the 100, 200, 300, and 400 levels are intended for undergraduate students. In most programs courses at the 300 level and 400 level are normally taken in the student’s last two years.
- Courses at the 500 level are intended for graduate students, but may also be open to qualified senior undergraduate students.
- Courses at the 600 and 700 level are intended for graduate students only.

Two additional characters (D1, D2, N1, N2, J1, J2, J3) at the end of the seven-character course number identifies multi-term courses.

2. Multi-term Courses

Most courses at McGill are single term (Fall or Winter or Summer) courses with final grades issued and any credits earned recorded at the end of that term. Single term courses are identified by a seven-character course number.

A unit may, however, decide that the material to be presented cannot be divided into single term courses or it is preferable that the work to be done is carried out over two, or three, terms. Under such circumstances, courses are identified by a two-character extension of the course number.

In some cases, the same course may be offered in various ways: as a single term and/or in one or more multi-term versions. The course content and credit weight is equivalent in all modes, the only difference being the scheduling, and students cannot obtain credit for more than one version.

Courses with numbers ending in D1 and D2 are taught in two consecutive terms (most commonly Fall and Winter). Students must register for the same section of both the D1 and D2 components. No credit will be given unless both components (D1 and D2) are successfully completed in consecutive terms, e.g., Fall 2003 and Winter 2004.

Courses with numbers ending in N1 and N2 are taught in two non-consecutive terms (Winter and Fall). Students must register

for the same section of both the N1 and N2 components. No credit will be given unless both components (N1 and N2) are successfully completed within a twelve (12) month period.

Courses with numbers ending in J1, J2 and J3 are taught over three consecutive terms. Students must register for the same section of all three components (J1, J2, J3). No credit will be given unless all three components are successfully completed.

IMPORTANT CONDITIONS FOR MULTI-TERM COURSES

1. **Students must be registered for each component of the multi-term course. Students must ensure that they are registered in the same section in each term of the multi-term course.**
2. **Students must successfully complete each component in sequence as set out in the multi-term course. Credit is granted only at the end of the multi-term course; no credit is given for partial completion.**

3. Course Terminology

Prerequisite: Course A is prerequisite to course B if a satisfactory pass in course A is required for admission to course B.

Corequisite: Course A is corequisite to course B if course A must be taken concurrently with (or may have been taken prior to) course B.

Credits: The credit weight of each course is indicated in parentheses beside the course title. For further information refer to **“Credit System” on page 33**.

COURSE NOMENCLATURE IN PROGRAM DESCRIPTIONS:

Required Course: Courses absolutely required in a program. All students in that program must take this (these) course(s) unless they are granted exemption(s).

Cours obligatoire: Cours foncièrement obligatoire dans un programme. Tous les étudiants inscrits à ce programme doivent suivre ce (ou ces) cours, à moins de bénéficier d'exemptions.

Complementary Course: Courses selected from a restricted list, a particular subject area, or a discipline. In some programs, students must include a number of these in order to meet program requirements.

Cours complémentaire: Cours sélectionnés à partir d'une liste limitée, ou de la liste des cours offerts dans une matière particulière ou dans une discipline. Dans certains programmes, les étudiants doivent inclure un certain nombre de ces cours afin de satisfaire aux exigences du programme.

Note: Complementary courses are not electives. The difference between Complementary courses and Required courses is that Complementary courses offer an element of choice, however small that choice may be. Students may choose from the two (or more) courses specified within Complementary Course segment(s) of a program description, but ONLY from those.

Elective course: courses chosen freely (sometimes with advice and approval of the departmental adviser or the Student Affairs Office).

Cours au choix: Cours librement choisis (parfois sur le conseil et avec l'approbation d'un conseiller du département ou le Bureau des affaires étudiantes).

4. First-Year Seminars

First-Year Seminars (FYS) are limited-enrolment credit courses offered by the Faculties of Arts and Science to students in their first year of undergraduate study at McGill, i.e., newly admitted students in U0 or U1. Students in any faculty can enrol in an FYS, subject to the conditions and/or restrictions of the program in which they are registered. Students may take only one FYS.

FYS classes are limited to a maximum of 25 students and are designed to provide closer interaction with the professor and better working relations with peers than are available in large introductory courses. The seminars endeavour to teach the latest scholarly developments and expose participants to advanced research methods. Registration is on a first-come, first-served basis.

For a listing of First-Year Seminars, see Faculty of Arts "[First Year Seminars](#)" on page 56 and Faculty of Science "[Registration for First-Year Seminars](#)" on page 250.

5. Faculty/School-Specific Information

Agricultural and Environmental Sciences

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section of this Calendar.

Students should note that there are no supplemental examinations in Agricultural and Environmental Sciences, and that the final examination period timetable for the term is posted before the commencement of classes.

Arts

All Arts courses have limited enrolment.

Term(s) offered (Fall, Winter, Summer) may appear after the course credit weight to indicate when a course would **normally** be taught.

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section of this Calendar. Particular notice should be taken of:

[Program Requirements](#), see page 48,
[Course Requirements](#), see page 49,
[Course Registration](#), see page 51.

Education

Some courses will be available in the evenings only, through the Centre for Continuing Education, or will be offered during the Summer term.

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section of this Calendar. Particular notice should be taken of prerequisite and corequisite courses and registration for Field Experience courses.

Engineering

Most courses offered by the Faculty of Engineering are limited to Engineering students only. Non-Engineering students should obtain permission from the Associate Dean of their Faculty, and the Faculty Student Advisor in the Faculty of Engineering Student Affairs Office, to register for Engineering courses.

A limited number of School of Architecture (ARCH) courses are open to students not registered in the School. Please refer to individual course descriptions.

The average division of time for a course is indicated in hours in the course listing after the course credit. For example, (3) (3-0-6) indicates a three-credit course consisting of three lecture hours per week, no other contact hours and six hours of personal study per week.

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section of this Calendar.

Environment, McGill School of

Students in the School's programs must comply with the regulations and requirements of their faculty of registration (Agricultural and Environmental Sciences, Arts, or Science), as contained in the Faculty's section of this Calendar.

Management

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section of this Calendar. Particular notice should be taken of: "[B.Com. Program Requirements](#)" on page 193, "[B.Com. Program Structure](#)" on page 195 and, especially for students new to the program, "[Management Core](#)" on page 195.

Music

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section.

Religious Studies

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section.

Science

All Science courses have limited enrolment.

Term(s) offered (Fall, Winter, Summer) may appear after the course credit weight to indicate when a course would **normally** be taught.

Students in the Faculty must comply with the regulations and requirements contained in the Faculty section of this Calendar. Particular notice should be taken of:

[Program Requirements](#), see page 247,
[Course Requirements](#), see page 247,
[Course Registration](#), see page 249.

6. Course Symbols

The symbols listed below may appear in front of courses described in this Calendar. When used, they represent the following information:

- Denotes courses not offered in 2003-04.
- ★ Denotes courses taught only in alternate years.
- ◆ Indicates that departmental approval/permission must be obtained by a student prior to registration.
- Denotes courses with limited enrolment.

Faculty of Education symbols:

- † Denotes courses not available as Education electives.
- ▲ Denotes courses offered by the Faculty of Education which, if appropriate to the student's program, may be included in the academic concentration.
- * Denotes courses which, because they are scheduled around practice teaching, are open only to Bachelor of Education students.

School of Dietetics and Human Nutrition symbol:

- ‡ Professional Practice (Stage) in Dietetics involving special prerequisites.

Faculty of Agricultural and Environmental Sciences

ABEN – Agricultural Engineering

Offered by: Department of Agricultural and Biosystems Engineering

Former Teaching Unit Code: 336

Note: Instructors may refuse registration in a course to any student who does not have, in their opinion, an adequate background in the area.

Graduate courses available to senior undergraduates with permission of the instructor.

ABEN 103 LINEAR ALGEBRA. (3) (3 lectures and 1 conference) Vectors: equality and inequality, geometric representation, polar form, addition and subtraction, unit vectors, dot product, cross product, triple scalar and vector products, use of vectors in 3-D geometry. Matrices: definition, equality and inequality, addition and subtraction, multiplication, null matrix, identity matrix, triangular and diagonal matrices, determinants, matrix inverse, matrix applications.

ABEN 210 MECHANICS 1. (4) (3 lectures and 2 hours lab or problems) Non-concurrent force systems; analysis of simple trusses and multiforce frames; friction, shearing forces and bending moments in beams and frames; centres of gravity; solution of problems by energy methods.

ABEN 211 MECHANICS 2. (4) (3 lectures and 2 hours labs or problems) (Prerequisite: ABEN 210) Kinematics, dynamics, energy, momentum, relative motion, the moment of momentum of particles and rigid bodies; the inertia tensor; introduction to vibrations.

● **ABEN 212 GRAPHICS.** (3) (1 lecture and two 2-hour labs)

★ **ABEN 214 SURVEYING.** (3) (2 lectures and one 3-hour lab) The engineer's level and the theodolite are used to perform benchmark circuits, profile levelling, topographic maps and straight line extensions. A total station, computer programs and use of GPS are introduced.

ABEN 216 MATERIALS SCIENCE. (3) (2 lectures and one 2-hour lab) Relation between structure and properties in ceramic and organic materials. Bonding, structures, imperfections. Phase diagrams. Shaping, joining and testing of materials. Heat treatment, work in hardening and annealing of metals, introduction to physical metallurgy and processes. Failure theories.

ABEN 217 HYDROLOGY AND DRAINAGE. (3) (3 lectures, one 2 hour lab) Measurement and analysis of components of the water cycle, and their relation to drainage. Precipitation, mass curves, intensity-duration frequency relationships. Evaporation from lakes, soil and vegetal covers. Interception, infiltration, groundwater, runoff hydrograph components. Estimation of water quantities and water flow rates for design of water control projects. Design of drainage systems.

ABEN 251 MICROCOMPUTER APPLICATIONS. (3) (3 lectures and one 2-hour lab) A user level computing course oriented toward the use of microcomputers rather than programming. Networks, Windows, FTP, web searching, e-mail, word processing, web pages, spreadsheets, slide shows, and other uses.

ABEN 252 STRUCTURED COMPUTER PROGRAMMING. (3) (3 lectures and one 2-hour lab) A user level computer programming course in Fortran-90 language. The pros and cons of computerization, differences between mainframe and microcomputers, network basics, discussion of the use of Fortran-90 and C languages to solve engineering problems, electronic spreadsheet analysis and the use of other software packages will be studied from an engineering point of view.

ABEN 300 ELEMENTS OF AGRICULTURAL ENGINEERING. (3) (Restriction: Not open to students who have taken ABEN 200.) Principles of the engineering infrastructure supporting the symbiotic/parasitic agricultural ecosystem. Topics include the thermody-

amic, equipment, systems and environmental considerations of land development, cultivation, drainage and irrigation; soil and water quality conservation; plant and animal production environments; food and feed harvesting storage and processing; automation, robotics and information systems.

ABEN 301 BIOTHERMODYNAMICS. (3) (3 lectures and one 2-hour lab) Classical thermodynamic analysis of pure and simple compressible systems. The course covers the first and second laws of thermodynamics. It deals with basic concepts of thermodynamics and thermochemistry in biological system.

ABEN 305 FLUID MECHANICS. (4) (3 lectures and one 2-hour lab or problems) (Prerequisites: ABEN 211, AEMA 202) Properties of fluids; fluid statics; principles of flow of incompressible and compressible fluids; dimensional analysis boundary layers; conduit and open channel systems; simple applications to turbo machinery.

ABEN 312 CIRCUIT ANALYSIS. (3) (3 lectures and one 2-hour lab or problems) (Prerequisite: AEMA 205) General circuit laws and d.c. circuits; electromagnetic circuits; inductance and capacitance, natural and forced response of circuits; analysis of single phase and three phase networks; transformers, AC and DC motors/generators.

ABEN 314 AGRICULTURAL STRUCTURES. (3) (3 lectures and 2-hour lab) Analysis and design of structures to house animals and plants and to process and store animal and plant products. Introduction to environmental control systems and animal waste management.

ABEN 315 DESIGN OF MACHINES. (4) (3 lectures, 2 hours problems) (Prerequisite: ABEN 341) Design of shafting, bearings, gear, belt and chain drives, clutches, brakes, vibrations, fasteners, welded joints, frames. Principles and practices of Engineering Drawing will be adhered to in laboratory submissions.

ABEN 319 APPLIED MATHEMATICS. (3) (1 lecture, two 2-hour labs) (Prerequisite: ABEN 252) This is a computer-based course taught via personal computer technology. The objectives of the course are to familiarize students with a number of computer-based mathematical engineering tools and to teach them how to effectively do mathematics with these. Subjects covered are: data conversion; data modelling and curve fitting; 3D geometry; vector and matrix algebra; filtering and filter design. A number of commercial software products will be used; these will be updated as the technology evolves.

★ **ABEN 322 FOOD PRODUCTION/PROCESSING WASTE MANAGEMENT.** (3) (2 lectures and one 2-hour lab) An introduction to engineering aspects of handling, storage and treatment of agricultural and food industry wastes. For all three of these components, design criteria will be elaborated and related to the characteristics of various wastes. Treatments reviewed will discuss physical, chemical and biological systems.

ABEN 324 ELEMENTS OF FOOD ENGINEERING. (3) (3 lectures) (Pre/Co-requisite: FDSC 330) (Not open to students in the B.Sc.(Agr.Eng.) program) A course in basic food engineering for non-engineering students, covering heat transfer, mass and energy balances, food process unit operations, material transport/steam/refrigeration systems.

ABEN 325 FOOD ENGINEERING 1. (3) (3 lectures and one 3-hour lab) Heat and mass transfer, enthalpy and mass balances, sterilizing, freezing, fluid flow, pipes, steam, refrigeration, pumps and valves.

ABEN 330 GIS FOR BIOSYSTEMS ENGINEERING. (3) (2 lectures and one 2-hour lab) Applications of PC-based Geographic Information Systems (GIS) to the presentation and analysis of natural resources information. Spatial data sources and capture, data structure and analysis and modelling will be reviewed with reference to natural resource management and environmental concerns.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ABEN 341 STRENGTH OF MATERIALS. (4) (3 lectures and one 3-hour lab) (Prerequisite: ABEN 210) Stress, strain, resilience, elastic and plastic properties of materials; bending moment and shear force diagrams; bending and shear stress; deflections; simple, fixed and continuous beams, torsion and helical springs, reinforced concrete beams; columns, bending and direct stress; general case of plane stress; Mohr's circle.

● **ABEN 411 OFF-ROAD POWER MACHINERY.** (3) (2 lectures and one 3-hour lab) (Prerequisite: ABEN 211)

ABEN 412 AGRICULTURAL MACHINERY. (3) (3 lectures and one 3-hour lab) Study and analysis of machines for tillage, harvesting, crop processing and handling. Field tests, load studies, design requirements; design of machines and components for agricultural applications.

● ★ **ABEN 416 ENGINEERING FOR LAND DEVELOPMENT.** (3) (3 lectures and one 2-hour lab or design problems) (Prerequisite: ABEN 217)

ABEN 418 SOIL MECHANICS AND FOUNDATIONS. (3) (3 lectures and one 3-hour lab) (Prerequisite: ABEN 341) The exploration of subsoils, strength theories, granular and cohesive soils, foundation design, settlement calculation, consolidation, slope stability, Atterberg limits, triaxial testing, direct shear testing, compaction, soil freezing, frost heaving.

★ **ABEN 419 STRUCTURAL DESIGN.** (3) (3 lectures and one 3-hour lab or design problems) (Prerequisites: ABEN 341) Structural Design in steel and timber; application of complete design procedures to working stress design; plastic design for ultimate loading.

ABEN 490 DESIGN 1. (2) (1 lecture) (Prerequisite: ABEN 315) The student is expected to develop a professional design project proposal with due considerations to executive summary, synthesis, methodology, milestones, budget, etc.

ABEN 491D1 UNDERGRADUATE SEMINAR 1. (0.5) (Students must also register for ABEN 491D2) (No credit will be given for this course unless both ABEN 491D1 and ABEN 491D2 are successfully completed in consecutive terms) Attendance and participation in departmental seminars.

ABEN 491D2 UNDERGRADUATE SEMINAR 1. (0.5) (Prerequisite: ABEN 491D1) (No credit will be given for this course unless both ABEN 491D1 and ABEN 491D2 are successfully completed in consecutive terms) See ABEN 491D1 for course description.

May also be available as: ABEN 491N1, ABEN 491N2.

ABEN 492D1 UNDERGRADUATE SEMINAR 2. (0.5) (Students must also register for ABEN 492D2) (No credit will be given for this course unless both ABEN 492D1 and ABEN 492D2 are successfully completed in consecutive terms) Attendance and participation in departmental seminars.

ABEN 492D2 UNDERGRADUATE SEMINAR 2. (0.5) (Prerequisite: ABEN 492D1) (No credit will be given for this course unless both ABEN 492D1 and ABEN 492D2 are successfully completed in consecutive terms) See ABEN 492D1 for course description.

May also be available as: ABEN 492N1, ABEN 492N2.

ABEN 495 DESIGN 2. (3) (1 lecture) (Prerequisite: ABEN 490) The student is expected to implement, physically or virtually, the project proposed in the Design 1 course. The student is expected to present project outcome, in both written and oral forms and learn to be critical about their own work and those of others.

● **ABEN 500 ADVANCED APPLICATIONS: COMPUTING IN AGRICULTURE.** (3) (3 lectures and one 2-hour lab) (Prerequisite: ABEN 251 or ABEN 252)

ABEN 504 INSTRUMENTATION AND CONTROL. (3) (3 lectures and one 2-hour lab) (Prerequisite: ABEN 312 or ECSE 281) Principles and operation of instrument systems used for measurement and control in agricultural processes and research.

ABEN 506 ADVANCES IN DRAINAGE MANAGEMENT. (3) (3 weeks intensive course) Land drainage in relation to soils and crops. Design of regional drainage systems, stability of ditches, ice problems. Design of subsurface drainage systems. Theories of flow into

drain tubes. Hydraulics of wells. Drainage of irrigated lands. Water table control.

● **ABEN 509 HYDROLOGIC SYSTEMS AND MODELLING.** (3) (3 hour lectures)

● ★ **ABEN 512 SOIL CUTTING AND TILLAGE.** (3) (2 lectures and one 2-hour lab) (Prerequisite: ABEN 341)

● **ABEN 517 DRAINAGE PROJECT CONTRACTS.** (3) (3 lectures)

★ **ABEN 518 POLLUTION CONTROL FOR AGRICULTURE.** (3) (One 3 hour lecture) Special topics concerning control of pollution agents from the agricultural industry; odour control, agricultural waste treatment including biological digestion, flocculants, land disposal and sedimentation, pesticide transport.

● ★ **ABEN 525 VENTILATION OF AGRICULTURAL STRUCTURES.** (3) (3 lectures and one 3-hour lab) (Prerequisite: ABEN 301)

● ★ **ABEN 530 FERMENTATION ENGINEERING.** (3) (3 lectures and one 3-hour lab) (Prerequisite: ABEN 325 or equivalent)

AEBI – Biology (Agric & Envir Sc)

Offered by: Department of Natural Resource Sciences

Former Teaching Unit Code: 344

AEBI 120 GENERAL BIOLOGY. (3) (Fall) (2 lectures and one 3-hour lab) (Not open to students who have passed CEGEP objective 00UK or equivalent (formerly Biology 301)) An introduction to the structure, function and adaptation of plants and animals in the biosphere.

AEBI 200 BIOLOGY OF ORGANISMS. (3) (Fall) (3 lectures and 1 lab) The major taxonomic divisions of living organisms; the Protozoa with special reference to parasitic forms; animal embryology; a survey of the structure and biology of the major phyla, with emphasis on animal parasites and entomology.

AEBI 202 CELLULAR BIOLOGY. (3) (Winter) (3 hours of lectures per week) Organization and function of intercellular organelles in eukaryotic cells. Protein synthesis and control of protein transport within the cell. Cell division and DNA replication. Energy metabolism and electron transport. Signal transduction and transmembrane signalling. Differentiation of cells and cancer. Function and components of the immune system.

AEBI 205 PRINCIPLES OF ECOLOGY. (3) (Winter) (2 lectures and 1 conference) The interactions of organisms and the physical environment. Ecological principles will be discussed at the level of the individual, the population and the community.

● **AEBI 306 BIOLOGICAL INSTRUMENTATION.** (3) (Two 3-hour labs)

AEBI 495D1 ENVIRONMENTAL BIOLOGY SEMINAR. (1) (Fall) (1 lecture) (Students must also register for AEBI 495D2) (No credit will be given for this course unless both AEBI 495D1 and AEBI 495D2 are successfully completed in consecutive terms) Presentation of papers on, and discussion of, topics from the field of environmental biology.

AEBI 495D2 ENVIRONMENTAL BIOLOGY SEMINAR. (1) (Winter) (Prerequisite: AEBI 495D1) (No credit will be given for this course unless both AEBI 495D1 and AEBI 495D2 are successfully completed in consecutive terms) See AEBI 495D1 for course description.

Also offered as:

AEBI 495N1 ENVIRONMENTAL BIOLOGY SEMINAR. (1) (Winter)

AEBI 495N2 ENVIRONMENTAL BIOLOGY SEMINAR. (1) (Fall)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

AEHM – English (Agric & Envir Sc)

Offered by: Faculty of Agricultural and Environmental Sciences
Former Teaching Unit Code: 348

Entrance/Placement tests for AEHM courses are co-ordinated through the office of the Associate Dean (Student Affairs). Placement tests will take place during the first regularly scheduled meeting of the class. Telephone (514) 398-7718 for further information.

Quebec ESL students must bring copies of CEGEP transcripts. Students who have taken ESL courses for credit at a college or university other than McGill must also bring copies of transcripts. All students are required to attend class without fail during their first two weeks in order to retain their places. Places are assigned on a first come, first served basis.

AEHM 300 ESL: HIGH INTERMEDIATE 1. (3) (3 hours) (Prerequisite: placement test) (Restrictions: open to full-time, non-anglophone students. Not eligible for ESL courses are: 1. non-anglophone students who, for a period of more than four years, have attended secondary institutions (high school and CEGEP) where the primary language of instruction was English, and 2. students who have taken university-level courses judged to be equivalent to the McGill courses AEHM 300 and ESLN 300; AEHM 301 and ESLN 301. These courses are equivalent and mutually exclusive.) (Students too weak in English for AEHM 300 should inquire about the ESLN 200 and ESLN 201 courses offered on the Downtown Campus by the Faculty of Arts.) Improves proficiency of general writing skills while developing reading, oral and aural skills. Focuses on the structure of the English language and the process required to produce coherent short papers. Emphasis on the English of food, agriculture, and the environment.

AEHM 301 ESL: HIGH INTERMEDIATE 2. (3) (3 hours) (Prerequisite: AEHM 300 or placement test) (Restrictions: open to full-time, non-anglophone students. Not eligible for ESL courses are: 1. non-anglophone students who, for a period of more than four years, have attended secondary institutions (high school and CEGEP) where the primary language of instruction was English, and 2. students who have taken university-level courses judged to be equivalent to the McGill courses AEHM 300 and ESLN 300; AEHM 301 and ESLN 301. These courses are equivalent and mutually exclusive.) (Students too weak in English for AEHM 300 should inquire about the ESLN 200 and ESLN 201 courses offered on the Downtown Campus by the Faculty of Arts.) A continuation of AEHM 300. Further improves proficiency of general writing skills while developing reading, oral and aural skills. Focuses on the structure of the English language and the process required to produce coherent short papers. Emphasis on the English of food, agriculture, and the environment.

AEHM 330 ACADEMIC AND SCIENTIFIC WRITING. (3) (3 hours) (Prerequisite: entrance test.) The object of the course is to enable students who have previously mastered the basic elements of written English to produce well-written, well-researched, and well-documented scientific papers for an academic audience.

AEMA – Mathematics (Agric & Envir Sc)

Offered by: Departments of Plant Science and Natural Resource Sciences
Former Teaching Unit Code: 360

AEMA 101 CALCULUS 1. (3) (3 lectures) (Prerequisite: a course in functions) A review of functions and graphs. Limits, continuity, derivatives. Differentiation of elementary functions. Anti-differentiation. Applications.

AEMA 102 CALCULUS 2. (4) (3 lectures) (Prerequisite: Calculus 1 or equivalent) Integration, the indefinite and definite integral. Trapezoidal and Simpson's Rule approximations for the integral. Applications to areas between curves, distance, volume, length of a

curve, work, area of a surface of revolution, average values, moments, etc. Improper integrals and infinite series.

AEMA 202 CALCULUS. (3) (Fall) (3 lectures and 1 conference) Partial differentiation; multiple integrals; vector calculus; infinite series; applications.

AEMA 205 DIFFERENTIAL EQUATIONS. (4) (Winter) (4 lectures; 1 conference hour) (Prerequisite: AEMA 202 or equivalent) Techniques for solution of ordinary 1st and 2nd order equations; power series solutions; systems of equations; introduction to partial differential equations; numerical techniques for solutions; applications to biological, chemical and engineering systems.

AEMA 306 MATHEMATICAL METHODS IN ECOLOGY. (3) (3 hours of lectures per week) (Prerequisite: AEI 205 or permission. Corequisite: AEMA 310 or permission) An introduction to mathematical and graphical tools for use in ecology. Representation and interpretation of data and associated statistics in graphs and tables; theoretical modelling in plant and animal ecology, including difference and differential equation models. Introduction to stability analysis and probability theory. Emphasis is placed on graphical techniques.

AEMA 310 STATISTICAL METHODS 1. (3) (Two 1.5-hour lectures and one 2-hour lab) Measures of central tendency and dispersion; binomial and Poisson distributions; normal, chi-square, Student's t and Fisher-Snedecor F distributions; estimation and hypothesis testing; simple linear regression and correlation; analysis of variance for simple experimental designs.

AEMA 403 ENVIRONMETRICS STAGE. (3) (Limited enrolment: Registration by application - Deadline December 15; the first seven applications received will have priority) (Prerequisite: Permission of the instructor based on satisfactory completion of the U2 year of the Environmetrics Domain in the McGill School of Environment) Summer stage of at least four weeks, including a report. Provides students with professional experience in statistical analyses of environmental data. Can be undertaken at federal or provincial research stations and university research laboratories.

★ **AEMA 411 EXPERIMENTAL DESIGNS.** (3) (2 1.5-hour lectures) (Prerequisite: AEMA 310 or equivalent) (Offered in alternate years with AEMA 414) General principles of experimental design, split-plot designs, spatial heterogeneity and experimental design, incomplete block designs and unbalanced designs, analysis of repeated measures, multivariate and modified univariate analyses of variance, central composite designs.

● ★ **AEMA 414 TEMPORAL AND SPATIAL STATISTICS.** (3) (2 1.5-hour lectures) (Prerequisite: AEMA 310 or equivalent) (Offered in alternate years with AEMA 411)

AEPH – Agricultural Physics

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 338

AEPH 112 INTRODUCTORY PHYSICS 1. (4) (Fall) (3 lectures and one 2-hour lab) Accelerated motion. Newton's Laws. Force, work and energy, power; momentum. Conservation principles. Circular motion. Simple harmonic motion. Waves and sound.

AEPH 114 INTRODUCTORY PHYSICS 2. (4) (Winter) (3 lectures and one 2-hour lab) Electric and magnetic properties of matter: electrostatics, electric currents, the link between electric and magnetic phenomena, geometrical optics, interference diffraction.

AEPH 201 INTRODUCTORY METEOROLOGY. (3) (Fall) (3 lectures) The atmosphere - its properties (structure and motion), and thermodynamics (stability, dry and moist). Clouds and precipitation. Air masses and fronts. Radiation and the global radiation budget. Interactions between the atmosphere and the biosphere.

● **AEPH 303 ADVANCES IN ATOMIC AND NUCLEAR SCIENCE.** (3) (3 lectures and 1 conference)

● **AEPH 405 TRACER TECHNIQUES.** (3) (3 lectures and one 3-hour lab) (Prerequisite: AEPH 303 or equivalent)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

★ **AEPH 510 AGRICULTURAL MICROMETEOROLOGY.** (3) (Fall) (3 lectures) Interaction between plant communities and the atmosphere. The physical processes governing the transfer of heat, mass and momentum as they relate to research and production in agricultural and environmental systems. Experimental techniques for measuring fluxes of heat, water-vapour, CO₂ and natural and man-made pollutants.

AGEC – Agricultural Economics

Offered by: Department of Agricultural Economics
Former Teaching Unit Code: 334

AGEC 200 PRINCIPLES OF MICROECONOMICS. (3) (Fall) (3 lectures) The field of economics as it relates to the activities of individual consumers, firms and organizations. Emphasis is on the application of economic principles and concepts to everyday decision making and to the analysis of current economic issues.

AGEC 201 PRINCIPLES OF MACROECONOMICS. (3) (Winter) (3 lectures) (Prerequisite: AGEC 200 or equivalent) The overall economic system, how it works, and the instruments used to solve social problems. Emphasis will be on decision-making involving the entire economic system and segments of it.

AGEC 230 AGRICULTURAL AND FOOD MARKETING. (3) (Winter) (3 lectures) (Prerequisite: AGEC 200 or equivalent) Marketing principles and practices, their relationship to the agriculture-food system, and the economic impact on all segments of this system. Emphasis on the application of marketing principles in problem-solving and in developing marketing and communication skills of the individual.

AGEC 231 ECONOMIC SYSTEMS OF AGRICULTURE. (3) (Winter) (3 lectures) (Prerequisite: AGEC 200 or equivalent) The structure and organization of Canada's agriculture-food system, the operation, financing, linkages, and functions of its components. Focus to be on management of the various components and the entire system, types of problems confronted now and in the future.

AGEC 242 MANAGEMENT THEORIES AND PRACTICES. (3) (Fall) (3 lectures) An introduction to contemporary management theories and practices in organizations of the food sector.

AGEC 320 ECONOMICS OF AGRICULTURAL PRODUCTION. (3) (Winter) (3 lectures) (Prerequisite: AGEC 200 or equivalent) An intermediate theory course in agricultural economics, dealing with economic concepts as applied to agricultural production and cost functions. Includes theory and application of linear programming as related to production decisions.

AGEC 331 FARM BUSINESS MANAGEMENT. (3) (Fall) (3 lectures) (Prerequisite: AGEC 200 or equivalent) Managing a farm business. Topics include: the decision making process, farm business centre and farm records, farm management and economic concepts, farm planning and budgeting, input management (land, capital, labour and time), tax management (farm organization, estate planning, etc.).

AGEC 333 RESOURCE ECONOMICS. (3) (Fall) (Prerequisites: AGEC 200 or equivalent) The role of resources in the environment, use of resources, and management of economic resources within the firm or organization. Problem-solving, case studies involving private and public decision-making in organizations are utilized.

AGEC 343 ACCOUNTING AND COST CONTROL. (3) (Winter) (3 lectures) An introduction to the basic principles and concepts of responsibility accounting and cost control, analysis and utilization of financial statements and control system data for decision making.

AGEC 344 ENTREPRENEURIAL LEADERSHIP. (3) (Fall) (3 lectures) Leadership concepts and theory, with applications in the context of small and medium-sized organizations. An examination of behaviour models and their relationship to various leadership functions, such as how to set objectives, give praise and instructions, mentor, resolve conflicts, and negotiate.

★ **AGEC 350 AGRICULTURAL FINANCE.** (3) (Winter) (3 lectures) (Prerequisite: AGEC 331) The economic study of acquisition and use of capital in agriculture. Topics include: the analysis of financial statements; farm appraisal; investment analysis; risk in financial management; the cost of capital and the role of financial intermediaries serving agriculture; aggregate financing in agriculture.

★ **AGEC 425 AGRICULTURAL ECONOMETRICS.** (3) (Fall) (3 lectures) (Prerequisites: AEMA 310, AGEC 200 and AGEC 201 or equivalents) Concepts and procedures used in defining and estimating econometric models applied in agriculture. Emphasis on application and estimation of single equation models and solutions to problems such as auto-correlation, heteroscedasticity and multicollinearity. Use of dummy variable technique.

AGEC 430 AGRICULTURE, FOOD AND RESOURCE POLICY. (3) (Winter) (3 lectures) (Prerequisites: AGEC 201 or equivalent, and AGEC 320) Examination of Canadian, North American and international agriculture, food and resource policies, policy instruments, programs and their implications. Economic analysis applied to the underlying principles, procedures and objectives of various policy actions affecting agriculture.

★ **AGEC 440 ADVANCED AGRICULTURE AND FOOD MARKETING.** (3) (Fall) (3 lectures) (Prerequisites: AGEC 201 or equivalent, and AGEC 320) The nature and the economic organization of agricultural and food marketing including the application of economic concepts to problems and procedures, and their impact on Canadian and North American agriculture. Pricing and marketing of principal agricultural products in Canada is examined.

AGEC 442 ECONOMICS OF INTERNATIONAL AGRICULTURAL DEVELOPMENT. (3) (Winter) (3 lectures) (Prerequisites: AGEC 200 or AGEC 201 or equivalent) The course deals with economic aspects of international development with emphasis on the role of food, agriculture and the resource sector in the economy of developing countries. Topics will include, world food analysis, development project analysis and policies for sustainable development. Development case studies will be used.

AGEC 450 AGRICULTURE BUSINESS MANAGEMENT. (3) (Winter) (3 lectures) (Prerequisites: AGEC 230 and AEMA 310) Management of operations in agribusiness firms. The use of computer models to make decisions on output mix, facility location, expansion, inventory management and production and strategy.

AGEC 453 VENTURE CAPITAL OPPORTUNITIES. (3) (Fall) (3 lectures) (Prerequisite: AGEC 343) A course for students in non-business programs to assist them to assist in navigating local financial markets and to obtain financing. The course examines financing for new business, expansion, and specific needs such as seasonal fluctuations, working capital, expanding sales, new product development, management buyouts, and succession planning.

AGEC 491 RESEARCH SEMINAR IN AGRICULTURAL ECONOMICS. (3) (Fall) (3 lectures) (Prerequisites: AGEC 201 or equivalent, and AGEC 320) The nature, methods, and objectives of agricultural economics research concerned with the economic problems affecting the agriculture and food system. Emphasis is on problem identification, and the collection, analysis, and presentation of evidence. Students will present one or more seminars on a research project in agricultural economics.

AGEC 492 SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (3) (Fall, Winter) (Prerequisite: AGEC 201 or equivalent) Students will pursue topics that are not otherwise available in formal courses. An individual course of study will be followed under the supervision of a member of the staff qualified in the appropriate discipline or area.

AGEC 493D1 SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (1.5) (Fall) (Students must also register for AGEC 493D2) (No credit will be given for this course unless both AGEC 493D1 and AGEC 493D2 are successfully completed in consecutive terms) Presentation and discussion of current problems in agricultural economics by staff and/or special guests. This course is offered on an irregular basis under special circumstances.

AGEC 493D2 SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (1.5) (Winter) (Prerequisite: AGEC 493D1) (No credit will be given for

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

this course unless both AGECE 493D1 and AGECE 493D2 are successfully completed in consecutive terms) See AGECE 493D1 for course description.

Also offered as:

AGECE 493N1 SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (1.5) (Winter)

AGECE 493N2 SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (1.5) (Fall)

AGECE 495D1 PROJECT. (1.5) (Fall) (Students must also register for AGECE 495D2) (No credit will be given for this course unless both AGECE 495D1 and AGECE 495D2 are successfully completed in consecutive terms) Under the supervision of a staff member of the Department of Agricultural Economics. Project topic will concern the economics of agriculture, food, or resource development. An agreement between the students and involved staff members must be reached prior to registration.

AGECE 495D2 PROJECT. (1.5) (Winter) (Prerequisite: AGECE 495D1) (No credit will be given for this course unless both AGECE 495D1 and AGECE 495D2 are successfully completed in consecutive terms) See AGECE 495D1 for course description.

Also offered as:

AGECE 495N1 PROJECT. (1.5) (Winter)

AGECE 495N2 PROJECT. (1.5) (Fall)

● **AGECE 503 METHODS OF REGIONAL ANALYSIS.** (3) (Winter) (Prerequisite: AGECE 200) (Not open to students who have taken GEOG 503) Advanced methods of regional economic analysis including analytical, general equilibrium modeling, regional and multiregional input-output models, spatial interaction modelling and methods used to measure localization and urbanization economies.

AGRI – Agriculture

Offered by: Departments of Plant Science and Natural Resource Sciences

Former Teaching Unit Code: 330

AGRI 195 FRESHMAN SEMINAR 1. (0.5) (Fall and Winter) (Restricted to Freshman students.) Members of the Faculty will present seminars on topical issues about their area of research.

AGRI 196 FRESHMAN SEMINAR 2. (0.5) (Fall and Winter) (Restricted to Freshman students) Member of the Faculty will present seminars on topical issues about their area of research.

AGRI 201D1 AGRI-ENVIRONMENT INTERNSHIP. (3) (Students must also register for AGRI 201D2) (No credit will be given for this course unless both AGRI 201D1 and AGRI 201D2 are successfully completed in consecutive terms) Internship on working farms or in other appropriate businesses of the agri-food/environment industries.

AGRI 201D2 AGRI-ENVIRONMENT INTERNSHIP. (3) (Prerequisite: AGRI 201D1) (No credit will be given for this course unless both AGRI 201D1 and AGRI 201D2 are successfully completed in consecutive terms) See AGRI 201D1 for course description.

AGRI 210 AGRO-ECOLOGICAL HISTORY. (3) (3 lectures) Introduction to the environmental consequences of agriculture through time, relating the cultural diversity of agronomic practices to regionally varied ecological processes.

AGRI 220 PROFESSIONAL PRACTICE SEMINAR 1. (0.5) Experiences and responsibilities of Agrologists; legal and ethical aspects of the profession.

AGRI 221 PROFESSIONAL PRACTICE SEMINAR 2. (0.5) Experiences and responsibilities of Agrologists; legal and ethical aspects of the profession.

AGRI 301D1 AGROLOGY INTERNSHIP. (3) (Students must also register for AGRI 301D2) (No credit will be given for this course unless both AGRI 301D1 and AGRI 301D2 are successfully completed in consecutive terms) Agrology internship in industry, government or related fields.

AGRI 301D2 AGROLOGY INTERNSHIP. (3) (Prerequisite: AGRI 301D1) (No credit will be given for this course unless both AGRI

301D1 and AGRI 301D2 are successfully completed in consecutive terms) See AGRI 301D1 for course description.

AGRI 305 BARBADOS AGRO-ECOSYSTEMS. (3) Complexities affecting sustainable agriculture of a small island nation. Social, economic and physical factors that influence environmental choices. Includes lectures at Macdonald campus and a 12-day stay at Belairs, Barbados.

AGRI 320 PROFESSIONAL PRACTICE SEMINAR 3. (0.5) Experiences and responsibilities of Agrologists; legal and ethical aspects of the profession.

AGRI 321 PROFESSIONAL PRACTICE SEMINAR 4. (0.5) Experiences and responsibilities of Agrologists; legal and ethical aspects of the profession.

AGRI 340 PRINCIPLES OF ECOLOGICAL AGRICULTURE. (3) (3 lectures and one 2-hour seminar) (Not open to students who have taken AGRI 250) Focus on low-input, sustainable, and organic agriculture: the farm as an ecosystem; complex system theory; practical examples of soil management, pest control, integrated crop and livestock production, and marketing systems.

AGRI 341 ECOLOGICAL AGRICULTURE SYSTEMS. (3) (2 lectures and 1 conference) (Not open to students who have taken AGRI 430) An overview and presentation of alternative agricultural production systems including low-input, organic, biodynamic, community supported agriculture, the agroecosystem concept, historical overview, ecological basis, key characteristics and functioning, impact of policies, and the transition process.

AGRI 411 INTERNATIONAL AGRICULTURE. (3) (3 lectures and 1 conference) A study of the climate, soils and major economic plant and animal species in tropical and sub-tropical regions; cropping and agro-forestry systems; pest and disease problems; soil and water management; environmental, health and nutrition, and economic issues in rural development; energy and technology for developing countries; the role of international aid and development agencies; case studies on various aspects of food and agricultural systems in developing countries will be presented.

AGRI 420 PROFESSIONAL PRACTICE SEMINAR 5. (0.5) Experiences and responsibilities of Agrologists; legal and ethical aspects of the profession.

AGRI 421 PROFESSIONAL PRACTICE SEMINAR 6. (0.5) Experiences and responsibilities of Agrologists; legal and ethical aspects of the profession.

AGRI 435 SOIL AND WATER QUALITY MANAGEMENT. (3) (Fall) (3 lectures and one 3-hour lab) Management of soil and water systems for sustainability. Cause of soil degradation, surface and groundwater contamination by agricultural chemicals and toxic pollutants. Human health and safety concerns. Water-table management. Soil and water conservation techniques will be examined with an emphasis on methods of prediction and best management practices.

AGRI 480 SPECIAL TOPICS 1. (1)

AGRI 481 SPECIAL TOPICS 2. (2)

AGRI 482 SPECIAL TOPICS 3. (3)

AGRI 490 AGRI-FOOD INDUSTRY PROJECT. (3) Interdisciplinary team project in the agri-food industry.

AGRI 491D1 Co-OP EXPERIENCE. (1.5) (Students must also register for AGRI 491D2) (No credit will be given for this course unless both AGRI 491D1 and AGRI 491D2 are successfully completed in consecutive terms) A co-op experience program of at least 12 weeks duration. Students will be exposed to the main areas of operation of their employer. The cooperating employer and the Instructor (or designate) will develop an individualized co-op experience for each student. Students will be supervised by staff of their employer who will be in contact with the instructor (or designate). A site visit by the Instructor (or designate), a report by the student's employer and a final written and oral report by the student will form the basis for evaluation.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

AGRI 491D2 Co-op EXPERIENCE. (1.5) (Prerequisite: AGRI 491D1) (No credit will be given for this course unless both AGRI 491D1 and AGRI 491D2 are successfully completed in consecutive terms) See AGRI 491D1 for course description.

AGRI 495 SEMINAR AND ASSIGNMENT 1. (1) (Not open to students registered in, or who have taken AGRI 495D1, AGRI 495D2, AGRI 495N1 or AGRI 495N2) Preparation, presentation and discussion of reports upon approved agricultural subjects chosen in consultation with staff members involved in the subject concerned.

AGRI 496 SEMINAR AND ASSIGNMENT 2. (1) (Not open to students registered in, or who have taken AGRI 495D1, AGRI 495D2, AGRI 495N1 or AGRI 495N2) Preparation, presentation and discussion of reports upon approved agricultural subjects chosen in consultation with staff members involved in the subject concerned.

AGRI 550 SUSTAINED TROPICAL AGRICULTURE. (3) (Prerequisites: HISP 218 or equivalent; MATH 203 or AEMA 310 or equivalent) (Restricted Enrolment. Location in Panama. Student must be registered for a full semester of studies in Panama) Contrast theory and practice in defining agricultural environmental "challenges" in the Neotropics. Indigenous and appropriate technological means of mitigation. Soil management and erosion, water scarcity, water over-abundance, and water quality. Explore agro-ecosystem protection via field trips and project designs. Institutional context of conservation strategies, NGO links, and public participation.

ANSC – Animal Science

Offered by: Department of Animal Science
Former Teaching Unit Code: 342

ANSC 234 BIOCHEMISTRY 2. (3) (Winter) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 211) Metabolism in humans and domestic animals. The chemistry of alimentary digestion, absorption, transport, intermediary metabolism and excretion.

ANSC 250 PRINCIPLES OF ANIMAL SCIENCE. (3) (Fall) (3 lectures and one 2-hour lab) Introduction to the scientific principles underlying the livestock and poultry industries. Emphasis will be placed on the breeding, physiology and nutrition of animals raised for the production of food and fibre.

ANSC 251 COMPARATIVE ANATOMY. (3) (Winter) (3 lectures and one 3-hour lab) Study of the macroscopic anatomy of mammals based on detailed dissection of the dog. Comparison with other domestic species will be emphasized.

ANSC 301 PRINCIPLES OF ANIMAL BREEDING. (3) (Winter) (3 lectures and one 2-hour lab) (Prerequisite: AEMA 310 or equivalent) The qualitative and quantitative aspects of genetics as they apply to the economic improvement of domestic mammals and birds. Topics include: animal domestication, animal cytology, Mendelian traits of economic importance, principles of population genetics, statistical tools to describe populations, environmental effects, selection and mating systems.

ANSC 312 ANIMAL HEALTH AND DISEASE. (3) (Winter) (3 lectures and one 2-hour conference) An introduction to the pathogenesis and control of diseases in farm animals. Immune response and other protective mechanisms. Implications of animal diseases and drug therapy for product safety and public health.

ANSC 323 MAMMALIAN PHYSIOLOGY. (4) (Fall) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 211 and one of the following: ANSC 250 or AEBI 202 or equivalent) A study of the organization, functions and regulation of various organ systems in mammals. The nervous, endocrine, muscular, cardiovascular, respiratory, urinary, digestive and reproductive systems are discussed.

ANSC 324 ANIMAL REPRODUCTION. (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisites: ANSC 250, FDSC 211 and ANSC 323) Reproduction in domestic animals integrated with management techniques to improve reproductive efficiency. Laboratory training includes anatomy, semen collection and evaluation, oestrus detection and control, artificial insemination and embryo transfer.

ANSC 330 FUNDAMENTALS OF NUTRITION. (3) (Fall) (3 lectures) (Prerequisite: FDSC 211) A discussion of the nutrients; water, carbohydrates, lipids, proteins, minerals and vitamins, with particular emphasis on their functions in and essentially for the animal organism.

ANSC 424 METABOLIC ENDOCRINOLOGY. (3) (Winter) (3 lectures and one 3-hour lab) (Prerequisite: ANSC 323) A detailed study of the endocrine system and its role in the maintenance of homeostasis in higher vertebrates, including the endocrine regulation of energy balance.

ANSC 433 ANIMAL NUTRITION. (3) (Winter) (3 lectures and one 1-hour lab) (Prerequisites: ANSC 250 and ANSC 330) Critical discussion of nutrient utilization by farm animals, an assessment of nutritive value of feeds. Recent developments in nutritional manipulation are discussed.

ANSC 450 DAIRY CATTLE PRODUCTION. (3) (Fall) (3 lectures and one 2-hour lab) (Prerequisite: ANSC 250) The application and integration of biological principles of genetics, physiology, nutrition and pathology and of economics and engineering for the maximum production efficiency of milk and meat by dairy cattle. Emphasis on recent developments. Trips to dairy farms and related enterprises included as laboratory work.

ANSC 452 BEEF CATTLE AND SHEEP PRODUCTION. (3) (Winter) (3 lectures and one 2-hour lab) (Prerequisite: ANSC 250) The application and integration of biological principles of genetics, physiology, nutrition and pathology and of economics and engineering for the maximum production efficiency of beef and sheep. Trips to beef and sheep farms and related enterprises will comprise part of the laboratory work.

ANSC 454 SWINE PRODUCTION. (3) (Winter) (3 lectures and one 2-hour lab) (Prerequisite: ANSC 250) The application and integration of biological principles of genetics, physiology, nutrition and pathology and of economics and engineering for the maximum production efficiency of swine. Trips to swine farms and related enterprises will comprise part of the laboratory work.

ANSC 455 SPECIAL TOPICS: ANIMAL SCIENCE. (3) (Fall or Winter) Topics that are not otherwise available in formal courses. Investigation of a particular topic will be carried out under the supervision of a staff member who has expertise in the area of study chosen by the student.

ANSC 456 POULTRY PRODUCTION. (3) (Fall) (3 lectures and one 2-hour lab) (Prerequisite: ANSC 250) The application and integration of biological principles of genetics, physiology, nutrition and pathology, and of economics and engineering for the maximum production efficiency of poultry meat and eggs. Trips to poultry farms and related enterprises will comprise part of the laboratory work.

ANSC 460 BIOLOGY OF LACTATION. (3) (Winter) (3 lectures) (Prerequisites: AEBI 202 or equivalent and FDSC 211 or equivalent) An interdisciplinary approach to the study of mammary development, the onset of lactation and its cessation. The course will compare the differences in mammalian species in mammary development from embryological, pre- and post-pubertal and pre- and post-partum aspects. Lactation will be discussed at the cellular and biochemical levels.

ANSC 465 APPLIED INFORMATION SYSTEMS. (3) (Winter) (3 lectures and one 2-hour lab) (Prerequisite: ABEN 251 or demonstrated equivalency) Introduction to concepts of an Information System and subsequent application to various scenarios in agriculture. Industry analysis in terms of users, goals, available data/information, communication, delivery structure, decision making, feedback, exploitation of technology and possible improvements using the Internet. Individual case studies and familiarisation with cutting-edge computer applications.

ANSC 490D1 PROJECT. (1.5) (Fall) (Students must also register for ANSC 490D2) (No credit will be given for this course unless both ANSC 490D1 and ANSC 490D2 are successfully completed in consecutive terms) A project to be completed under the supervision of a staff member of the Department of Animal Science. An agree-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ment between student and the involved staff member must be reached prior to registration.

ANSC 490D2 PROJECT. (1.5) (Winter) (Prerequisite: ANSC 490D1) (No credit will be given for this course unless both ANSC 490D1 and ANSC 490D2 are successfully completed in consecutive terms) See ANSC 490D1 for course description.

Also offered as:

ANSC 490N1 PROJECT. (1.5) (Winter)

ANSC 490N2 PROJECT. (1.5) (Fall)

ANSC 495D1 SEMINAR. (1) (Fall) (1 lecture and 1 lab) (Students must also register for ANSC 495D2) (No credit will be given for this course unless both ANSC 495D1 and ANSC 495D2 are successfully completed in consecutive terms) Instruction on the preparation, presentation and discussion of critical reviews of topics important to animal agriculture to be followed by student presentation of above reviews.

ANSC 495D2 SEMINAR. (1) (Winter) (Prerequisite: ANSC 495D1) (No credit will be given for this course unless both ANSC 495D1 and ANSC 495D2 are successfully completed in consecutive terms) See ANSC 495D1 for course description.

Also offered as:

ANSC 495N1 SEMINAR. (1) (Winter)

ANSC 495N2 SEMINAR. (1) (Fall)

ANSC 501 ADVANCED ANIMAL PRODUCTION SYSTEMS. (3) (Winter) (3 lectures) An advanced course dealing with current world animal production systems (ruminant and monogastric) emphasizing their practices, constraints and relative efficiencies with a view to developing methods of improving productivity.

ANSC 504 POPULATION GENETICS. (3) (Fall) (3 lectures) A consideration of the problems involved in the improvement of animals and the application of genetics in their solution.

ANSC 551 CARBOHYDRATE AND LIPID METABOLISM. (3) (Winter) (3 lectures) Comparative aspects of nutrition and metabolism of carbohydrate and lipid from the cellular level through the multi-organ of the whole organism. Main topics will include biothermodynamics, calorimetry, cellular metabolism and functions of carbohydrate and lipid, digestion, absorption and utilization of dietary carbohydrate and lipid.

ANSC 552 PROTEIN METABOLISM AND NUTRITION. (3) (Fall) (3 lectures) Comparative aspects of nutrition and metabolism of amino acids and proteins from the cellular level on through the multisystem operation of the whole organism. Main topics include cellular metabolism and functions of amino acids and proteins, digestion, absorption and utilization of dietary protein. Comparison between farm animals and humans.

BTEC – Biotechnology

Offered by: Institute of Parasitology
Former Teaching Unit Code: 394

◆ **BTEC 501 BIOINFORMATICS.** (3) (2 lectures and 1 laboratory per week) This course introduces the application of computer software for analysis of biological sequence information. An emphasis is placed on the biological theory behind analytical techniques, the algorithms used and methods of developing a statistical framework for various types of analysis.

BTEC 502 BIOTECHNOLOGY ETHICS AND SOCIETY. (3) (Restricted to U3 and over.) Examination of particular social and ethical challenges posed by modern biotechnology such as benefit sharing, informed consent in the research setting, access to medical care worldwide, environmental safety and biodiversity and the ethical challenges posed by patenting life.

CELL – Genetics

Offered by: Department of Plant Science
Former Teaching Unit Code: 356

CELL 204 GENETICS. (4) (3 lectures, one 3-hour lab, one 1-hour tutorial) The course integrates classical, molecular and population genetics of animals, plants, bacteria and viruses. The aim is to understand the flow of genetic information within a cell, within families and in populations. Emphasis will be placed on problem solving based learning. The laboratory exercises will emphasize the interpretation of genetic experimental data.

● **CELL 500 TECHNIQUES PLANT MOLECULAR GENETICS.** (3)

● **CELL 501 PLANT MOLECULAR BIOLOGY AND GENETICS.** (3)

ENTO – Entomology

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 350

ENTO 352 CONTROL OF INSECT PESTS. (3) (Winter) (Not open to students who have previously taken ENTO 452) (3 lectures) Modern concepts of integrated control techniques and principles of insect pest management, with emphasis on biological control (use of predators, parasites and pathogens against pest insects), population monitoring, and manipulation of environmental, behavioral and physiological factors in the pest's way of life. Physical, cultural, and genetic controls and an introduction to the use of non-toxic biochemical controls (attractants, repellents, pheromones, antimetabolites).

★ **ENTO 440 SYSTEMATIC ENTOMOLOGY.** (3) (Winter) (1 lecture, 1 lab and project) (Prerequisite: NRSC 330) Classification of principal orders, suborders and superfamilies of insects; use of keys; collecting methods.

ENTO 446 APICULTURE. (3)

ENTO 525 INSECT ECOLOGY. (3) (Winter)

★ **ENTO 535 AQUATIC ENTOMOLOGY.** (3) (Winter)

EXTM – Extension Methods

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 352

● **EXTM 300 COMMUNICATIONS-EXTENSION METHODS.** (3) (Weekly 3-hour workshops)

FDSC – Food Science

Offered by: Department of Food Science and Agricultural Chemistry
Former Teaching Unit Code: 333

FDSC 110 INORGANIC CHEMISTRY. (4) (Winter) (3 lectures and one 3-hour lab) The course will be a study of the fundamental principles of atomic structure, valence theory and the periodic table.

FDSC 200 INTRODUCTION TO FOOD SCIENCE. (3) (Fall) (3 lectures) This course enables one to gain an appreciation of the scope of food science as a discipline. Topics include introductions to chemistry, processing, packaging, analysis, microbiology, product development, sensory evaluation and quality control as they relate to food science.

FDSC 211 BIOCHEMISTRY 1. (3) (Fall) (3 lectures) (Corequisite: FDSC 230) Biochemistry of carbohydrates, lipids, proteins, nucleic acids; enzymes and coenzymes. Introduction to intermediary metabolism.

FDSC 212 BIOCHEMISTRY LABORATORY. (2) (Fall) (1 lecture, 1 lab) (Corequisite: FDSC 211) The laboratory use of ionic strength and pH; the chemical properties of carbohydrates, lipids, proteins and

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

enzymes; the instruction of laboratory techniques such as titration, chromatography, the use of the analytical balance and the pH meter.

FDSC 213 ANALYTICAL CHEMISTRY 1. (3) (Fall) (3 lectures and one 3-hour lab) Theoretical aspects of wet chemical techniques including gravimetric and volumetric analyses, redoximetry, and separation techniques.

FDSC 230 ORGANIC CHEMISTRY. (4) (Fall) (3 lectures and one 3-hour lab) Atomic and molecular structure, modern concepts of bonding, overview of functional groups, conformational analysis, stereochemistry, mechanisms and reactions of aliphatic compounds.

FDSC 233 PHYSICAL CHEMISTRY. (3) (Winter) (3 lectures) Introduction to kinetic theory, thermodynamics, properties of liquids and solids, chemical equilibrium and the law of mass action, phase rule, properties of solutions, chemical kinetics.

FDSC 251 FOOD CHEMISTRY 1. (3) (Winter) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 211) A study of the chemistry and functionality of the major components comprising food systems, such as water, proteins, carbohydrates and lipids. The relationship of these components to food stability will be studied in terms of degradative reactions and processing.

FDSC 300 FOOD ANALYSIS 1. (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 251) The theory and methodologies for the analysis of food products for moisture, fat, protein, ash and fibre (proximate analysis). The quantitative aspects of colour measurement and infrared spectroscopy are also developed in relation to the analysis of food systems.

FDSC 305 FOOD CHEMISTRY 2. (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 251) A study of the chemistry and functionality of the minor components comprising food systems, such as enzymes, anthocyanins, carotenoids, additives, vitamins and essential oils. The relationship of these components to food stability in terms of degradative reactions and processing.

FDSC 310 POST HARVEST FRUIT AND VEGETABLE TECHNOLOGY. (3) (Fall) (3 lectures and one 3-hour lab) The post harvest chemistry and physiology of horticultural crops as they affect quality and marketability, handling methods pre and post harvest, principles and practices in cooling, storage, transportation and packaging.

FDSC 315 FOOD ANALYSIS 2. (3) (Winter) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 300) A more detailed treatment on the principal analytical techniques associated with the analysis of carbohydrates, lipids, proteins and vitamin constituents in food systems.

FDSC 319 FOOD CHEMISTRY 3. (3) (Winter) (2 lectures and one 3-hour lab) (Prerequisite: FDSC 305) The relationship between the chemistry of food constituents present in common commodities, such as milk, meat, eggs, cereals, oilseeds etc. and the common processing methodologies associated with their transformation into stable food product.

FDSC 330 FOOD PROCESSING. (3) (Winter) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 251) The principles and practices of food processing with an emphasis on canning, freezing, and dehydration. A survey of the newer methods of food preservation such as irradiation, reverse osmosis etc.

FDSC 334 ANALYTICAL CHEMISTRY 2. (3) (Winter) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 213 or equivalent) Theoretical and practical aspects of potentiometric measurements (pH and other ion-selective electrodes), spectrophotometry, atomic absorption spectroscopy and automated chromatography.

FDSC 400 FOOD PACKAGING. (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisite: FDSC 305) An integrated approach to the materials used for the packaging of food products, considering the physical, chemical and functional characteristics of such materials and their utility, relative to the chemistry of the food system they are designed to enclose and preserve.

FDSC 405 PRODUCT DEVELOPMENT. (3) (Fall) (3 lectures and one 3-hour lab) (Pre-/Co-requisite: FDSC 305) The chemical, techno-

logical and procedural aspects of product development. An understanding of the role and functionality of food ingredients such as acidulants, phosphates, modified starches, gums, emulsifiers, food additives and other functional components in relation to the formulation of food products.

FDSC 410 FLAVOUR CHEMISTRY. (3) (Winter) (3 lectures) (Prerequisite: FDSC 305) The chemistry of the flavour constituents of foods, synthesis, modification, extraction and use.

FDSC 425 PRINCIPLES OF QUALITY ASSURANCE. (3) (Winter) (3 lectures) (Prerequisite: AEMA 310) The principles and practices required for the development, maintenance and monitoring of systems for food quality and food safety. The concepts and practices of Hazard Analysis Critical Control Point; ISO 9000; Total Quality Management; Statistical Sampling Plans, Statistical Process Control; Tools of Quality; Government Regulations.

FDSC 490 RESEARCH PROJECT 1. (3) (Fall or Winter) A course designed to give final year undergraduate students research experience.

FDSC 491 RESEARCH PROJECT 2. (3) (Fall or Winter) (Pre-/Co-requisite: FDSC 490. Registration by Department permission only) A laboratory research project.

FDSC 495D1 FOOD SCIENCE SEMINAR. (1.5) (Fall) (2 lectures) (Students must also register for FDSC 495D2) (No credit will be given for this course unless both FDSC 495D1 and FDSC 495D2 are successfully completed in consecutive terms) Two 20-minute presentations (1 per term) on an assigned or selected topic. The purpose is to research a subject and present to a peer audience the essence of the subject investigated. Development of presentation and communication skills at a professional level is stressed and rapport with the industry will be established through guest speakers.

FDSC 495D2 FOOD SCIENCE SEMINAR. (1.5) (Winter) (Prerequisite: FDSC 495D1) (No credit will be given for this course unless both FDSC 495D1 and FDSC 495D2 are successfully completed in consecutive terms) See FDSC 495D1 for course description.

Also offered as:

FDSC 495N1 FOOD SCIENCE SEMINAR. (1.5) (Winter)

FDSC 495N2 FOOD SCIENCE SEMINAR. (1.5) (Fall)

★ **FDSC 500 FOOD ENZYMOLOGY.** (3) (Winter) (3 lectures) (Pre-/Co-requisite: FDSC 305) (Course offered in odd years. Check with Graduate Advisor.) Enzymes as they pertain to the deteriorative processes, as processing aids and their use as analytical tools in food systems.

★ **FDSC 510 FOOD HYDROCOLLOID CHEMISTRY.** (3) (Winter) (3 lectures) (Prerequisite: FDSC 319. Corequisite: FDSC 305) (Course offered in even years (check with Graduate Advisor)) The concepts of colloid chemistry as it applies to food systems. Components such as proteins, gums, carbohydrates, and emulsions are studied in terms of their chemical and physical properties (i.e., rheology, optical characteristics, etc.) and how they can be used to advantage in food systems.

★ **FDSC 515 ENZYME THERMODYNAMICS/KINETICS.** (3) (Winter) (Prerequisites: FDSC 211 and FDSC 233 or instructor's permission) (Course offered in odd years. Check with Graduate advisor) Selected advanced topics on the biophysical and kinetic aspects of enzymatic reactions, particularly the fundamentals and applications of laws of biothermodynamics, biochemical equilibrium, electrochemistry and biochemical kinetics as related to the enzymatic reactions.

★ **FDSC 519 ADVANCED FOOD PROCESSING.** (3) (Winter) (3 lectures) (Prerequisite: FDSC 330) (Course offered in even years (check with Graduate Advisor)) Advanced technologies associated with food processing studied in more detail. Topics include food irradiation, reverse osmosis, super critical fluid extraction and extrusion.

★ **FDSC 520 BIOPHYSICAL CHEMISTRY OF FOOD.** (3) (Fall) (3 lectures) (Prerequisite: FDSC 233) (Course offered in even years. Check with Graduate Advisor.) This course will cover recent

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

advances in the application of spectroscopic techniques, including infrared, Raman, near-infrared, circular dichroism, and fluorescence spectroscopy, to the study of biomolecules of relevance to food. Particular emphasis will be placed on the molecular basis of structure-function and structure-functionality relationships.

★ **FDSC 530 ADVANCED ANALYTICAL CHEMISTRY.** (3) (Fall) (3 lectures) (Prerequisite: FDSC 213) (Course offered in odd years (check with Graduate Advisor)) Selected instrumental methodologies including advances in automated chromatography, wide band NMR, chemical sensors, and the application of other spectroscopic techniques to the analysis of food constituents.

FDSC 535 FOOD BIOTECHNOLOGY. (3) (Fall) (3 lectures) (Prerequisite: MICR 230) Developments in biotechnology as it relates to food production and processing concerning traditional food fermentations as well as novel food biotechnology enzymes, ingredients, genetic engineering, plant tissue culture and developments for microbiological and food analysis.

MICR – Microbiology (Agric & Envir Sc)

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 362

MICR 200 LABORATORY METHODS IN MICROBIOLOGY. (3) (Fall) (Two 3-hour labs) A practical application of techniques relating to morphology and physiology, enrichment, isolation and identification of selected classes of microorganisms.

MICR 230 MICROBIAL WORLD. (3) (Winter) (3 lectures and one 3-hour lab) The occurrence and importance of microorganisms (especially bacteria) in the biosphere. Principles governing growth, death and metabolic activities of microorganisms. An introduction to the microbiology of soil, water, plants, food, man and animals.

MICR 331 MICROBIAL ECOLOGY. (3) (Winter) (Not open to students who have successfully completed NRSC 331) Aspects of microbial ecology and environmental microbiology ecology and environmental microbiology will be studied, emphasizing the underlying microbial genetics and physiology. Microbial interactions, diversity, evolution (the position of microorganisms in the universal phylogenetic tree), and the roles of microbes in biogeochemical cycles, biodegradation, and bioremediation will be discussed.

MICR 337 FRONTIERS IN MICROBIOLOGY. (1) (Fall and Winter) This course involves the preparation of a comprehensive term paper based on a search of the literature on a topic assigned to include an area of recent development new to the student.

● ★ **MICR 338 BACTERIAL MOLECULAR GENETICS.** (3) (Fall) (Prerequisites: FDSC 211 and CELL 204) (Not open to students who have successfully completed NRSC 338.) Basic bacterial genetics, DNA damage and repair, mutagenesis, gene cloning, mapping and regulation, molecular biology. Laboratory sessions will provide the student with practical experience in the genetic manipulation of microbes and in molecular biology techniques.

★ **MICR 341 MECHANISMS OF PATHOGENICITY.** (3) (Fall) (3 lectures, one 3-hour lab) (Prerequisite: MICR 230) A study of the means by which bacteria cause disease in animals and humans. Includes response of host to invading bacteria, bacterial attachment and penetration processes, and modes of actions of exotoxins and endotoxins.

MICR 442 FOOD MICROBIOLOGY AND SANITATION. (3) (Fall) (Prerequisite: MICR 230) (Not open to students who have successfully completed NRSC 442.) Microorganisms, and their products important to the food industry, will be discussed in terms of production of foods, preservation and processing of foods, facility sanitation and waste disposal, and potential for causing food borne disease outbreaks.

MICR 492 RESEARCH PROJECT 1. (2) (Fall and Winter) A research project involving laboratory work. Preparation of a project progress report and a literature review pertinent to the research area.

MICR 493 RESEARCH PROJECT 2. (3) (Fall and Winter) (Not open to students who have successfully completed NRSC 492D,N.) A con-

tinuation of the project begun in MICR 492. Laboratory work, preparation of a project report and journal article, and an oral presentation.

MICR 495 SEMINAR 1. (1) (Fall and Winter) Presentation on a selected topic.

MICR 496 SEMINAR 2. (2) (Fall and Winter) (Not open to students who have successfully completed NRSC 495D,N.) Advanced presentation on a selected topic.

NRSC – Natural Resource Sciences

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 373

Note: NRSC 382, NRSC 383 and NRSC 384 are Macdonald Summer Field Semester courses. For more information, consult the Summer Studies Website at www.mcgill.ca/summer, or the Faculty Website at www.agrenv.mcgill.ca/envschool.

NRSC 300 NATURAL HISTORY OF EAST AFRICA. (3) (Winter) (Limited to students in AFSS) (Corequisite: ANTH 315) Introduction to natural features and ecological interactions involving flora and fauna of East Africa. A science context course taking advantage of the biological opportunities presented by habitats at various locations, examining conservation issues related to these situations.

NRSC 330 INSECT BIOLOGY. (3) (Fall) (2 lectures and one 2-hour lab) An introduction to insect structure, physiology, development, systematics, evolution, ecology and control.

NRSC 340 GLOBAL PERSPECTIVES ON FOOD. (3) (Winter) (3 lectures) (Prerequisite: A 200-level course in food science, food resources or dietetics, or permission of instructor.) Issues of community and global change in relation to environment and the production of food. Contrasts between developed and developing countries will highlight impacts of colonialism, political structures, and cultural systems related to gender, class and ethnicity.

● **NRSC 350 BIOLOGICAL ILLUSTRATION 1.** (3) (2 lectures, 2 hours research/reading and 2 hours tutorial) (Students in Biology or the School of Environment who wish to take this course should see the Arts and Science Student Affairs Office for permission to register.)

● **NRSC 351 BIOLOGICAL ILLUSTRATION 2.** (3) (2 lectures, 2 hours research/reading and 2 hours tutorial) (Prerequisite: Preference for students with NRSC 350 or equivalent)

NRSC 370 SPECIAL TOPICS. (1) (Fall and Winter) (Departmental approval required.) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area.

NRSC 371 SPECIAL TOPICS. (1) (Fall and Winter) (Departmental approval required.) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area.

NRSC 372 SPECIAL TOPICS. (2) (Fall and Winter) (Departmental approval required.) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area.

NRSC 373 SPECIAL TOPICS. (2) (Fall and Winter) (Departmental approval required.) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area.

NRSC 374 SPECIAL TOPICS. (3) (Fall and Winter) (Departmental approval required.) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

NRSC 375 SPECIAL TOPICS. (3) (Fall and Winter) (Departmental approval required.) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area.

NRSC 382 ECOLOGICAL MONITORING AND ANALYSIS. (3) (Summer) Students use a variety of methods to sample physical, biological and human systems, to analyse and interpret these data to assess ecosystem health. Methods include GIS, population sampling, land use, resource and biodiversity mapping.

● **NRSC 383 LAND USE: REDESIGN AND PLANNING.** (3) (Summer) (Prerequisite: 24 credits of university training in a field relating to the environment, including one course in statistics, AEMA 310, or equivalent)

NRSC 384 FIELD RESEARCH PROJECT. (3) (Summer) (Prerequisite: 24 credits of university training in a field relating to the environment, including one course in statistics, AEMA 310, or equivalent. Pre-/co-requisite: NRSC 381) Small group field research project.

NRSC 496D1 PROJECT 1. (1.5) (Fall) (Students must also register for NRSC 496D2) (No credit will be given for this course unless both NRSC 496D1 and NRSC 496D2 are successfully completed in consecutive terms) Development of research techniques through selection of problem, formulation of hypotheses and objectives, research design, review of pertinent literature, experimental work, discussion and conclusion of results with oral presentation of completed report, all in consultation with research director.

NRSC 496D2 PROJECT 1. (1.5) (Winter) (Prerequisite: NRSC 496D1) (No credit will be given for this course unless both NRSC 496D1 and NRSC 496D2 are successfully completed in consecutive terms) See NRSC 496D1 for course description.

Also offered as:

NRSC 496N1 PROJECT 1. (1.5) (Winter)

NRSC 496N2 PROJECT 1. (1.5) (Fall)

NRSC 497D1 PROJECT 2. (2.5) (Fall) (Students must also register for NRSC 497D2) (No credit will be given for this course unless both NRSC 497D1 and NRSC 497D2 are successfully completed in consecutive terms) Development of research techniques through selection of problem, formulation of hypotheses and objectives, research design, review of pertinent literature, experimental work, discussion and conclusion of results with oral presentation of completed report, all in consultation with research director. Similar to NRSC 496, with a more elaborate research program.

NRSC 497D2 PROJECT 2. (2.5) (Winter) (Prerequisite: NRSC 497D1) (No credit will be given for this course unless both NRSC 497D1 and NRSC 497D2 are successfully completed in consecutive terms) See NRSC 497D1 for course description.

Also offered as:

NRSC 497N1 PROJECT 2. (2.5) (Winter)

NRSC 497N2 PROJECT 2. (2.5) (Fall)

● ★ **NRSC 515 PARASITOID BEHAVIOURAL ECOLOGY.** (3) (Winter) (3 lectures and one 2-hour seminar) (Prerequisite: NRSC 330 or equivalent)

NRSC 520 INSECT PHYSIOLOGY. (3) (Fall and Winter) (Prerequisite: Permission of instructor) Organismal approach to insects, emphasizing the physiology and development, and the physiological relations of insects to their environment.

● ★ **NRSC 521 SOIL MICROBIOLOGY AND BIOCHEMISTRY.** (3) (Winter) (Prerequisite: SOIL 210)

NRSC 540 SOCIO-CULTURAL ISSUES IN WATER. (3) (Winter) (Prerequisite: A 300- or 400-level course in water or permission of instructor.) (3-hour seminar) Discussion of current debates and problems related to water, especially in developing countries. Topics include: gender relations and health in the context of cultural and economic systems, and the impacts of new technologies, market structures and population growth.

NRSC 550 VETERINARY AND MEDICAL ENTOMOLOGY. (3) (Winter) (Prerequisite: Permission of instructor) Environmental aspects of veterinary and medical entomology. An advanced course dealing with the biology and ecology of insects and acarines as aetiological

agents and vectors of disease, and their control. Integrated approaches to problem solving.

NUTR – Nutrition and Dietetics

Offered by: School of Dietetics and Human Nutrition

Former Teaching Unit Code: 382

● **NUTR 200 CONTEMPORARY NUTRITION.** (3) (Summer) (Not open for credit to students with a biology or chemistry course in their program, or to students registered in the School of Dietetics and Human Nutrition, or to students who take NUTR 207)

NUTR 207 NUTRITION AND HEALTH. (3) (Fall) (3 lectures) (Corequisites: BIOL 401 or FDSC 230) (Not open to students who take NUTR 200 or NUTR 307 or who have taken PHGY 311 or BIOC 311) (Science students in physical science and psychology programs who wish to take this course should see the Arts and Science Student Affairs Office for permission to register.) Provides students who have a basic biology/chemistry background with the fundamental information on how macronutrients, vitamins and minerals are metabolized in the body, followed by application to evaluate current issues of maximizing health and disease prevention at different stages of the lifecycle.

‡ **NUTR 208 STAGE IN DIETETICS 1.** (1) (Winter) (Prerequisites: all Required courses in Term 1 of the Dietetics Major. Corequisites: All Required courses in Term 2 of the Dietetics Major) (Restricted to Dietetics Major or Special Students (professional credentialing)) Introduction to the dietetics profession; principles and policies in food and nutrition essential to entry-level dietetics experiences; practice in dietary interviewing, problem solving and report writing related to Level 1 Professional Practice placements.

‡ **NUTR 209D1 PROFESSIONAL PRACTICE STAGE 1B.** (1.5) (Summer: 4 weeks) (Prerequisites: all Required courses in Terms 1 and 2 of the Dietetics Major) (Restricted to Dietetics Major or Special Students (professional credentialing)) (Students must also register for NUTR 209D2) (No credit will be given for this course unless both NUTR 209D1 and NUTR 209D2 are successfully completed in consecutive terms) Directed, supervised experiences in nutrition services and food service operations management; integration into the professional team.

NUTR 209D2 PROFESSIONAL PRACTICE STAGE 1B. (1.5) (Fall: 1 - 6 hours) (Prerequisite: NUTR 209D1) (No credit will be given for this course unless both NUTR 209D1 and NUTR 209D2 are successfully completed in consecutive terms) See NUTR 209D1 for course description.

NUTR 214 FOOD FUNDAMENTALS. (3) (Fall) (2 lectures and one 4-hour lab) (Prerequisite: FDSC 230 or corequisite with instructor's permission. Corequisite FDSC 211.) Study of composition, structure and chemical and physical properties of foods. To understand the scientific principals underlying chemical and physical phenomena that occur during the preparation of food. Laboratory emphasis on developing skills in handling and preparing food, and food assessment by sensory evaluation.

NUTR 217 APPLICATION: FOOD FUNDAMENTALS. (3) (Winter) (2 lectures and one 4-hour lab) (Prerequisite: NUTR 214) A more intensive study of food and complex food mixtures, including their chemical and physical properties. Learning how to control the changes that take place during the preparation of food to obtain palatable, nutritious and safe food. An introduction to culturally determined food habits. Laboratory emphasis on acquiring new knowledge and application to basic food preparation and cooking principles.

NUTR 301 PSYCHOLOGY. (3) (Fall) (2 lectures and 1 conference) A study of the general characteristics of physical, social, emotional and intellectual development, the psychology of learning, and the growth and development of personality.

NUTR 307 HUMAN NUTRITION. (3) (Fall) (Prerequisites: BIOL 201 or AEBI 202, CHEM 212 or FDSC 230 or permission of the instructor.) (Not open to students who have taken ANSC 330) (3 lecture

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

hours) Cellular and organismal aspects of nutrition with emphases on biochemical and physiological roles of carbohydrates, lipids, proteins, minerals and vitamins in disease prevention and promotion of optimal health.

‡ **NUTR 310 STAGE IN DIETETICS 2A.** (1) (Winter) (One 2-hour conference/week) Human food intake assessment and evaluation will be practiced including modules on dietary interviewing, nutrition education teaching plans and documentation for the medical record. Practical aspects of health and food service administration will be addressed.

‡ **NUTR 311 STAGE IN DIETETICS 2B.** (5) (Summer: 7 weeks) Two interrelated modules of directed experience in normal and clinical nutrition and foodservice management, in health care settings and the private sector.

NUTR 322 APPLIED SCIENCES COMMUNICATION. (2) (Fall) (2 lectures, 1 lab) (Prerequisite: Completion of 15 credits in a B.Sc. program) The principles and techniques of communicating applied sciences to individuals and groups in both the professional and public milieu. Effective public speaking and group interaction techniques. Communication materials selection, development, use, and evaluation. Writing for the media. Balancing risk and reason in communicating scientific findings.

NUTR 337 NUTRITION THROUGH LIFE. (3) (Winter) (3 lectures, 1 conference) (Prerequisite: ANSC 330 or NUTR 307) Emphasis on applied quantitative aspects of human nutrition. Nutrient utilization, evaluation and requirements, as related to dietary standards.

NUTR 344 CLINICAL NUTRITION 1. (4) (Winter) (Two 2-hour lectures) (Pre-/Co-requisite: ANSC 323, NUTR 337) Clinical nutrition assessment and dietary modification of pathological conditions including hypertension, lipid disorders and cardiovascular disease, obesity, diverticulosis, cancer, COPD, anorexia nervosa and bulimia.

NUTR 345 FOOD SERVICE SYSTEMS MANAGEMENT. (2) (Fall) An introductory course applying the principles of organizational management within the healthcare foodservice industry. Emphasis on understanding standards of quality control, customer relations and sanitation. Budget preparation, scheduling and cost control as well as menu preparation, recipe standardization and costing.

NUTR 346 QUANTITY FOOD PRODUCTION. (2) (Winter) (Prerequisite: NUTR 345) Quantity food planning, costing, and evaluation. Laboratory experience with quantity food production following principles of food sanitation and safety, food quality and cost-evaluation.

NUTR 403 NUTRITION IN SOCIETY. (3) (Fall) (3 hour conference) (Prerequisite: NUTR 337) Sociocultural and economic influences on food choice and behaviour; health promotion and disease prevention through nutrition, particularly in high risk populations; the interaction of changing environment, food availability and quality as they affect health.

‡ **NUTR 409 STAGE IN DIETETICS 3.** (8) (Winter: 10 weeks) Four interrelated modules of directed experience in clinical nutrition, foodservice management, normal nutrition education and community nutrition, in health care settings and the private sector.

NUTR 420 TOXICOLOGY AND HEALTH RISKS. (3) (Fall) (3 lectures) (Prerequisite: FDSC 211, BIOL 201 or BIOC 212) (This course is not open to students who have taken NUTR 361) Basic principles of toxicology, health effects of exposure to environmental contaminants such as heavy metals, pesticides and radionuclides and ingestion of food toxicants such as food additives and preservatives; natural toxins in plants and marine foods, human health, ecosystem health, safety evaluation, risk assessment, and current Canadian regulations.

NUTR 430 DIRECTED STUDIES: DIETETICS AND NUTRITION 1. (3) (Fall and Winter) An individualized course of study in dietetics/human nutrition under the supervision of a staff member with expertise on a topic not otherwise available in a formal course. A written agreement between student and staff member must be made before registration and filed with the Program Coordinator.

● **NUTR 431 DIRECTED STUDIES: DIETETICS AND NUTRITION 2.** (3)

NUTR 431D1 DIRECTED STUDIES: DIETETICS AND NUTRITION 2. (1.5) (Students must also register for NUTR 431D2) (No credit will be given for this course unless both NUTR 431D1 and NUTR 431D2 are successfully completed in consecutive terms) (NUTR 431D1 and NUTR 431D2 together are equivalent to NUTR 431) An individualized course of study in dietetics/human nutrition under the supervision of a staff member with expertise on a topic not otherwise available in a formal course. A written agreement between student and staff member must be made before registration and filed with the Program Coordinator.

NUTR 431D2 DIRECTED STUDIES: DIETETICS AND NUTRITION 2. (1.5) (Prerequisite: NUTR 431D1) (No credit will be given for this course unless both NUTR 431D1 and NUTR 431D2 are successfully completed in consecutive terms) (NUTR 431D1 and NUTR 431D2 together are equivalent to NUTR 431) See NUTR 431D1 for course description.

May also be available as: NUTR 431N1 and NUTR 431N2

● **NUTR 432 DIRECTED STUDIES: DIETETICS AND NUTRITION 3.** (3) (Fall and Winter)

NUTR 433 DIRECTED STUDIES: DIETETICS AND NUTRITION 4. (5) (Fall and Winter and Summer) (Limited enrolment) (Prerequisite: registration in NUTR 409 or equivalent. Restricted to students in the Dietetics Major or documentation of requirement for professional registration) An individualized course of study in dietetics and human nutrition not available through other courses in the School. Emphasis will be placed on application of foods and nutrition knowledge, analytic and synthesis skills, and time management. A written agreement between student and instructor must be made before registration. A "C" grade is required to pass the course.

NUTR 436 NUTRITIONAL ASSESSMENT. (2) (Winter) (Prerequisite: NUTR 337) (2 lectures) An intense 4-week course focused on resolving clinically based case studies. The objectives: to develop skills in clinical problem solving, learn principles and methods for assessing the nutritional status of patients and to become skilled at interpreting clinical data relevant to assessing nutritional status and prognosis of hospitalized patients.

NUTR 438 INTERVIEWING AND COUNSELLING. (2) (Winter) (One 2-hour conference) (Prerequisite: NUTR 344 and NUTR 311) Theories of behaviour change. Techniques and skills as applicable to the dietician's role as communicator, interviewer, counsellor, educator, motivator and nutrition behaviour change specialist.

NUTR 445 CLINICAL NUTRITION 2. (5) (Fall) (Two 2.5-hour lectures) (Prerequisite: NUTR 344 and NUTR 424) Clinical nutrition intervention for gastrointestinal and liver disease, hypermetabolic states, diabetes mellitus, renal disease and inborn errors of metabolism, enteral/parenteral nutrition management.

NUTR 446 APPLIED HUMAN RESOURCES. (3) (Fall) (3 lectures, 1 conference) (Prerequisite: AGEC 242) The management of people at work. Employee development and the leadership role. The nature of collective bargaining, the role of unions and management.

NUTR 450 RESEARCH METHODS: HUMAN NUTRITION. (3) (Fall) (2 lectures, 3 hours research, 4 hours other) (Prerequisite: NUTR 337, AEMA 310 or BIOL 373) Introduction to methods of clinical, community, international, and laboratory-based nutrition research. Lectures, readings and assignments will cover basic research concepts. Students undertake a computer directed literature search and analysis.

NUTR 451 ANALYSIS OF NUTRITION DATA. (3) (Fall) (Prerequisite: NUTR 337. Corequisite: NUTR 450) An applied course in analysis and interpretation of nutrition data sets. Introduction to specialized dietary and anthropometric computer programs. Written and oral presentation of results.

NUTR 501 NUTRITION IN DEVELOPING COUNTRIES. (3) (Fall) (2 lectures and one seminar) (Prerequisite: consent of instructor) This course will cover the major nutritional problems in developing countries. The focus will be on nutrition and health and emphasize young children and other vulnerable groups. The role of diet and disease for each major nutritional problem will be discussed.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

NUTR 510 PROFESSIONAL PRACTICE - STAGE 4. (14) (Fall) (Prerequisite: NUTR 409) (Restriction: Not open to students who have taken NUTR 410) (Restriction: Undergraduate registration is restricted to students in the Dietetics Major, CGPA greater than, or equal to 2.50) Interrelated modules of directed experience in clinical nutrition, foodservice management, nutrition education and community nutrition, in health care setting and in the private sector.

★ **NUTR 511 NUTRITION AND BEHAVIOUR.** (3) (2 lectures and one seminar) (Prerequisite: NUTR 445 for undergraduate students or consent of instructor)

NUTR 512 HERBS, FOODS AND PHYTOCHEMICALS. (3) (3 lectures and a project) (Prerequisite: FDSC 211 or BIOL 201 or BIOC 212) An overview of the use of herbal medicines and food phytochemicals and the benefits and risks of their consumption. The physiological basis for activity and the assessment of toxicity will be presented. Current practices relating to the regulation, commercialization and promotion of herbs and phytochemicals will be considered.

PARA – Parasitology

Offered by: Institute of Parasitology
Former Teaching Unit Code: 391

PARA 400 EUKARYOTIC CELLS AND VIRUSES. (3) (4 hours of lectures per week) (Prerequisite: CELL 204) The basic principles of molecular biology and the underlying molecular basis for various methodologies in molecular biology are covered. The molecular genetic basis for viral infections and tumorigenesis will be covered as examples of the use of molecular genetic approaches to address biological problems.

PARA 410 ENVIRONMENT AND INFECTION. (3) (2 lectures per week) (Prerequisite: BIOL 111 or AEBI 120 or equivalent) Infectious pathogens of humans and animals and their impact on the global environment are considered. The central tenet is that infectious pathogens are environmental risk factors. The course considers their impact on the human condition and juxtaposes the impact of control and treatment measures and environmental change.

PARA 438 IMMUNOLOGY. (3) (2 lectures per week) (Prerequisite: AEBI 202 or permission of instructor) An in-depth analysis of the principles of cellular and molecular immunology. The emphasis of the course is on host defense against infection and on diseases caused by abnormal immune responses.

PLNT – Plant Science

Offered by: Department of Plant Science
Former Teaching Unit Code: 367

PLNT 201 COMPARATIVE PLANT BIOLOGY. (3) (3 lectures plus 1-hour conference) Comparative study of the ways in which photosynthetic organisms acquire resources, develop and grow, reproduce, and interact with various groups of fungi and herbivores. Comparisons will be made among the following major groups: cyanobacteria, algae, liverworts, mosses, seedless vascular plants, gymnosperms, and angiosperms.

● **PLNT 205 INTRODUCTORY PLANT PATHOLOGY.** (3)

PLNT 211 PRINCIPLES OF PLANT SCIENCE. (3) (3 lectures and one 2-hour lab) A study of major world crop species with emphasis on their adaptation and distribution in relation to the economic botany of the plants.

● **PLNT 215 ORIENTATION IN PLANT SCIENCE.** (1)

PLNT 220 INTRODUCTION TO VASCULAR PLANTS. (1) (Four 4-hour field labs plus project, given during the first 4 weeks of semester) (First 4 weeks of term only) Field survey of different habitats to introduce major groups of vascular plants (ferns, horsetails, club-mosses, gymnosperms, and flowering plants) in natural environments and demonstrate their role in the ecosystem. Emphasis on differences among groups as reflected in their classification.

PLNT 221 INTRODUCTION TO FUNGI. (1) (Four 4-hour field labs, given during the second 4 weeks of semester) (Second 4 weeks of term only) Field and laboratory survey of local representatives of the major groups of fungi, including edible and poisonous mushrooms. The role of each group in terrestrial and aquatic ecological niches will be studied with respect to saprophytism, parasitism and symbiosis. Economic importance of fungi in medicine and biotechnology will be introduced.

PLNT 300 CROPPING SYSTEMS. (3) (3 lectures and one 3-hour lab) (Prerequisite: PLNT 211) Application of plant science and soil science to production of agronomic and horticultural crops. Use and sustainability of fertilization, weed control, crop rotation, tillage, drainage and irrigation practices.

● **PLNT 304 BIOLOGY OF FUNGI.** (3) (3 lectures and one 3-hour lab)

PLNT 305 PLANT PATHOLOGY. (3) (3 lectures and one 3-hour lab) The theory and concepts of plant pathology, including the disease cycle, infection, symptoms, resistance, epidemiology and control. The biology and taxonomy of pathogens will be studied, including fungi, bacteria, viruses and nematodes. Techniques of inoculation, isolation of pathogens from diseased plants, disease diagnosis and pathogen identification will be demonstrated.

PLNT 310 PLANT PROPAGATION. (3) (3 lectures and one 3-hour lab) Principles and practical aspects of plant propagation are examined. The course consists of two parts. The first third deals with sexual propagation; the production, processing storage certification and analysis of seeds. The remaining two-thirds deals with vegetative propagation; cutting, budding, grafting, layering, and tissue culture.

● **PLNT 321 FRUIT PRODUCTION.** (3) (3 credits; 3 lectures and 1 3-hr lab) (Prerequisite: AEBI 201 or PLNT 211.)

PLNT 322 GREENHOUSE MANAGEMENT. (3) (3 lectures and one 3-hour lab) Greenhouse design and operation, including environmental regulation, fertilization and pest management. Focus will be on the production of major floricultural and vegetable crops.

PLNT 331 FIELD CROPS. (3) (Not open to students who have taken PLNT 333 and/or PLNT 332) (3 lectures and one 3-hour lab period) (Prerequisite: PLNT 211 or PLNT 201) A study of economically important field crops (cereals, forages, oilseeds and crops grown for fibre and other industrial products), historical development, botany, distribution and adaptation, cultural practices and factors that affect the utilization of crop products. Laboratories emphasize morphological study of major field crop species.

PLNT 341 HORTICULTURE - THE ALLIUMS. (1) (Prerequisite: PLNT 211 or PLNT 201 or permission of instructor) An independent study course in CD-ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of the Alliums. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments.

● **PLNT 342 HORTICULTURE - COLE CROPS.** (1) (Prerequisite: PLNT 211 or PLNT 201 or permission of instructor)

PLNT 343 HORTICULTURE - ROOT CROPS. (1) (Prerequisite: PLNT 211 or PLNT 201 or permission of instructor) An independent study course in CD-ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of root crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments.

PLNT 344 HORTICULTURE - SALAD CROPS. (1) (Prerequisite: PLNT 211 or PLNT 201 or permission of instructor) An independent study course in CD-ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of salad crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments.

PLNT 345 HORTICULTURE: SOLANACEOUS CROPS. (1) (Prerequisite: PLNT 211 or PLNT 201 or permission of instructor) An independent study course in CD-ROM format. Modules contain an

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

introductory section on crop establishment and a section dealing with the botany, physiology and management of the solanaceous crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments.

PLNT 348 THE BRASSICAS. (1) (Prerequisite: PLNT 211 or PLNT 201 or permission of instructor) An independent study course in CD-ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of Brassicas. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments.

PLNT 353 PLANT STRUCTURE AND FUNCTION. (4) (3 lectures and one 3-hour lab) (Prerequisite: PLNT 211 or PLNT 201) The general anatomy and physiology of vascular plants with emphasis on the cells, tissues, organs and chemical components of plants and the physiological processes associated with their function.

PLNT 358 FLOWERING PLANT DIVERSITY. (3) (2 lectures, one 3-hour lab, plus a 4-day field week held the week preceding the start of classes) (Prerequisites: PLNT 201 or PLNT 211 or ENVR 202 or permission of instructor) Principles of classification and identification of flowering plants and ferns, with emphasis on 35 major families of flowering plants and the habitats in which they grow.

PLNT 361 PEST MANAGEMENT AND THE ENVIRONMENT. (3) (3 lectures) Pests, pest impacts on the global food system and strategies for pest management. Pest management methods, models and programs, and how to reduce pest management impacts on the environment.

PLNT 421 LANDSCAPE PLANT MATERIALS. (3) (2 lectures and one 3-hour lab) (Prerequisites: PLNT 211 or PLNT 201) A study of the major types of woody and herbaceous ornamental plants used in landscaping and how the landscaping industry uses plants to improve the environment. Laboratory includes a specimen collection of landscape plants widely used in Québec.

PLNT 434 WEED BIOLOGY AND CONTROL. (3) (3 lectures and one 3-hour lab) (Prerequisite: PLNT 211 or PLNT 201) A study of the biology of undesirable vegetation as related to the principles of prevention and physical, biological, managerial and chemical control. Emphasis on the environmental impact of the different methods of weed control.

PLNT 450 SPECIAL TOPICS: PLANT SCIENCE. (2) A course of independent study by the student with the guidance of a professor of recognized competence in the area of the chosen topic.

PLNT 451 SPECIAL TOPICS: PLANT SCIENCE 2. (3) A course of independent study by the student with the guidance of a professor of recognized competence in the area of the chosen topic.

● **PLNT 458 FLOWERING PLANT SYSTEMATICS.** (3) (1 lecture plus one 3-hour lab plus required summer plant collection) (Prerequisite: PLNT 358 or BIOL 358 or permission of instructor)

PLNT 460 PLANT ECOLOGY. (3) (3 lectures and one 3-hour lab) (Prerequisite: AEMA 310 or permission of instructor.) Theory and practice of plant ecology with an emphasis on the interaction between patterns and ecological processes and the dynamics, conservation and management of plant populations and communities over a range of temporal and spatial scales.

PLNT 489 PROJECT PLANNING AND PROPOSAL. (1) (Not open to students who have taken PLNT 490D1, PLNT 490D2, PLNT 490N1 or PLNT 490N2.) Preparation of a literature review and research plan for the project course (PLNT 490).

PLNT 490 RESEARCH PROJECT. (2) (Prerequisite: PLNT 489) (Not open to students who have taken PLNT 490D1, PLNT 490D2, PLNT 490N1 or PLNT 490N2.) Directed study on approved research project requiring both oral and written presentation.

PLNT 495 SEMINAR 1. (1) (Restriction: Not open to students registered in, or who have taken PLNT 495D1, PLNT 495D2, PLNT 495N1 or PLNT 495N2)

PLNT 496 SEMINAR 2. (1)

PLNT 525 ADVANCED MICROPROPAGATION. (3) (One 3-hour lecture) A detailed study of the principles and techniques of plant micro propagation. Includes lectures, laboratories, discussion sessions and visits to local laboratories. Evaluation is based on contribution to discussions, laboratory reports and an individualized project.

PLNT 535 PLANT BREEDING. (3) (Prerequisite: CELL 204, PLNT 211, or AGE 210) (Given in alternate years) Principles and practices of plant breeding, including reproduction of crop plants; plant hybridization; sources of genetic variation; selection methods used for self- and cross-pollinated crops and for clonally reproduced crops; breeding for diseases and pest resistance; applications of biotechnology in plant breeding.

SOIL – Soil Science

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 372

SOIL 200 INTRODUCTION TO EARTH SCIENCE. (3) (Winter) (3 lectures, one 3-hour lab) Introductory concepts of geology and geomorphology will be presented including: rocks and minerals, surface deposits, history and structure of the earth.

SOIL 210 PRINCIPLES OF SOIL SCIENCE. (3) (Fall) (3 lectures and one 3-hour lab) Origin, development and classification of soils, biology, chemical and physical properties related to crop production, soil conservation and land use.

SOIL 315 SOIL FERTILITY AND FERTILIZER USE. (3) (Winter) (3 lectures and one lab) (Prerequisite: SOIL 210 or permission of instructor) Plant nutrients in the soil, influence of soil properties on nutrient absorption and plant growth, use of organic and inorganic fertilizers.

● ★ **SOIL 326 SOIL GENESIS AND CLASSIFICATION.** (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisite: SOIL 200 or equivalent)

● ★ **SOIL 331 SOIL PHYSICS.** (3) (Winter) (3 lectures and one 3-hour lab)

SOIL 335 SOIL ECOLOGY AND MANAGEMENT. (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisites: SOIL 210 and AEBI 205) The physical and chemical environment of soil organisms; survey of soil microflora and fauna; processes and optimal agronomic systems of management consistent with the goals of ecological agriculture.

SOIL 410 SOIL CHEMISTRY. (3) (Winter) (1 lecture, 1 tutorial, problem sets) (Prerequisite: SOIL 210 or GEOG 305 or permission of instructor) Soil chemical principles are presented in a series of problem sets covering basic concepts as well as applications to environmental and agricultural situations.

SOIL 490 PLAN GLOBAL DE FERTILISATION INTÉGRÉE. (3) (Ce cours est offert en français) Objectifs du cours: Ce cours de trois jours vise à habilitier les professionnels à concevoir un Plan global de fertilisation intégrée selon les règles de l'art, mises de l'avant par l'Ordre des agronomes du Québec. L'accent est mis sur l'approche-système et le calcul du bilan des éléments fertilisants de la ferme. Les participants apprendront à établir la problématique de l'entreprise et à apporter des solutions correctives à partir d'exemples concrets. La relation conseiller-client, du mandat au suivi, est également abordée avec des exemples pratiques. L'impact de cette stratégie de gestion des ressources d'un agroécosystème est évalué dans une perspective à long terme. Ce cours tient compte des exigences du MEF pour la réalisation du Plan agroenvironnemental de fertilisation (PAEF).

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

WILD – Resource Development

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 375

WILD 333 PHYSICAL AND BIOLOGICAL ASPECTS OF POLLUTION. (3) (Fall) (3 lectures) The environmental contaminants which cause pollution; sources, amounts and transport of pollutants in water, air and soil; waste management.

WILD 350 MAMMALOGY. (3) (Winter) (2 lectures and one 3-hour lab) (Prerequisites: AEBI 200 and ZOO 307) This course focuses on the evolution, classification, ecology and behaviour of mammals and relations between humans and mammals. Also structure, systematics and identification of local and world mammals, as well as field methods will be emphasized.

WILD 375 ISSUES: ENVIRONMENTAL SCIENCES. (3) (Winter) (3 lectures) Principles and trends in global ecology as they pertain to agricultural and natural ecosystems and the impact of environmental change on food production.

★ **WILD 382 FISH AND WILDLIFE PROPAGATION.** (3) (Fall) (2 lectures and field trips) (Enrollment limited to 20) An overview of the care and reproduction of wildlife species in captivity for commercial, scientific, conservation, and educational purposes through field trips, lectures, and class discussions.

WILD 401 FISHERIES AND WILDLIFE MANAGEMENT. (4) (Fall) (3 lectures, one 2-hour lab and one week field laboratory prior to fall term) (Prerequisite: PLNT 358) Principles of fisheries and wildlife management are considered and current practices of research and management are discussed.

WILD 410 WILDLIFE ECOLOGY. (3) (Winter) (3 hours of lectures per week) (Prerequisite: AEBI 205 or permission) Ecological processes and theories in animal populations. Interrelationships among biological processes, biotic and abiotic factors, and life history strategies. Topics include population dynamics, optimization strategies, predation, habitat selection, risks and decision making, and social behaviour. Application of problem-solving approach to wildlife ecology through individual and group work.

WILD 415 CONSERVATION LAW. (2) (Fall) (2 lectures) A study of the various federal, provincial and municipal laws affecting wildlife habitat. Topics include: laws to protect wild birds and animals; the regulation of hunting; legal protection of trees and flowers, sanctuaries, reserves, parks; techniques of acquiring and financing desirable land, property owner rights.

WILD 420 ORNITHOLOGY. (3) (Fall) (3 lectures and occasional field trips) (Prerequisite: ZOO 307 or permission of instructor) Taxonomic relationships and evolution of birds are outlined. Reproduction, migration and population processes of North American birds are examined.

WILD 421 WILDLIFE CONSERVATION. (3) (Winter) (3 lectures) (Not open to students who have taken NRSC 421.) Study of current controversial issues focusing on wildlife conservation. Topics include: animal rights, exotic species, ecotourism, urban wildlife, multi-use of national parks, harvesting of wildlife, biological controls, and endangered species.

WILD 437 ASSESSING ENVIRONMENTAL IMPACT. (3) (Winter) (2 lectures) Theories and procedures of assessing environmental impact. An examination of the environmental impact of existing programs and projects to examine their accuracy in predicting consequences and attenuating undesirable effects.

● ★ **WILD 475 DESERT ECOLOGY.** (3) (Winter) (Field course) (Prerequisites: PLNT 460, ZOO 307, WILD 420) (Enrollment limited to 20)

● **WILD 491 SEMINAR.** (2)

WILD 491D1 SEMINAR. (1) (Fall) (Students must also register for WILD 491D2) (No credit will be given for this course unless both WILD 491D1 and WILD 491D2 are successfully completed in consecutive terms) Includes basic lectures on synthesis and interpretation of multifaceted subjects; preparation and publication of one

semi-technical article; participation in two oral presentations of technical subjects all under the supervision of academic or staff advisor.

WILD 491D2 SEMINAR. (1) (Winter) (Prerequisite: WILD 491D1) (No credit will be given for this course unless both WILD 491D1 and WILD 491D2 are successfully completed in consecutive terms) See WILD 491D1 for course description.

Also offered as:

WILD 491N1 SEMINAR. (1) (Winter)

WILD 491N2 SEMINAR. (1) (Fall)

WOOD – Woodland Resources

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 374

★ **WOOD 300 URBAN FORESTS AND TREES.** (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisites: PLNT 201 and SOIL 210) The effects of environmental factors such as soil fertility, soil contamination and compaction, extremes of temperature and air pollutants on trees and forests growing in an urban environment, and means to increase their tolerance will be discussed. Emphasis in the laboratory will be on diagnosis and solving of tree problems in urban environments.

WOOD 410 THE FOREST ECOSYSTEM. (3) (Fall) (3 lectures and one 3-hour lab) (Prerequisites: PLNT 201 and SOIL 210 or permission of instructor) Interactions among biotic and abiotic components of forests, and their direct and indirect control of productivity and nutrient cycling in forest ecosystems. The laboratory involves a series of 3-hour field trips to local forests during September and October, followed by analysis of data collected.

WOOD 420 ENVIRONMENTAL ISSUES: FORESTRY. (3) (Winter) (3 lectures and one 2-hour tutorial) (Prerequisites: PLNT 201 and SOIL 210 or permission of instructor) The science behind current environmental issues relating to forests including the effects of management on productivity and biodiversity, conservation of old-growth forests and endangered species, pesticide use, and industrial pollution. The role of scientific knowledge, relative to social and economic forces, in forest resource decision-making is discussed.

WOOD 441 INTEGRATED FOREST MANAGEMENT. (3) (Winter) (3 lectures and one 3-hour lab) (Prerequisite: AEBI 205 or permission of instructor) The study of silviculture and silvics and their application to forest management to sustain the production of wood and other resources such as wildlife, water and landscape in natural forests and rural environments (agroforestry). Acquisition of practical skills in forest survey and computer simulation of forest growth.

ZOOL – Zoology

Offered by: Department of Natural Resource Sciences
Former Teaching Unit Code: 349

ZOOL 307 NATURAL HISTORY OF VERTEBRATES. (3) (Fall) (Lectures and modules) Review of higher taxonomic groups of vertebrates and prochordates, emphasizing diagnostic characters evolution and distribution.

ZOOL 311 ETHOLOGY. (3) (Winter) (2 lectures, one 3-hour lab) Invertebrate and vertebrate behaviour; innate behaviour, learning, motivation, agonistic behaviour, rhythms, social organization, mating systems and communication.

★ **ZOOL 312 ZOOLOGICAL SYSTEMATICS AND EVOLUTION.** (3) (Fall) (3 lectures, and assignments) Introduction to animal taxonomy; "the New Systematics"; species concept; variation; speciation; reproductive isolation; evolution; phylogeny; phenetics; zoological nomenclature; methodology, etc.

★ **ZOOL 313 ZOOGEOGRAPHY.** (3) (Winter) (2 lectures, 1 conference and project) (Prerequisite: ZOO 312) Factors affecting the areal, regional and world distribution of animal groups and species, with particular reference to the post-mesozoic fauna; related

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

aspects of evolutionary and phylogenetic theory, e.g., adaptation, mimicry, parallel and convergent evolution, Plate Tectonics, climatic and topographical variation, dispersal.

★ **ZOOL 315 SCIENCE OF INLAND WATERS.** (3) (Fall) (2 lectures and one 3-hour lab) (Prerequisite: Any basic Botany or Zoology course) Nature and history of limnology; divisions of inland waters; properties of fresh water; habitats; zones; nutrient cycles; biota;

adaptations; seasonal variation; distributions; pollution; succession and evolution of fresh water environments. Includes field excursions.

ZOOL 424 PARASITOLOGY. (3) (Winter) (2 lectures and one 3-hour lab) Systematics, morphology, biology and ecology of parasitic protozoa, flatworms, roundworms and arthropods with emphasis on economically and medically important species.

Faculty of Arts

ACOM – Arts Computing

Offered by: Arts - Dean's Office
Former Teaching Unit Code: 100

ACOM 150 ELEMENTARY COMPUTING. (3) (Prerequisites: None) (Not open to Science, Management, or Engineering students, or Arts students registered in Computer Science programs, or in Mathematics and Computer Science programs) (Credit will not be given for ACOM 150 if taken concurrently with or after COMP 100, COMP 102, COMP 202, COMP 203, COMP 208, COMP 250, EDPT 200 or MGCR 331.) (For syllabus and further details refer to ulla.mcgill.ca/arts150) Introduction to Information Technology (IT) and the digital representation of numerical, verbal and sensory phenomena. The history and impact of IT and its implications. Basic concepts of computing systems. Hands-on experience with computer applications in laboratory sessions.

AFRI – African Studies

Offered by: African Studies Program Committee
Former Teaching Unit Code: 111

● **AFRI 480 SPECIAL TOPICS.** (3) (Prerequisite: the completion of all available courses relevant to the topic, and permission of the instructor and Program Coordinator prior to registration)

AFRI 481 SPECIAL TOPICS. (3) (Prerequisite: the completion of all available courses relevant to the topic, and permission of the instructor and Program Coordinator prior to registration) Supervised reading in advanced special topics in African Studies under the direction of a member of staff.

AFRI 598 RESEARCH SEMINAR IN AFRICAN STUDIES. (3) (Prerequisite: an introductory course in any of the disciplines studying Africa) (Open to final year Program students, and to others by permission of Program Coordinator) An interdisciplinary research seminar on topics of common interest to staff and students of the African Studies Program. As part of their contribution, students will prepare a research paper under the supervision of one or more members of staff.

ANTH – Anthropology

Offered by: Department of Anthropology
Former Teaching Unit Code: 151

First level courses (200-level) are normally taken during the first year of study in Anthropology and are open to all University students. There are no prerequisites for this group of courses. Under no circumstances will pre-university courses be considered as equivalent to first level courses offered by the Department.

Core courses (350 level) are **restricted to Anthropology program students in U-2 standing or above.**

Prerequisites

Intermediate courses: One Anthropology course which is, in some cases, specified, or permission of instructor.

Advanced courses: At least one 300-level Anthropology course which is, in some cases, specified.

Joint graduate – advanced undergraduate courses: permission of instructor.

Prior to registering for a reading course, students **must** meet with the instructor.

ANTH 201 PREHISTORIC ARCHAEOLOGY. (3) (Fall) Examination of the origin of cultural behaviour and culture as an adaptive mechanism from the earliest times to the rise of the first civilizations in the Old and New Worlds. The implications of these data concerning the nature of humans and their future development will be considered.

ANTH 202 COMPARATIVE CULTURES. (3) (Fall) An introduction to cultures and societies around the world. Aspects of social life, such as generation and gender, family and kinship, economics, politics, and religion, are explored. Different ways of life, such as those centered on hunting and gathering, horticulture, pastoralism, agriculture, urbanism, and industrialism, are illustrated and compared.

ANTH 203 HUMAN EVOLUTION. (3) (Winter) An examination of evolutionary theory and the fossil and archaeological record for human origins, emphasizing the interaction between physical and cultural evolution. The use of primate behaviour in reconstructing early human behaviour. The origin and meaning of human variation.

ANTH 204 SYMBOL SYSTEMS AND IDEOLOGIES. (3) (Winter) Through the analysis of language, symbols and cultural constructions of meaning, this course explores how people in different societies make sense of their world, and the ways in which they organise that knowledge, and how ideologies represent the different interests present in a society.

● **ANTH 205 CULTURES OF THE WORLD.** (3)

ANTH 206 ENVIRONMENT AND CULTURE. (3) (Winter) Introduction to ecological anthropology, focusing on social and cultural adaptations to different environments, human impact on the environment, cultural constructions of the environment, management of common resources, and conflict over the use of resources.

ANTH 209 ANTHROPOLOGY OF RELIGION. (3) (Fall) Nature and function of religion. Systems of belief; the interpretation of ritual. The relation of religion to social organization. Religious change.

ANTH 212 ANTHROPOLOGY OF DEVELOPMENT. (3) (Winter) Processes of developmental change, as they affect small communities in the Third World and in unindustrialized parts of developed countries. Problems of technological change, political integration, population growth, industrialization, urban growth, social services, infrastructure and economic dependency.

ANTH 227 MEDICAL ANTHROPOLOGY. (3) (Fall) Beliefs and practices concerning sickness and healing are examined in a variety of Western and non-Western settings. Special attention is given to cultural constructions of the body and to theories of disease causation and healing efficacy. Topics include international health, medical pluralism, transcultural psychiatry, and demography.

● **ANTH 301 NOMADIC PASTORALISTS.** (3) (Prerequisite: ANTH 202, or ANTH 205, or ANTH 206, or ANTH 212)

ANTH 302 NEW HORIZONS IN MEDICAL ANTHROPOLOGY. (3) (Prerequisite: ANTH 227) (Restricted to Anthropology Major Con., Honours, and Jt. Honours students.) Using recent ethnographies as textual material, this course will cover theoretical and methodological developments in medical anthropology since the early 1990's. Topics include a reconsideration of the relationship between culture and biology, medical pluralism revisited, globalization and

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health and disease, and social implications of new biomedical technologies.

● **ANTH 306 NATIVE PEOPLES' HISTORY IN CANADA.** (3) (Prerequisites: HIST 202 or HIST 203 or ANTH 202 or ANTH 205 or ANTH 206, or permission of instructor)

ANTH 312 ZOOARCHAEOLOGY. (3) (Fall) (Prerequisites: ANTH 201 and Honours/Major status in Anthropology) A systematic investigation into current methodological and theoretical concerns in archaeological faunal analysis. Topics to be examined include sampling and quantification, butchery, seasonality, subsistence, taphonomy, and paleoecology.

● **ANTH 313 EARLY CIVILIZATIONS.** (3) (Prerequisite: ANTH 201 or ANTH 202)

● **ANTH 314 PSYCHOLOGICAL ANTHROPOLOGY.** (3) (Prerequisite: ANTH 204 or permission of instructor) (Not open to students who have taken ANTH 214)

ANTH 315 SOCIETY/CULTURE: EAST AFRICA. (3) (Winter) (Open only to students in the Study in Africa program, a full-term field study program in East Africa) Overview of the history, languages and cultures of the region. Examination of the social institutions, cultural patterns, subsistence practices and environmental settings of major social groups, including hunter-foragers, fishers, pastoralists, agro-pastoralists, and cultivators. Discussion of current theoretical and ethnological issues in the study of culture and social change.

ANTH 320 SOCIAL EVOLUTION. (3) (Fall) (Prerequisites: ANTH 202, or ANTH 205, or ANTH 206, or ANTH 212, and Honours/ Major/ Minor status in Anthropology, or permission of instructor) The evolution of human social organization, with a focus on pre-industrial societies (hunter-gatherers, small-scale sedentary societies, complex chiefdoms and small scale states).

● **ANTH 321 PEOPLE AND CULTURES OF AFRICA.** (3) (Prerequisite: ANTH 202, or ANTH 204, or ANTH 205, or ANTH 206, or ANTH 209 or ANTH 212, or permission of instructor)

ANTH 322 SOCIAL CHANGE IN MODERN AFRICA. (3) (Fall) (Prerequisite: ANTH 202, or ANTH 204, or ANTH 205, or ANTH 206, or ANTH 209, or ANTH 212, or ANTH 227 or permission of instructor) The impact of colonialism on African societies; changing families, religion, arts; political and economic transformation; migration, urbanization, new social categories; social stratification; the social setting of independence and neo-colonialism; continuity, stagnation, and progressive change.

● **ANTH 324 ECONOMIC ANTHROPOLOGY.** (3) (Prerequisite: ANTH 202, or ANTH 205, or ANTH 206, or ANTH 212, or permission of instructor)

ANTH 327 PEOPLES OF SOUTH ASIA. (3) (Fall) (Prerequisite: ANTH 202, or ANTH 205, or ANTH 206, or ANTH 212, or permission of instructor) An exploration of the dominant social institutions, cultural themes and perspectives, and psychological patterns found in India and greater South Asia.

ANTH 329 MODERN CHINESE SOCIETY AND CHANGE. (3) (Winter) (Prerequisites: ANTH 202, or ANTH 205, or ANTH 206, or ANTH 212, or East Asian Studies Honours/Major, or permission of instructor) A study of 20th Century Chinese economic, social and cultural institutions, their transformations and continuities. Topics include village economic development and social change; gender, family and kinship organization, regional differences and minority groups; urban-industrial change; and the effects of revolution and reform.

ANTH 331 PREHISTORY OF EAST ASIA. (3) (Fall) (Prerequisite: ANTH 201 or permission of instructor) Comparative study of prehistoric hunting and gathering cultures in China, Japan, Korea, Mongolia and Eastern Siberia; origins and dispersal of food production; cultural processes leading to the rise of literate civilizations in certain regions of East Asia.

● **ANTH 333 CLASS AND ETHNICITY.** (3) (Prerequisite: ANTH 202, or ANTH 205, or ANTH 206, or ANTH 212, or permission of instructor)

● **ANTH 335 ANCIENT EGYPTIAN CIVILIZATION.** (3) (Prerequisite: ANTH 201, or ANTH 202, or permission of instructor)

● **ANTH 336 ETHNOHISTORY: NORTH EASTERN NORTH AMERICA.** (3) (Prerequisite: HIST 202, or ANTH 206, or ANTH 306, or ANTH 338, or permission of instructor)

● **ANTH 337 MEDITERRANEAN SOCIETY AND CULTURE.** (3) (Prerequisite: ANTH 202, or ANTH 204, or ANTH 205, or ANTH 206, or ANTH 209, or ANTH 212, or ANTH 227) (Restriction: U2 or U3 standing only)

ANTH 338 NATIVE PEOPLES OF NORTH AMERICA. (3) (Fall) (Prerequisite: ANTH 202, or ANTH 204, or ANTH 205, or ANTH 206, or ANTH 209, or ANTH 212, or GEOG 336, or permission of instructor) Ethnographic survey of Native cultures in North America. Conditions arising from European colonization and their social, economic and political impact. Contemporary situation of indigenous peoples.

ANTH 339 ECOLOGICAL ANTHROPOLOGY. (3) (Winter) (Prerequisite: ANTH 204, or ANTH 206, or SOCI 328, or GEOG 300 or permission of instructor) Intensive study of theories and cases in ecological anthropology. Theories are examined and tested through comparative case-study analysis. Cultural constructions of "nature" and "environment" are compared and analyzed. Systems of resource management and conflicts over the use of resources are studied in depth.

● **ANTH 341 WOMEN IN CROSS-CULTURAL PERSPECTIVE.** (3) (Prerequisites: ANTH 202 or ANTH 205, or ANTH 206, or ANTH 342, or Women's Studies Minor, or permission of instructor)

ANTH 342 GENDER, INEQUALITY AND THE STATE. (3) (Fall) (Prerequisite: ANTH 202, or ANTH 205, or ANTH 206, or ANTH 341, or Women's Studies Minor, or permission of instructor) Comparative studies of gender in stratified societies: Asia, the Mid-East, Latin and North America. Economic, political and social manifestations of gender inequality. Oppressive and egalitarian ideologies. State and institutional policies on gender, and male-female strategies. Sexual apartheid and integration.

ANTH 348 EARLY PREHISTORY: NEW WORLD. (3) (Winter) (Prerequisite: ANTH 201 or ANTH 203, or permission of instructor) Consideration of major issues regarding the initial arrival(s) of human groups in the New World, and their subsequent adaptation to the changing environmental conditions at the end of the Ice Age.

ANTH 352 HISTORY OF ANTHROPOLOGICAL THEORY. (3) (Fall) (Prerequisites: one 200-level anthropology course and one other anthropology course at any level) (Restricted to Honours, Joint Honours, Major and Minor students in Anthropology, U2 standing or above) Exploration in the history of anthropological theory; schools, controversies, intellectual history, sociology of knowledge.

ANTH 355 THEORIES OF CULTURE AND SOCIETY. (3) (Winter) (Prerequisites: one 200-level anthropology course and one other anthropology course at any level) (Restricted to Honours, Joint Honours, Major and Minor students in Anthropology, U2 standing or above) Contributions to contemporary anthropological theory; theoretical paradigms and debates; forms of anthropological explanation; the role of theory in the practice of anthropology; concepts of society, culture and structure; the development of analytical concepts of small-scale and non-Western societies; cultural evolution and relativity.

ANTH 357 ARCHAEOLOGICAL METHODS. (3) (Winter) (Prerequisite: ANTH 201 and one other course in archaeology) (Restricted to Honours, Joint Honours and Major students in Anthropology, U2 standing or above) The collection of materials in field investigations and their analysis to yield cultural information. The processes of inference and reconstruction in archaeological interpretation.

ANTH 358 THE PROCESS OF ANTHROPOLOGICAL RESEARCH. (3) (Fall) (Prerequisites: one 200-level anthropology course and one other anthropology course at any level) (Restricted to Honours, Joint Honours, Major and Minor students in Anthropology, U2 standing or above) The nature of anthropological research as evidenced in monographs and articles; processes of concept formation and interpretation of data; the problem of objectivity.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ANTH 359 HISTORY OF ARCHAEOLOGICAL THEORY. (3) (Fall) (Prerequisite: ANTH 201 or ANTH 203, and one additional course in archaeology, or permission of instructor) A systematic investigation of the theories that have guided the interpretation of prehistoric archaeological data since the Middle Ages; the relationship between these theories and theoretical developments in the other social sciences.

ANTH 380 SPECIAL TOPIC. (3) (Prerequisite: Permission of instructor) Supervised reading in special topics under the direction of a member of the staff.

ANTH 381 SPECIAL TOPIC. (3) (Prerequisite: Permission of instructor) Supervised reading in special topics under the direction of a member of the staff.

ANTH 382 SPECIAL TOPIC. (3) (Prerequisite: Permission of instructor) Supervised reading in special topics under the direction of a member of the staff.

ANTH 383 SPECIAL TOPIC. (3) (Prerequisite: Permission of instructor) Supervised reading in special topics under the direction of a member of the staff.

ANTH 402 TOPICS IN ETHNOGRAPHY 1. (3) (Fall) (Prerequisite: ANTH 301 or permission of instructor.) (Restriction: U3 students in Anthropology or permission of instructor) (Topic: Middle East) An exploration of selected ethnographic case material. Investigation of a regional literature or survey of significant contributions to ethnography or examination of an ethnological issue.

ANTH 403 CURRENT ISSUES IN ARCHAEOLOGY. (3) (Fall) (Prerequisite: ANTH 357 or preferably ANTH 359, or permission of instructor) Current issues in archaeological interpretation, in particular, those relating to processual and postprocessual archaeology.

ANTH 405 TOPICS IN ETHNOGRAPHY 2. (3) (Fall) (Prerequisite: One 300-Level Anthropology course) (Restriction: U3 students in Anthropology or permission of instructor) (Topic: TBA.) An exploration of selected ethnographic case material. Investigation of a regional literature, or survey of significant recent contributions to ethnography, or examination of a current ethnological issue.

ANTH 407 ANTHROPOLOGY OF THE BODY. (3) (Winter) (Prerequisite: ANTH 227 and Honours/Major/Minor status in Anthropology or permission of instructor) This course will survey theoretical approaches used over the past 100 years, and then focus on contemporary debates using case studies. The nature/culture mind/body, subject/object, self/other dichotomies central to most work of the body will be problematized.

ANTH 412 TOPICS: ANTHROPOLOGICAL THEORY. (3) (Winter) (Restriction: U3 students in Anthropology and ANTH 355 or permission of instructor) (Topic: TBA) A concentrated examination of selected theoretical literature. A current theoretical issue will be examined, or the work of a major anthropological theorist or school will be explored and assessed.

ANTH 413 GENDER IN ARCHAEOLOGY. (3) (Winter) (Prerequisite: ANTH 201 or ANTH 331 or ANTH 345 or ANTH 347 or ANTH 348 or permission of instructor) (Restrictions: not open to students who have taken 151-403 in 1997-98 or 1998-99) Relationship between the structure of the archaeological discipline and construction of gender roles in past human societies; division of tasks between men and women in subsistence activities, organization of the household and kin groups; and creation of power and prestige in a larger community.

ANTH 416 ENVIRONMENT/DEVELOPMENT: AFRICA. (3) (Winter) (Open only to students in the Study in Africa program, a full-term field study program in East Africa) (Prerequisite: One prior course in Anthropology, Geography or Environmental Studies) Study of environmental effects of development in East Africa, especially due to changes in traditional land tenure and resource use across diverse ecosystems. Models, policies and cases of pastoralist, agricultural, fishing, wildlife and tourist development will be examined, across savanna, desert, forest, highland and coastal environments.

ANTH 418 ENVIRONMENT AND DEVELOPMENT. (3) (Fall) (Prerequisite: ANTH 339, or ANTH 349, or SOCI 328, or GEOG 300, or

GEOG 302, or permission of instructor) Advanced study of the environmental crisis in developing and advanced industrial nations, with emphasis on the social and cultural dimensions of natural resource management and environmental change. Each year, the seminar will focus on a particular set of issues, delineated by type of resource, geographic region, or analytical problem.

ANTH 419 ARCHAEOLOGY OF HUNTER-GATHERERS. (3) (Fall) (Prerequisite: ANTH 357 or permission of instructor) A systematic investigation into current theoretical and methodological concerns in hunter-gatherer archaeology. Examples will be drawn from around the world.

● **ANTH 420 LITHIC TECHNOLOGY AND ANALYSIS.** (3)

ANTH 430 SYMBOLIC ANTHROPOLOGY. (3) (Fall) (Prerequisite: ANTH 204, or ANTH 355, or permission of instructor) Advanced topics in the use of symbolic theory within anthropology, including culture and structuralism; the use of semiotic models of society, the relation of structure to process, culture to praxis, and ideology to society; the relevance of epistemology, phenomenology and linguistic philosophy for the study of socio-cultural phenomena.

● **ANTH 431 PROBLEMS IN EAST ASIAN ARCHAEOLOGY.** (3) (Prerequisite: ANTH 331 or permission of instructor)

ANTH 436 NORTH AMERICAN NATIVE PEOPLES. (3) (Fall) (Prerequisite: ANTH 338, or ANTH 336, or permission of instructor) (Topic: TBA) A detailed examination of selected contemporary problems.

ANTH 438 TOPICS IN MEDICAL ANTHROPOLOGY. (3) (Fall) (Prerequisite: ANTH 227 or permission of instructor) (Topic: TBA) Conceptions of health and illness and the form and meaning that illness take are reflections of a particular social and cultural context. Examination of the metaphoric use of the body, comparative approaches to healing, and the relationship of healing systems to the political and economic order and to development.

● **ANTH 439 THEORIES OF DEVELOPMENT.** (3) (Prerequisite: ANTH 212 or permission of instructor)

ANTH 440 COGNITIVE ANTHROPOLOGY. (3) (Fall) (Prerequisite, two of the following: ANTH 204, ANTH 314, ANTH 352, ANTH 355, or ANTH 430, or permission of instructor.) The problem of knowledge; the nature of perception; the concept of mind; the relation between thought and language. The concept of meaning: communication, interpretation and symbolism. Social aspects of cognition; ideology.

ANTH 443 MEDICAL ANTHROPOLOGICAL THEORY. (3) (Prerequisites: ANTH 227 and Honours/Major/Minor status in Anthropology or permission of instructor.) This course is intended to provide a comprehensive survey of the literature that constitutes the theoretical and conceptual core of medical anthropology. Emphasis is given to (1) the ethnographic sources of these ideas, (2) their epistemology, and (3) their methodological implications. (Topic for Fall 2003: Biomedical Technologies) (Topic for Winter 2004: Evolution, Mind and Psychiatric Disorder)

● **ANTH 445 PROPERTY AND LAND TENURE.** (3) (Prerequisite: ANTH 212 or ANTH 301 or ANTH 321 or ANTH 322 or ANTH 324 or ANTH 339 or ANTH 349; or permission of instructor. U3 students only)

ANTH 461 RESEARCH TECHNIQUES. (3) (Winter) (Prerequisite: ANTH 358 or permission of instructor) (U3 student only) Field techniques, interviewing, participant observation, projective, and other testing techniques such as genealogies and life histories, problems of field work, rapport, contact, role definition, culture shock, etc.

ANTH 480 SPECIAL TOPICS. (3) (Prerequisite: Completion of all available courses relevant to the topic and consent of the instructor) Supervised reading in advanced special topics under direction of a member of staff.

ANTH 481 SPECIAL TOPICS. (3) (Prerequisite: Completion of all available courses relevant to the topic and consent of the instructor) Supervised reading in advanced special topics under direction of a member of staff.

ANTH 482 SPECIAL TOPICS. (3) (Prerequisite: Completion of all available courses relevant to the topic and consent of the instructor)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

Supervised reading in advanced special topics under direction of a member of staff.

ANTH 483 SPECIAL TOPICS. (3) (Prerequisite: Completion of all available courses relevant to the topic and consent of the instructor) Supervised reading in advanced special topics under direction of a member of staff.

ANTH 484 SPECIAL TOPICS. (3) (Prerequisite: Completion of all available courses relevant to the topic and consent of the instructor) Supervised reading in advanced special topics under direction of a member of staff.

ANTH 485 SPECIAL TOPICS. (3) (Prerequisite: Completion of all available courses relevant to the topic and consent of the instructor) Supervised reading in advanced special topics under direction of a member of staff.

ANTH 490 HONOURS THESIS 1. (6) (Prerequisites: U3 Honours status and permission of instructor) Supervised reading and preparation of a research report under the direction of a member of staff.

ANTH 491 HONOURS THESIS 2. (6) (Prerequisites: U3 Honours status and permission of instructor) Supervised reading and preparation of a research report under the direction of a member of staff.

● **ANTH 492 HONOURS THESIS.** (6) (Prerequisites: U3 Honours status and permission of instructor)

ANTH 492D1 HONOURS THESIS. (3) (Students must also register for ANTH 492D2) (No credit will be given for this course unless both ANTH 492D1 and ANTH 492D2 are successfully completed in consecutive terms) (ANTH 492D1 and ANTH 492D2 together are equivalent to ANTH 492) Supervised reading and preparation of a research report under the direction of a member of staff.

ANTH 492D2 HONOURS THESIS. (3) (Prerequisite: ANTH 492D1) (No credit will be given for this course unless both ANTH 492D1 and ANTH 492D2 are successfully completed in consecutive terms) (ANTH 492D1 and ANTH 492D2 together are equivalent to ANTH 492) See ANTH 492D1 for course description.

May also be offered as: ANTH 492N1 and ANTH 492N2

ANTH 551 ADVANCED TOPICS: ARCHAEOLOGICAL RESEARCH. (3) (Winter) Examination and discussion of topics of current theoretical or methodological interest in archaeology. Topics will be announced at the beginning of term.

● **ANTH 555 ADVANCED TOPICS IN ETHNOLOGY.** (3) (Restriction: Honours students at the U3 level in the Anthropology Department or with permission of instructor)

ARTH – Art History

Offered by: Department of Art History and Communication Studies
Former Teaching Unit Code: 123

Some Art History courses may be offered in French; consult with the Departmental office for details. In any case, students may do all written work, including examinations, in English or French as they choose.

Art History courses are open to non-Art History students and Joint Honours students in Art History on a limited basis.

● **ARTH 201 INTRODUCTION TO ART HISTORY 2.** (3) (Not open to students in Art History programs; or students who have taken ARTH 200 prior to Fall 1991.)

ARTH 203 METHODS IN ART HISTORY. (3) (Winter) (Required for Art History students) (Not open to students who have taken 123-305) An introduction to the main methodologies used in the analysis of the work of art: formalism, iconography/iconology, semiotics, structuralism, post-structuralism, deconstruction, psychoanalysis, Marxism, feminism and postcolonialism.

● **ARTH 204 INTRODUCTION TO MEDIEVAL ART AND ARCHITECTURE.** (3)

● **ARTH 205 INTRODUCTION TO MODERN ART.** (3)

ARTH 207 EUROPEAN ART (1400-1700). (3) This course considers issues of style, iconography, patronage, context and function with

respect to 300 years of painting and sculpture in Europe. It explores how works of art come into being, why they take on particular qualities, and how they have been received over the passage of time.

ARTH 223 EARLY RENAISSANCE ART IN ITALY. (3) The emergence of a new concept of art in Italy during the 15th century expressed in the works of the most important artists of the period. Emphasis on the relationship of the visual arts to the classical tradition and to contemporary literature, philosophy and social conditions.

ARTH 300 CANADIAN ART TO 1914. (3) Canadian art from the pre-contact period through the colonial and nation-building centuries until the onset of the First World War. Emphasis will be placed on the diverse cultural influences that have been brought into contact in Canada.

ARTH 301 CANADIAN ART 1914 - PRESENT. (3) (Not open to students who have taken 123-225) Canadian art from early 20th century formulations of national identity through the regional, national, and international movements that define Canadian Modernism, Postmodernism, to new trends emerging in the 21st century.

● **ARTH 302 ASPECTS OF CANADIAN ART.** (3)

ARTH 314 THE MEDIEVAL CITY. (3) Towns and cities in the Middle Ages as architectural entities, their urban planning and development; main building types, profane and ecclesiastical: castle, defence works, town halls, houses, cathedrals, churches and monasteries; the role architecture played in forming a society.

ARTH 320 BAROQUE ART IN ITALY. (3) (Not open to students who have taken 123-334D) A study of seventeenth century painting and sculpture in Italy. The art of such major masters as Caravaggio, Carracci, Bernini and Pietro da Cortona is examined against the social, intellectual and religious climate of the Age.

● **ARTH 321 BAROQUE IN THE NORTH.** (3) (Prerequisite: ARTH 320) (Not open to students who have taken 123-334D)

● **ARTH 323 REALISM AND IMPRESSIONISM.** (3)

● **ARTH 324 HIGH RENAISSANCE ART IN ITALY.** (3) (Not open to students who have taken 123-224)

● **ARTH 325 VENETIAN HIGH RENAISSANCE PAINTING.** (3)

● **ARTH 332 ITALIAN RENAISSANCE ARCHITECTURE.** (3)

● **ARTH 333 ITALIAN BAROQUE ARCHITECTURE.** (3) (Not open to students who have taken 123-333D)

ARTH 335 ART IN THE AGE OF REVOLUTION. (3) The course deals primarily with European painting from the late 18th to the middle of the 19th century. Emphasis is placed on the relation of art to the political, social and intellectual transformations of the time. Major figures, such as David, Goya, Canova, Friedrich and Delacroix are considered.

● **ARTH 337 MODERN PAINTING AND SCULPTURE, POST-IMPRESS TO WWI.** (3) (Not open to students who have taken 123-337D)

ARTH 338 MODERN ART AND THEORY FROM WWI - 1960s. (3) (Not open to students who have taken 123-337D) An examination of the historical avant-garde's questioning of the distance between art and life, leading to the paradoxical involvement between modernism, mass culture and technologies of reproduction.

● **ARTH 339 CRITICAL ISSUES - CONTEMPORARY ART.** (3)

● **ARTH 340 THE GOTHIC CATHEDRAL.** (3) Prerequisite: reading knowledge of French.)

● **ARTH 341 ROMANESQUE ARCHITECTURE IN THE WEST.** (3)

● **ARTH 345 HISTORY OF GERMAN ARCHITECTURE.** (3)

● **ARTH 348 20TH CENTURY ARCHITECTURE.** (3)

● **ARTH 351 VISION AND VISUALITY IN ART HISTORY.** (3)

● **ARTH 352 FEMINISM IN ART AND ART HISTORY.** (3)

ARTH 353 SELECTED TOPICS IN ART HISTORY 1. (3) (Topic for Fall 2003: Contemporary Art and Time-Based Media) (Topic for Winter 2004: TBA) Study of a special field in the History of Art and Architecture taught by a visiting scholar.

ARTH 354 SELECTED TOPICS ART HISTORY 2. (3) (Topic for 2003-04 Fall: TBA) (Topic for 2003-04 Winter: Body and Figure in Chi-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

nese Art from the Han Dynasty to the Present) Study of a special field in the History of Art and Communications.

● **ARTH 360 PHOTOGRAPHY AND ART.** (3) T

ARTH 379 STUDIES: MODERN ART AND THEORETICAL PROBLEMS. (3) (Topic for Fall 2003: Quebec Art)

● **ARTH 415 LATE MEDIEVAL & RENAISSANCE ARCHITECTURE IN NORTHERN EUROPE.** (3)

● **ARTH 416 ENGLISH MEDIEVAL ARCHITECTURE.** (3)

ARTH 420 SELECTED TOPICS IN ART AND ARCHITECTURE 1. (3) (Topic for Fall 2003: Art in China 1949-2000) (Topic for Winter 2004: Museum Studies) An advanced study of selected topics in the History of Art and Architecture. Course will be given at the Musée d'art contemporain.

ARTH 421 SELECTED TOPICS IN ART AND ARCHITECTURE 2. (3) (Topic for 2003-04: An advanced study of selected topics in the History of Art and Architecture.) Topic for 2002-03: TBA

● **ARTH 435 RUBENS, VAN DYCK AND VELASQUEZ.** (3)

ARTH 447 INDEPENDENT RESEARCH COURSE. (3) (Prerequisite: permission of instructor)

● **ARTH 473 STUDIES IN 17TH AND EARLY 18TH CENTURY ART.** (3)

ARTH 474 STUDIES IN LATER 18TH AND 19TH CENTURY ART. (3) Topic for 2002-03: The challenge of the Avant-Garde.

● **ARTH 479 STUDIES: MODERN ART AND THEORETICAL PROBLEMS.** (3)

ARTH 490 MUSEUM INTERNSHIP. (3) The Museum Internship is intended to provide direct exposure to museum collections and practical experience in the museum setting for students interested in museum professions. Individually designed in consultation with the professor in charge of internships and the appropriate personnel at one of the Montreal museums.

ARTH 500 PRO-SEMINAR. (3) (Restriction: Open to final-year Honours, M.A., and Ph.D. Students.) A seminar course dealing with methodological issues in Art History.

CANS – Canadian Studies

Offered by: Institute for the Study of Canada
Former Teaching Unit Code: 106

Prerequisites are needed for most courses above the 200 level. Students lacking prerequisites or written permission from the course instructor may be required to drop courses.

CANS 200 INTRODUCTION TO THE STUDY OF CANADA. (3) (3 lecture hours and 1 conference hour) An overview of approaches to the study of Canada, including economic, political, historical and cultural dimensions.

CANS 202 CANADIAN CULTURES: CONTEXT AND ISSUES. (3) (Prerequisite: ability to read French) A survey course which traces the history of Canadian cultures from the middle of the 19th century to the present. It surveys the diversity of Canadian cultural identities through literature, drama, art and the mass media. The course features guest lecturers. Some course material will be in French.

CANS 300 TOPICS IN CANADIAN STUDIES 1. (3) (Prerequisite: CANS 200 or permission of instructor.) (Topic for 2003-04: Geography of Canada. An introduction to the geography of Canada. A comprehensive geographical interpretation of Canada's salient physical and human characteristics, including landscapes and their evolution, climate, vegetation, society, land relationships and socio-economic attributes of the population. (Students registering in this course cannot register in GEOG 309.)) An interdisciplinary course on a Canadian Studies topic.

CANS 301 TOPICS IN CANADIAN STUDIES 2. (3) (Prerequisite: CANS 200.) (Topic for 2003-2004: Native Studies Issues: The Past Meets the Present. A survey of present-day achievements, problems and concerns within Native societies across Canada with particular focus on the Crees of eastern James Bay. Questions of political organization and leadership, land claims, education, justice

and business development will be examined in their present-day complexity.) An interdisciplinary course on a Canadian Studies topic.

CANS 303 TOPICS IN CANADIAN STUDIES 3. (3) (Prerequisite: CANS 200 or permission of instructor) An interdisciplinary course on a Canadian Studies topic. Topic for 2003-04: Provincial Politics. The effect of regional and provincial culture on the operation of political parties and the institutions of government, the effect of institutional modernization on provincial governments; the role of provincial sub-systems within the Canadian political system. (Students registering in the course may not register in POLI 326)

CANS 401 CANADIAN STUDIES SEMINAR 1. (3) (Prerequisite: CANS 200 or permission of instructor) An interdisciplinary seminar on a Canadian Studies topic. Topic for 2003-04: TBA

CANS 402 CANADIAN STUDIES SEMINAR 2. (3) (Prerequisite: CANS 200 or permission of instructor.) (Topic for 2003-04: Globalization and the Canadian State. This course will analyse the effects of the multilateral (World Trade Organization) and the continental (North American Free Trade Agreement) trading systems on the Canadian state. In particular, the effects of recent economic and technological forces on Canadian political processes and structures and on selected public policies will be examined.) An interdisciplinary seminar on a Canadian Studies topic.

CANS 403 REPRESENTING MATERIAL CULTURE. (3) (Prerequisite: Restricted to U2 and U3 students) Studying the Canadian past through media, museums and art gallery exhibitions. This course examines 20th century Canadian public exhibitions featuring documents, photographs, film, fine and decorative arts, and how they may reveal historical truths and/or create myths about Canada's past.

CANS 404 CANADIAN STUDIES SEMINAR 4. (3) (Prerequisite: CANS 200 or permission of instructor.) An interdisciplinary seminar on a Canadian Studies topic. Topic for 2003-04: TBA.

CANS 405 CANADIAN STUDIES SEMINAR 5. (3) (Prerequisite: CANS 200 or permission of instructor.) (Topic for 2003-04: Two Takes on Shorting the Canon: Canadian Short Fiction in English and French (1960-2000) Within a Canadian studies and comparative literature framework, this course will examine the similar, and different literary, social, and cultural factors which explain the emergence of the short story, despite its continued institutional marginalisation, as a major contemporary genre in both anglophone and francophone literatures in Canada and Quebec.) An interdisciplinary seminar on a Canadian Studies topic.

CANS 406 CANADIAN STUDIES SEMINAR 6. (3) (Prerequisite CANS 200 or permission of instructor.) An interdisciplinary seminar on a Canadian Studies topic. Topic for 2003-04: Selected topics in Canadian Politics Selected problem areas in Canada's political process, political culture, constitutional development, and machinery of government. (Students registering in the course may not register in POLI 427)

CANS 407 UNDERSTANDING ATLANTIC CANADA. (3) (Restriction: Students must be enrolled in Bay of Fundy Field Semester.) (Prerequisite: ENVR 201 and HIST 203; or permission of instructor.) (Corequisite: GEOG 497; ENVR 465; ENVR 466.) Historical context of current social, political, economic and environmental issues in Atlantic Canada. Social and economic development, resource use, and culture will be examined in relation to the region's maritime context.

CANS 408 INDIVIDUAL READING COURSE. (3) (Restrictions: Reserved for final-year students enrolled in the Canadian Studies major or minor concentration. Permission must be obtained from the Canadian Studies advisor and from the supervising professor before registration.) Supervised reading on an explicitly multidisciplinary topic under the direction of a professor working in the field of Canadian Studies.

CANS 409 CANADIAN STUDIES SEMINAR 9. (3) (Prerequisite: CANS 200 or permission of instructor.) An interdisciplinary seminar on a Canadian Studies topic. Topic will vary from year to year depending on staff interests.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

CANS 410 CANADIAN STUDIES SEMINAR 10. (3) (Prerequisite: CANS 200 or permission of instructor.) (Topic for 2003-04: Literary Montreal. Montreal's role as the pulse of Canada's shifting realities post WWII (geographical, political, economic, social and historical) will be examined through close analysis of literature of some of Canada's best and best-loved writers: including Mordecai Richler, Gabrielle Roy, Gwethalyn Graham, Hugh MacLennan, Leonard Cohen, Patrick Anderson, Anne Carson, Gail Scott. As well as reading poetry and fiction, students will familiarize themselves with Montreal's contemporary literary landscape (by touring the city, attending literary events, and scrutinizing contemporary media representations of the city.) An interdisciplinary seminar on a Canadian Studies topic.

CANS 492 JOINT HONOURS THESIS. (3) (Open to students in the Joint Honours Program.) Honours thesis research to be carried out under the supervision of a faculty member.

Also offered as:

CANS 492D1 JOINT HONOURS THESIS. (1.5) (Open to students in the Joint Honours Program.) (Students must also register for CANS 492D2)

CANS 492D2 JOINT HONOURS THESIS. (1.5) (Prerequisite: CANS 492D1)

CANS 501 PROFESSIONAL DEVELOPMENT SEMINAR 1. (3) (Prerequisite: For undergraduate students CANS 200 or permission of instructor.) (Restriction: Course will be restricted to final year students and graduate students.) An interdisciplinary professional development seminar in Canadian Studies.

CATH – Catholic Studies

Offered by: Arts - Dean's Office
Former Teaching Unit Code: 190

CATH 200 INTRODUCTION TO CATHOLICISM. (3) (Fall) An interdisciplinary study of the Roman Catholic tradition in its changing contexts. Traces major themes in the Catholic tradition. Emphasis will vary from year to year on spiritual, intellectual, institutional, cultural and historical dimensions.

CATH 310 CATHOLIC INTELLECTUAL TRADITIONS. (3) (Winter) (Prerequisites: CATH 200, RELG 320, or permission of instructor) This course examines Catholic intellectual perspectives, schools of thought, and major thinkers, with focus on topics such as God, faith and reason, the human person, history, culture and community. Will also examine the interaction between Catholicism and other perspectives and traditions.

CATH 315 CATHOLICISM AND MORAL CULTURE. (3) (Winter) (Prerequisite: CATH 200, or permission of instructor) A critical examination of theological and philosophical perspectives which inform contemporary Catholic moral thinking. This course explores the interplay of the evolving body of Catholic moral teaching with other developments and debates in ethics.

● **CATH 320 SCRIPTURE AND CATHOLICISM.** (3) (Prerequisite: CATH 200, or permission of instructor)

CATH 325 THE RELIGIOUS SENSE. (3) (Restriction: Not open to those who have taken 190-370A in 2001-02 or CATH 370 in 2002-03.) An inquiry into what constitutes the religious sense, from a Catholic perspective; the relationship between reason, moral certainty and the religious sense; reasonable and unreasonable positions and concrete strategies before the ultimate questions concerning existence; freedom and responsibility, using literature, music and film.

CATH 340 CATHOLIC SOCIAL THOUGHT. (3) (Winter) (Prerequisite: CATH 200, or permission of instructor) Explores Catholic social and political thought from a comparative perspective. Topics may include the Church-State distinction, subsidiary, the common good, pluralism, the Catholic human rights revolution, natural law and the international order, Christian Democracy and the relationship between Catholicism, liberalism and communitarianism.

CATH 370 TOPICS IN CATHOLIC STUDIES. (3) (Fall) (Permission of instructor) Topic 2003: Flannery O'Connor: the stories and the critical writings.

CATH 460 CATHOLIC STUDIES SEMINAR. (3) (Prerequisite: CATH 200, or permission of instructor) A research seminar on a major theme and/or thinker. The seminar will evolve around primary source materials.

CLAS – Classics

Offered by: Department of History
Former Teaching Unit Code: 114

● **CLAS 200 GREEK CIVILIZATION: FOUNDATIONS.** (3)

● **CLAS 202 GREEK CIVILIZATION: CLASSICAL.** (3)

CLAS 203 GREEK MYTHOLOGY. (3) A survey of the myths and legends of Ancient Greece.

● **CLAS 208 ROMAN LITERATURE AND SOCIETY.** (3)

● **CLAS 210 INTRODUCTORY LATIN 1.** (6)

CLAS 210D1 INTRODUCTORY LATIN 1. (3) (Students must also register for CLAS 210D2) (No credit will be given for this course unless both CLAS 210D1 and CLAS 210D2 are successfully completed in consecutive terms) (CLAS 210D1 and CLAS 210D2 together are equivalent to CLAS 210) A course for beginners.

CLAS 210D2 INTRODUCTORY LATIN 1. (3) (Prerequisite: CLAS 210D1) (No credit will be given for this course unless both CLAS 210D1 and CLAS 210D2 are successfully completed in consecutive terms) (CLAS 210D1 and CLAS 210D2 together are equivalent to CLAS 210) See CLAS 210D1 for course description.

CLAS 212 INTRODUCTORY LATIN 2. (3) (Winter) (Permission of instructor required) A refresher course. Review of grammar and syntax; reading of simple sentences and connected passages.

CLAS 220D1 INTRODUCTORY ANCIENT GREEK. (3) (Students must also register for CLAS 220D2) (No credit will be given for this course unless both CLAS 220D1 and CLAS 220D2 are successfully completed in consecutive terms) A course for beginners.

CLAS 220D2 INTRODUCTORY ANCIENT GREEK. (3) (Prerequisite: CLAS 220D1) (No credit will be given for this course unless both CLAS 220D1 and CLAS 220D2 are successfully completed in consecutive terms) See CLAS 220D1 for course description.

CLAS 230D1 INTRODUCTORY MODERN GREEK. (3) (Not open to students who have taken or are taking CLAS 236, CLAS 237 or CLAS 238.) (Students must also register for CLAS 230D2) (No credit will be given for this course unless both CLAS 230D1 and CLAS 230D2 are successfully completed in consecutive terms) A course for beginners.

CLAS 230D2 INTRODUCTORY MODERN GREEK. (3) (Prerequisite: CLAS 230D1) (No credit will be given for this course unless both CLAS 230D1 and CLAS 230D2 are successfully completed in consecutive terms) See CLAS 230D1 for course description.

CLAS 300 GREEK DRAMA AND THE THEATRE. (3) A study of the Greek dramatists, both tragic and comic, in the light of their plays, with special emphasis on the theatrical techniques of the authors and the means of production in the Greek theatre.

CLAS 309 THE GREEK AND ROMAN NOVEL. (3) A study of the ancient novel, including Petronius, The Satyricon, Apuleius, The Golden Ass and Longus, Daphnis and Chloe.

CLAS 311 CATULLUS/OVID. (3) (Prerequisite: CLAS 210 or CLAS 211 or CLAS 212 or permission of the Department) (Topic for 2003-04: Ovid, Metamorphoses I)

● **CLAS 312 INTERMEDIATE LATIN: POETRY.** (3) (Prerequisite: CLAS 210 or CLAS 211 or CLAS 212 or permission of the Department)

● **CLAS 313 INTERMEDIATE LATIN: CICERO.** (3) (Prerequisite: CLAS 210 or CLAS 211 or CLAS 212 or permission of the Department)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

CLAS 314 INTERMEDIATE LATIN: HISTORIANS. (3) (Prerequisite: CLAS 210 or CLAS 211 or CLAS 212 or permission of the Department) (Topic for 2003-04: Pliny the Younger)

● **CLAS 315 INTERMEDIATE LATIN: SELECTIONS.** (3) (Prerequisite: CLAS 210 or CLAS 211 or CLAS 212 or permission of the Department)

● **CLAS 321 INTERMEDIATE GREEK: PLATO/XENOPHON.** (3) (Prerequisite: CLAS 220 or permission of the instructor)

● **CLAS 322 INTERMEDIATE GREEK: ORATORS.** (3) (Prerequisite: CLAS 220 or permission of the instructor)

● **CLAS 323 INTERMEDIATE GREEK: HOMER.** (3) (Prerequisite: CLAS 220 or permission of the instructor)

CLAS 324 INTERMEDIATE GREEK: POETRY. (3) (Prerequisite: CLAS 220 or permission of the instructor)

● **CLAS 325 INTERMEDIATE GREEK: LATER PROSE.** (3) (Prerequisite: CLAS 220 or permission of the instructor)

CLAS 326 INTERMEDIATE GREEK: SELECTIONS. (3) (Prerequisite: CLAS 220 or permission of instructor)

● **CLAS 331 INTERMEDIATE MODERN GREEK LANGUAGE.** (3) (Prerequisite: CLAS 230 or CLAS 235 or CLAS 237 or permission of the instructor)

CLAS 332 THE MODERN GREEK NOVEL. (3) (Prerequisite: CLAS 220 or permission of instructor)

● **CLAS 333 MODERN GREEK POETRY.** (3) (Prerequisite: CLAS 230 or permission of the instructor)

CLAS 335 LANGUAGE AND CIVILIZATION/MODERN GREECE 2. (3) (Prerequisites: CLAS 237 or permission of the instructor) A continuation of CLAS 331.

● **CLAS 370 WOMEN IN GREEK DRAMA.** (3)

CLAS 404 CLASSICAL TRADITION. (3) (Prerequisite: 3 credits in Classics or related courses; or permission of instructor) Some episodes from the long history of the transmission and reception of the Classics in later times. Students will choose periods or times for special study.

CLAS 411 ADVANCED LATIN: EPIC. (3) (Prerequisites: 9 credits of Intermediate Latin or permission of instructor) (Topic for 2003-04: Vergil: Aeneid I, IV) The reading of selected texts in Roman Epic Poetry in the original Latin.

● **CLAS 412 ADVANCED LATIN: LYRIC.** (3) (Prerequisites: 9 credits of Intermediate Latin or permission of instructor)

● **CLAS 413 ADVANCED LATIN: SATIRE.** (3) (Prerequisite: 9 credits of Intermediate Latin or permission of instructor)

● **CLAS 414 ADVANCED LATIN: HISTORY.** (3) (Prerequisite: 9 credits of Intermediate Latin or permission of instructor)

● **CLAS 415 ADVANCED LATIN: ORATORY.** (3) (Prerequisite: 9 credits of Intermediate Latin or permission of instructor)

● **CLAS 416 ADVANCED LATIN: PHILOSOPHY.** (3) (Prerequisite: 9 credits of Intermediate Latin or permission of instructor)

● **CLAS 421 ADVANCED ANCIENT GREEK: EPIC.** (3) (Prerequisite: 9 credits of Intermediate Ancient Greek or permission of instructor)

● **CLAS 423 ADVANCED ANCIENT GREEK: DRAMA.** (3) (Prerequisite: 9 credits of Intermediate Ancient Greek or permission of instructor)

CLAS 422 ADVANCED ANCIENT GREEK: LYRIC. (3) (Prerequisite: 9 credits of Intermediate Ancient Greek or permission of instructor) The reading of selected texts in Greek Lyric Poetry in the original Ancient Greek.

CLAS 424 ADVANCED GREEK: HISTORY. (3) (Prerequisites: 9 credits of Intermediate Ancient Greek or permission of instructor) The reading of selected texts in Greek History Prose in the original Ancient Greek.

CLAS 425 ADVANCED GREEK: ORATORY. (3) (Prerequisite: 9 credits of Intermediate Greek or permission of instructor) The reading of selected texts in Greek Oratory Prose in the original Ancient Greek.

CLAS 426 ADVANCED GREEK: PHILOSOPHY. (3) (Prerequisite: 9 credits of Intermediate Ancient Greek or permission of instructor)

The reading of selected texts in Greek Philosophy Prose in the original Ancient Greek.

CLAS 449 SEMINAR: NATURAL LAW. (3) (Prerequisite: a relevant course in political or legal philosophy or in ancient history) The origin, development and criticism of theories of natural law in the Greek and Roman thinkers. Attention will be paid to the influence of these theorists on conceptions of natural law in the modern world. Original sources to be read in translation.

CLAS 515D1 LATIN AUTHORS. (3) (Prerequisite: 9 credits in Intermediate Latin or equivalent) (Restricted to Honours and Graduate students) (Students must also register for CLAS 515D2) (No credit will be given for this course unless both CLAS 515D1 and CLAS 515D2 are successfully completed in consecutive terms) Completion of a Reading List in Latin, with Faculty supervision, to be tested by written examination.

CLAS 515D2 LATIN AUTHORS. (3) (Prerequisite: CLAS 515D1) (No credit will be given for this course unless both CLAS 515D1 and CLAS 515D2 are successfully completed in consecutive terms) See CLAS 515D1 for course description.

CLAS 525D1 ANCIENT GREEK AUTHORS. (3) (Prerequisite: 9 credits in Intermediate Greek or equivalent) (Restricted to Honours and Graduate students) (Students must also register for CLAS 525D2) (No credit will be given for this course unless both CLAS 525D1 and CLAS 525D2 are successfully completed in consecutive terms) Completion of a Reading List in Greek, with Faculty supervision, to be tested by written examination.

CLAS 525D2 ANCIENT GREEK AUTHORS. (3) (Prerequisite: CLAS 525D1) (No credit will be given for this course unless both CLAS 525D1 and CLAS 525D2 are successfully completed in consecutive terms) See CLAS 525D1 for course description.

EAST – Asian Lang & Literature

Offered by: Department of East Asian Studies

Former Teaching Unit Code: 117

Departmental approval is required for First level Chinese, First and Second levels Japanese. Any student taking a language course in the Department for the *first time* must see the Department. Departmental approval must be obtained during preregistration period.

EAST 211 INTRODUCTION: EAST ASIAN CULTURE: CHINA. (3) This course provides a critical introduction to central themes in Chinese culture. The course will also examine the changing representations of the Chinese cultural tradition in the West. Readings will include original sources in translation from the fields of literature, philosophy, religion, and cultural history.

EAST 212 INTRODUCTION: EAST ASIAN CULTURE: JAPAN. (3) An introduction to Japan which presents various aspects of Japanese literature, culture, history, religions, philosophy and society.

EAST 213 INTRODUCTION: EAST ASIAN CULTURE: KOREA. (3) This course provides a critical introduction to central themes in Korean culture, including Korean literature, religions, philosophy, and socio-economic formations.

EAST 214 JAPANESE ANIMATION & NEW MEDIA. (3) Animation and new media in Japan, with an emphasis on postwar developments.

● **EAST 220 FIRST LEVEL KOREAN.** (9) (Summer)

EAST 220D1 FIRST LEVEL KOREAN. (4.5) (Students must also register for EAST 220D2) (No credit will be given for this course unless both EAST 220D1 and EAST 220D2 are successfully completed in consecutive terms) (EAST 220D1 and EAST 220D2 together are equivalent to EAST 220) Introduction to the basic structures of the standard Korean language. The aim of this course is to give students a basic knowledge of the Korean language. Special emphasis is put on handling everyday conversation, reading and writing short texts, and mastering basic grammar rules.

EAST 220D2 FIRST LEVEL KOREAN. (4.5) (Prerequisite: EAST 220D1) (No credit will be given for this course unless both EAST 220D1 and EAST 220D2 are successfully completed in consecu-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

tive terms) (EAST 220D1 and EAST 220D2 together are equivalent to EAST 220) See EAST 220D1 for course description.

● **EAST 230 FIRST LEVEL CHINESE.** (9) (Summer) (Requires departmental approval.)

EAST 230D1 FIRST LEVEL CHINESE. (4.5) (Requires departmental approval.) (Students must also register for EAST 230D2) (No credit will be given for this course unless both EAST 230D1 and EAST 230D2 are successfully completed in consecutive terms) (EAST 230D1 and EAST 230D2 together are equivalent to EAST 230) Introduction to the basic structures of Mandarin Chinese, Pin-yin romanization and 750 characters for reading and writing. Emphasis on developing aural and oral skills through communication games and interaction activities. Animated films are used as part of teaching materials.

EAST 230D2 FIRST LEVEL CHINESE. (4.5) (Prerequisite: EAST 230D1) (No credit will be given for this course unless both EAST 230D1 and EAST 230D2 are successfully completed in consecutive terms) (EAST 230D1 and EAST 230D2 together are equivalent to EAST 230) See EAST 230D1 for course description.

● **EAST 240 FIRST LEVEL JAPANESE.** (9) (Summer) (Requires departmental approval.)

EAST 240D1 FIRST LEVEL JAPANESE. (4.5) (Requires Departmental approval) (Students must also register for EAST 240D2) (No credit will be given for this course unless both EAST 240D1 and EAST 240D2 are successfully completed in consecutive terms) (EAST 240D1 and EAST 240D2 together are equivalent to EAST 240) Introduction to the basic grammar and sentence patterns of the Japanese language in both oral and written forms. In reading and writing skills students will be introduced to katakana, hiragana and kanji.

EAST 240D2 FIRST LEVEL JAPANESE. (4.5) (Prerequisite: EAST 240D1) (No credit will be given for this course unless both EAST 240D1 and EAST 240D2 are successfully completed in consecutive terms) (EAST 240D1 and EAST 240D2 together are equivalent to EAST 240) See EAST 240D1 for course description.

EAST 303 CURRENT TOPICS: CHINESE STUDIES 1. (3) (Fall) (Topic in 2003-04: Late Chinese Painting (Mid-Ming to Qing)) Consideration of important issues in Chinese Studies. Content of the course will vary from year to year.

EAST 304 CURRENT TOPICS: CHINESE STUDIES 2. (3) (Winter) (Departmental approval required) Consideration of important issues in Chinese Studies. Content of the course will vary from year to year.

EAST 305 CURRENT TOPICS: JAPANESE STUDIES 1. (3) (Fall) (Departmental approval required) Consideration of important issues in Japanese studies. The content of the course will vary from year to year.

EAST 307 TOPICS: CHINESE LANGUAGE AND LITERATURE. (3) (Fall) (Prerequisite: EAST 211 or permission of instructor) (Departmental approval required) Consideration of selected topics and aspects of Chinese literature and/or language. The content of the course may vary from year to year.

EAST 308 TOPICS: CHINESE LANGUAGE AND LITERATURE. (3) (Winter) (Prerequisite: EAST 211 or permission of instructor) (Departmental approval required) Consideration of selected topics and aspects of Chinese literature and/or language. The content of the course may vary from year to year.

● **EAST 309 PACIFIC ASIA IN THE 20TH CENTURY.** (3)

EAST 313 CURRENT TOPICS: KOREAN STUDIES 1. (3) (Fall) Consideration of important issues in Korean Studies. Content of the course will vary from year to year.

EAST 314 CURRENT TOPICS: KOREAN STUDIES 2. (3) (Winter) (Departmental approval required) Consideration of important issues in Korean Studies. Content of the course will vary from year to year.

● **EAST 315 SURVEY: MODERN KOREAN LITERATURE IN TRANSLATION.** (3)

● **EAST 320 SECOND LEVEL KOREAN.** (9) (Summer) (Prerequisite: EAST 220 or equivalent)

EAST 320D1 SECOND LEVEL KOREAN. (4.5) (Prerequisite: EAST 220 or equivalent) (Students must also register for EAST 320D2) (No credit will be given for this course unless both EAST 320D1 and EAST 320D2 are successfully completed in consecutive terms) (EAST 320D1 and EAST 320D2 together are equivalent to EAST 320) The aim of this course is to give students a fluent speaking ability in daily conversation, advanced grammar knowledge, improved reading and writing skills. Special emphasis is put on the efficient use of grammar, enrichment of vocabulary, and mastering useful expressions encountered in everyday life.

EAST 320D2 SECOND LEVEL KOREAN. (4.5) (Prerequisite: EAST 320D1) (No credit will be given for this course unless both EAST 320D1 and EAST 320D2 are successfully completed in consecutive terms) (EAST 320D1 and EAST 320D2 together are equivalent to EAST 320) See EAST 320D1 for course description.

● **EAST 330 SECOND LEVEL CHINESE.** (9) (Prerequisite: Chinese EAST 230 or equivalent or permission of the instructor)

EAST 330D1 SECOND LEVEL CHINESE. (4.5) (Summer) (Prerequisite: EAST 230 or equivalent or permission of the instructor) (Students must also register for EAST 330D2) (No credit will be given for this course unless both EAST 330D1 and EAST 330D2 are successfully completed in consecutive terms) (EAST 330D1 and EAST 330D2 together are equivalent to EAST 330) The same communicative approach as in EAST 230 is used to develop aural and oral skills on daily topics. In addition to textbooks, Chinese films on videotapes will be incorporated as teaching materials.

EAST 330D2 SECOND LEVEL CHINESE. (4.5) (Prerequisite: EAST 330D1) (No credit will be given for this course unless both EAST 330D1 and EAST 330D2 are successfully completed in consecutive terms) (EAST 330D1 and EAST 330D2 together are equivalent to EAST 330) See EAST 330D1 for course description.

● **EAST 340 SECOND LEVEL JAPANESE.** (9) (Summer) (Prerequisite: Japanese EAST 240 or equivalent or permission of instructor.)

EAST 340D1 SECOND LEVEL JAPANESE. (4.5) (Prerequisite: EAST 240 or equivalent or permission of instructor) (Departmental approval required) (Students must also register for EAST 340D2) (No credit will be given for this course unless both EAST 340D1 and EAST 340D2 are successfully completed in consecutive terms) (EAST 340D1 and EAST 340D2 together are equivalent to EAST 340) Continuation of the study of oral and written Japanese.

EAST 340D2 SECOND LEVEL JAPANESE. (4.5) (Prerequisite: EAST 340D1) (No credit will be given for this course unless both EAST 340D1 and EAST 340D2 are successfully completed in consecutive terms) (EAST 340D1 and EAST 340D2 together are equivalent to EAST 340) See EAST 340D1 for course description.

● **EAST 351 WOMEN IN CHINESE LITERATURE.** (3) (Core course for the Women's Studies program)

EAST 353 20TH CENTURY CHINA IN FILM AND FICTION. (3) This course will study the development of fiction and film in China from the May 4th Movement in 1919 to the present, with a particular focus on the cinematic adaptation of literature. Major themes to be considered will include the family, the changing role of women, and the impact of the West and the 1949 Revolution on modernization and national identity.

EAST 354 TAOIST AND BUDDHIST APOCALYPSES. (3) Visions of the end of the world in Medieval Chinese Buddhist and Taoist literature will be contrasted with Western apocalyptic materials. The course will trace the development of Buddhism and Taoism in China, focusing on millennialist movements, soteriology, public worship, and ritual.

EAST 362 JAPANESE CINEMA. (3) This course will study the development of film in Japan during the 20th century with a particular focus on the analysis of film form, genres and history.

● **EAST 363 AESTHETICS AND POLITICS OF VISION PREMODERN JAPAN.** (3) (Prerequisite: EAST 212 or permission of instructor)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

● **EAST 364 MASS CULTURE AND POSTWAR JAPAN.** (3) (Prerequisite: Any introductory course in literature or cultural studies, or permission of instructor)

● **EAST 366 SURVEY MODERN JAPANESE LITERATURE.** (3)

● **EAST 382 MODERN JAPANESE SOCIETY: PEOPLE AND INSTITUTIONS.** (3) (Prerequisite: Permission of instructor)

● **EAST 384 COMPARATIVE SOCIOECONOMIC HISTORY JAPAN AND KOREA.** (3)

● **EAST 385 SOCIETY AND COMMUNITY IN KOREA.** (3)

EAST 420D1 THIRD LEVEL KOREAN. (3) (Prerequisite: EAST 320 or permission of instructor) (Students must also register for EAST 420D2) (No credit will be given for this course unless both EAST 420D1 and EAST 420D2 are successfully completed in consecutive terms) This course aims at increasing knowledge of grammar, enhancing written and oral comprehension and improving writing and speaking skills.

EAST 420D2 THIRD LEVEL KOREAN. (3) (Prerequisite: EAST 420D1) (No credit will be given for this course unless both EAST 420D1 and EAST 420D2 are successfully completed in consecutive terms) See EAST 420D1 for course description.

● **EAST 430 THIRD LEVEL CHINESE.** (6) (Summer) (Prerequisite: EAST 330 or equivalent or permission of instructor)

EAST 430D1 THIRD LEVEL CHINESE. (3) (Prerequisite: EAST 330 or equivalent or permission of instructor) (Students must also register for EAST 430D2) (No credit will be given for this course unless both EAST 430D1 and EAST 430D2 are successfully completed in consecutive terms) (EAST 430D1 and EAST 430D2 together are equivalent to EAST 430) A communicative approach will be used to provide students with skills to communicate in various situations, express their ideas and feelings, and discuss various aspects of culture and life in China and in Canada. Teaching materials include Chinese movies on videotape and slides depicting Chinese life and culture.

EAST 430D2 THIRD LEVEL CHINESE. (3) (Prerequisite: EAST 430D1) (No credit will be given for this course unless both EAST 430D1 and EAST 430D2 are successfully completed in consecutive terms) (EAST 430D1 and EAST 430D2 together are equivalent to EAST 430) See EAST 430D1 for course description.

EAST 433 CLASSICAL CHINESE 1. (3) (Fall) (Prerequisite: 1 year of modern Chinese or permission of instructor) An introduction to the grammar and syntax of classical Chinese. Readings are selected from well-known Confucian and Taoist classics, and philosophical and historical writings from premodern China.

EAST 434 CLASSICAL CHINESE 2. (3) (Winter) (Prerequisite: EAST 433 or permission of the instructor) Continuation of EAST 433 at a more advanced level.

EAST 440D1 THIRD LEVEL JAPANESE. (3) (Prerequisite: EAST 340 or equivalent or permission of instructor) (Students must also register for EAST 440D2) (No credit will be given for this course unless both EAST 440D1 and EAST 440D2 are successfully completed in consecutive terms) More advanced study of the Japanese language. Emphasis will be placed on reading.

EAST 440D2 THIRD LEVEL JAPANESE. (3) (Prerequisite: EAST 440D1) (No credit will be given for this course unless both EAST 440D1 and EAST 440D2 are successfully completed in consecutive terms) See EAST 440D1 for course description.

EAST 453 HISTORY OF CHINESE FICTION. (3) (Prerequisite: EAST 211 or permission of instructor) A study of Chinese narrative and fictional writings, with emphasis on the novels of the Ming and Qing dynasties. Analysis will focus on issues of structure, theme, class, and gender.

● **EAST 456 CHINESE DRAMA AND POPULAR CULTURE.** (3) (Prerequisite: EAST 211 or permission of instructor)

EAST 461 INVENTING MODERN JAPANESE NOVEL. (3) (Prerequisite: Any course in literature or cultural studies above the introductory level, or permission of instructor) An examination of the modern Japanese novel as a form which both affirms and resists the form of the European novel. Readings explore the particular

problems of the Japanese novel in the context of modernization, westernization, and colonialism.

● **EAST 462 JAPAN IN ASIA.** (3) (Prerequisite: Any East Asian Studies course above the introductory level, or permission of the instructor)

● **EAST 466 FEMINISM AND JAPAN.** (3) (Prerequisite: Any East Asian Studies course above the introductory level, or permission of instructor)

● **EAST 467 TOPICS: JAPANESE CINEMA.** (3) (Prerequisites: EAST 214, EAST 362 or permission of the instructor.)

● **EAST 484 COMMUNITIES AND CHANGE IN JAPAN.** (3) (Prerequisite: EAST 382 or permission of instructor)

EAST 491 TUTORIAL: EAST ASIAN LANGUAGES AND LITERATURES. (3) (Fall) (Departmental approval required) Advanced reading course in language or literature.

EAST 492 TUTORIAL: EAST ASIAN LANGUAGES AND LITERATURES. (3) (Winter) (Departmental approval required) Advanced reading course in language or literature.

EAST 493 SPECIAL TOPICS: EAST ASIAN STUDIES 1. (3) (Fall) (Prerequisite: Any EAST course at the 300-level or above or permission of instructor) (Departmental approval required) Advanced reading course under supervision of instructor on certain aspects of East Asian Studies. Topics will vary from year to year.

EAST 494 SPECIAL TOPICS: EAST ASIAN STUDIES 1. (3) (Winter) (Prerequisite: Any EAST course at the 300-level or above or permission of instructor) (Departmental approval required) Advanced reading course under supervision of instructor on certain aspects of East Asian Studies. Topics will vary from year to year.

EAST 495D1 JOINT HONOURS THESIS: EAST ASIAN STUDIES. (1.5) (Prerequisite: U3 Joint Honours status and permission of instructor) (Departmental approval required) (Students must also register for EAST 495D2) (No credit will be given for this course unless both EAST 495D1 and EAST 495D2 are successfully completed in consecutive terms) Supervised reading and preparation of an Honours thesis under the direction of a member of staff.

EAST 495D2 JOINT HONOURS THESIS: EAST ASIAN STUDIES. (1.5) (Prerequisite: EAST 495D1) (No credit will be given for this course unless both EAST 495D1 and EAST 495D2 are successfully completed in consecutive terms) See EAST 495D1 for course description.

May also be offered as: EAST 495N1 and EAST 495N2

EAST 498D1 HONOURS THESIS: EAST ASIAN STUDIES. (3) (Prerequisite: U3 Honours status and permission of the instructor) (Departmental approval required) (Students must also register for EAST 498D2) (No credit will be given for this course unless both EAST 498D1 and EAST 498D2 are successfully completed in consecutive terms) Supervised reading and preparation of an Honours thesis under the direction of a member of staff.

EAST 498D2 HONOURS THESIS: EAST ASIAN STUDIES. (3) (Prerequisite: EAST 498D1) (No credit will be given for this course unless both EAST 498D1 and EAST 498D2 are successfully completed in consecutive terms) See EAST 498D1 for course description.

May also be offered as: EAST 498N1 and EAST 498N2

EAST 501 ADVANCED TOPICS IN JAPANESE STUDIES 1. (3) (Fall) (Prerequisite: permission of instructor) (Departmental approval required) Consideration of selected topics and aspects of Japanese culture and society.

EAST 502 ADVANCED TOPICS IN JAPANESE STUDIES 2. (3) (Winter) (Prerequisite: permission of instructor) Consideration of selected topics and aspects of Japanese culture and society.

EAST 503 ADVANCED TOPICS IN CHINESE STUDIES 1. (3) (Fall) (Prerequisite: permission of instructor) Consideration of selected topics and aspects of Chinese culture and society.

EAST 504 ADVANCED TOPICS IN CHINESE STUDIES 2. (3) (Winter) (Prerequisite: permission of instructor) (Departmental approval required) Consideration of selected topics and aspects of Chinese culture and society.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

EAST 515 SEMINAR: BEYOND ORIENTALISM. (3) (Prerequisite: any EAS course at the 300-level or above or permission of instructor) Examines the cultural stakes and ethical implications of applying Western European models of understanding to East Asian societies. Provides background on interdisciplinary debates around "otherness", "cultural appropriation", and "postcolonialism", focusing on their history within East Asian Studies and their impact on that field's methodological assumptions, self-definition, and institutional practices.

● **EAST 529 CONTEMPORARY CHINA: ANALYSIS OF CHANGE.** (3) (Not open to students who have taken ANTH 329)

● **EAST 530 FOURTH LEVEL CHINESE.** (6) (Summer) (Prerequisite: EAST 430 or equivalent)

EAST 530D1 FOURTH LEVEL CHINESE. (3) (Prerequisite: EAST 430 or equivalent) (Students must also register for EAST 530D2) (No credit will be given for this course unless both EAST 530D1 and EAST 530D2 are successfully completed in consecutive terms) (EAST 530D1 and EAST 530D2 together are equivalent to EAST 530) Development of skills required to conduct academic discussions in oral as well as in written forms. Teaching materials include original texts from Chinese newspapers, Chinese literature and videos.

EAST 530D2 FOURTH LEVEL CHINESE. (3) (Prerequisite: EAST 530D1) (No credit will be given for this course unless both EAST 530D1 and EAST 530D2 are successfully completed in consecutive terms) (EAST 530D1 and EAST 530D2 together are equivalent to EAST 530) See EAST 530D1 for course description.

● **EAST 535 CHINESE FOR BUSINESS 1.** (3) (Prerequisite: EAST 330 or equivalent or permission of instructor)

● **EAST 536 CHINESE FOR BUSINESS 2.** (3) (Prerequisite: EAST 535 or equivalent or permission of instructor)

EAST 537D1 CHINA TODAY THROUGH TRANSLATION. (3) (Prerequisite: students with native or near native proficiency may register directly, other students require permission of instructor) (Not open to students who have taken EAST 437) (Students must also register for EAST 537D2) (No credit will be given for this course unless both EAST 537D1 and EAST 537D2 are successfully completed in consecutive terms) A course to develop practical translation skills and understanding of contemporary China, focusing on Sino-Canadian and multi-lateral political, cultural and trade issues. Interpretive skills will be enhanced through translation exercises and discussion in class. Course materials include original documents and videos from the business communications and other fields.

EAST 537D2 CHINA TODAY THROUGH TRANSLATION. (3) (Prerequisite: EAST 537D1) (No credit will be given for this course unless both EAST 537D1 and EAST 537D2 are successfully completed in consecutive terms) See EAST 537D1 for course description.

EAST 540D1 FOURTH LEVEL JAPANESE. (3) (Prerequisite: EAST 440 or equivalent or permission of instructor) (Students must also register for EAST 540D2) (No credit will be given for this course unless both EAST 540D1 and EAST 540D2 are successfully completed in consecutive terms) Advanced study of Japanese, with emphasis on reading Japanese newspapers. Classes will be conducted entirely in Japanese.

EAST 540D2 FOURTH LEVEL JAPANESE. (3) (Prerequisite: EAST 540D1) (No credit will be given for this course unless both EAST 540D1 and EAST 540D2 are successfully completed in consecutive terms) See EAST 540D1 for course description.

EAST 543 CLASSICAL JAPANESE 1. (3) (Prerequisite: EAST 440 or permission of instructor) The course will offer an introduction to the grammar and syntax of classical Japanese. Readings of well-known pre-modern writings.

EAST 544 CLASSICAL JAPANESE 2. (3) (Prerequisite: EAST 543 or permission of instructor) The grammar and syntax of classical Japanese. Readings in well-known writings of pre-modern Japan.

EAST 547 ADVANCED READING AND TRANSLATION IN JAPANESE. (3) (Prerequisite: EAST 440 or permission of the instructor) This course is designed to improve students' skills in reading and trans-

lating Japanese. Readings will be taken from various novels, short stories and articles. Translation from Japanese to English or French.

● **EAST 550 CLASSICAL CHINESE POETRY THEMES AND GENRES.** (3) (Prerequisite: EAST 433 or permission of instructor)

EAST 559 ADVANCED TOPICS: CHINESE LITERATURE. (3) (Prerequisite: one advanced course in EAST or permission of instructor) (Departmental approval required) Consideration of selected topics and aspects of Chinese literature. The content of the course may vary from year to year, ranging from contemporary to modern to pre-modern literature.

● **EAST 563 IMAGES, IDEOGRAMS, AESTHETICS.** (3) (Prerequisite: EAST 320 or EAST 330 or EAST 340 or equivalent, or permission of instructor)

EAST 564 STRUCTURES OF MODERNITY: JAPAN. (3) (Prerequisite: Any East Asian Studies course above the introductory level, or permission of the instructor) This course explores relations between some of the principal sites which structure the experience of "modernity" in Japan (and elsewhere) - from bodies and cities, to the urban context in general. Along with general approaches (e.g. the idea of everyday life; questions of time), specific topics may include speed, music, architecture, crime, etc.

● **EAST 569 ADVANCED TOPICS: JAPANESE LITERATURE.** (3) (Prerequisite: one advanced course in EAS or permission of instructor) (Departmental approval required)

● **EAST 582 JAPANESE CULTURE AND SOCIETY.** (3)

● **EAST 590 MULTIPLE NARRATIVES OF "ORIENT".** (3) (Prerequisite: A literature course above the introductory level in EAS or permission of instructor)

ECON – Economics (Arts)

Offered by: Department of Economics

Former Teaching Unit Code: 154

The combination of ECON 208 and ECON 209 is a prerequisite for all 300-level courses in Economics. **(It should be noted that in all of the course listings below where the combination of ECON 208 and ECON 209 are listed as prerequisites or corequisites, the combination of MGCR 293 and ECON 295 or the more advanced courses ECON 230D1/ECON 230D2 or ECON 250D1/ECON 250Ds serve as acceptable prerequisites or corequisites.)**

400-level courses generally require at least ECON 230D1/ECON 230D2 as a prerequisite. Students whose previous training is deemed adequate for taking specific courses at the 300 or 400-level may be exempted from listed prerequisites by explicit permission of the instructor.

Non-Honours students are not permitted to register in courses specifically designated as Honours courses without authorization from the course instructor.

ECON 199 FYS: THE ROLE OF GOVERNMENT. (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) An examination of the evolving interaction of government, society and economy in practice and in the realm of ideas. Discussion will include current rethinking arising from globalization. Course home page: vm1.mcgill.ca/~inmf/http/econ199.htm.

● **ECON 205 AN INTRODUCTION TO POLITICAL ECONOMY.** (3) (Not open to students who have taken 154-205D) (This course does not count for credit toward the Major or Honours degree in Economics)

ECON 208 MICROECONOMIC ANALYSIS AND APPLICATIONS. (3) (Not open to students who have taken or are taking ECON 230 or ECON 250) A university-level introduction to demand and supply, consumer behaviour, production theory, market structures and income distribution theory.

ECON 209 MACROECONOMIC ANALYSIS AND APPLICATIONS. (3) (Prerequisites: ECON 208 or permission of the instructor) (Not

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

open to students who have taken or are taking ECON 330 or ECON 352) A university-level introduction to national income determination, money and banking, inflation, unemployment and economic policy.

ECON 219 CURRENT ECONOMIC PROBLEMS: TOPICS. (3) (This course will also be of interest to students outside of Economics) This course will deal with topical issues of importance to the Canadian economy.

ECON 223 POLITICAL ECONOMY OF TRADE POLICY. (3) (Prerequisite: ECON 208) The course introduces students to the economics of international trade, what constitutes good trade policy, and how trade policy is decided. The course examines Canadian trade policy since 1945, including the GATT, Auto Pact, the FTA and NAFTA, and concludes with special topics in trade policy.

ECON 225 ECONOMICS OF THE ENVIRONMENT. (3) (Not open to students who have taken 154-325 or 154-425) A study of the application of economic theory to questions of environmental policy. Particular attention will be given to the measurement and regulation of pollution, congestion and waste and other environmental aspects of specific economies.

ECON 227 ECONOMIC STATISTICS. (6) (Credit for other statistics courses may preclude credit for this course and conversely. Please see regulations concerning statistics courses under Course Information in the Faculty General Information section) Distributions, averages, dispersions, sampling, testing, estimation, correlation, regression, index numbers, trends and seasonals.

ECON 227D1 ECONOMIC STATISTICS. (3) (Students must also register for ECON 227D2) (No credit will be given for this course unless both ECON 227D1 and ECON 227D2 are successfully completed in consecutive terms) (ECON 227D1 and ECON 227D2 together are equivalent to ECON 227) (Credit for other statistics courses may preclude credit for this course and conversely. Please see regulations concerning statistics courses under Course Information in the Faculty General Information section) Distributions, averages, dispersions, sampling, testing, estimation, correlation, regression, index numbers, trends and seasonals.

ECON 227D2 ECONOMIC STATISTICS. (3) (Prerequisite: ECON 227D1) (No credit will be given for this course unless both ECON 227D1 and ECON 227D2 are successfully completed in consecutive terms) (ECON 227D1 and ECON 227D2 together are equivalent to ECON 227) (Credit for other statistics courses may preclude credit for this course and conversely. Please see regulations concerning statistics courses under Course Information in the Faculty General Information section) See ECON 227D1 for course description.

ECON 230D1 MICROECONOMIC THEORY. (3) (Students must also register for ECON 230D2) (No credit will be given for this course unless both ECON 230D1 and ECON 230D2 are successfully completed in consecutive terms) The introductory course for Economics Major students in microeconomic theory. In depth and critical presentation of the theory of consumer behaviour, theory of production and cost curves, theory of the firm, theory of distribution, welfare economics and the theory of general equilibrium.

ECON 230D2 MICROECONOMIC THEORY. (3) (Prerequisite: ECON 230D1) (No credit will be given for this course unless both ECON 230D1 and ECON 230D2 are successfully completed in consecutive terms) See ECON 230D1 for course description.

ECON 250D1 INTRODUCTION TO ECONOMIC THEORY: HONOURS. (3) (MATH 139 and MATH 141 are corequisites) (Students must also register for ECON 250D2) (No credit will be given for this course unless both ECON 250D1 and ECON 250D2 are successfully completed in consecutive terms) An intermediate level microeconomics course. Includes theory of exchange, theory of consumer behaviour, theory of production and cost curves, theory of the firm, theory of distribution; general equilibrium and welfare economics. The assumptions underlying the traditional neo-classical approach to economic theory will be carefully specified.

ECON 250D2 INTRODUCTION TO ECONOMIC THEORY: HONOURS. (3) (Prerequisite: ECON 250D1) (No credit will be given for this course

unless both ECON 250D1 and ECON 250D2 are successfully completed in consecutive terms) See ECON 250D1 for course description.

ECON 257D1 ECONOMIC STATISTICS - HONOURS. (3) (Corequisites: MATH 141 and MATH 133 and ECON 250) (Not open to students who have taken 154-357 or are taking ECON 217 or ECON 227. Credit for other statistics courses may preclude credit for this course and conversely. Please see regulations concerning statistics courses under Course Information in the Faculty General Information section) (Students must also register for ECON 257D2) (No credit will be given for this course unless both ECON 257D1 and ECON 257D2 are successfully completed in consecutive terms) Stochastic phenomena; probability and frequency distributions, introduction to probability theory. Statistical inference about proportions, means and variances; analysis of variance; nonparametric statistics; index numbers and time series; economic forecasting; regression and correlation analysis; introduction to general linear models, its uses and limitations; uses and misuses of statistics.

ECON 257D2 ECONOMIC STATISTICS - HONOURS. (3) (Prerequisite: ECON 257D1) (No credit will be given for this course unless both ECON 257D1 and ECON 257D2 are successfully completed in consecutive terms) See ECON 257D1 for course description.

ECON 295 MACROECONOMIC POLICY. (3) (Corequisite: MGCR 293) (Restricted to B.Com. students) (Not open to students who have taken or are taking ECON 330 or ECON 352) (Continuing Education: requirement for CMA, CGA, I.C.B., the EA of AACI, and the CRA) (Continuing Education: not open to full-time day students) This applied macroeconomics course focuses on current and recurrent macroeconomic issues important in understanding the public policy environment in which firms make their decisions. Topics include national accounts; national income determination; economic growth and fluctuations; money, monetary policy and financial markets; international trade and finance.

ECON 302 MONEY AND BANKING. (6) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) Principles of money, banking and central banking covering the nature of money, measurement of money supply, determination of quantity of money; sources of bank funds, uses of bank funds, nature of central banking, monetary policy and the international payments system.

ECON 302D1 MONEY AND BANKING. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) (Students must also register for ECON 302D2) (No credit will be given for this course unless both ECON 302D1 and ECON 302D2 are successfully completed in consecutive terms) (ECON 302D1 and ECON 302D2 together are equivalent to ECON 302) Principles of money, banking and central banking covering the nature of money, measurement of money supply, determination of quantity of money; sources of bank funds, uses of bank funds, nature of central banking, monetary policy and the international payments system.

ECON 302D2 MONEY AND BANKING. (3) (Prerequisite: ECON 302D1) (No credit will be given for this course unless both ECON 302D1 and ECON 302D2 are successfully completed in consecutive terms) (ECON 302D1 and ECON 302D2 together are equivalent to ECON 302) See ECON 302D1 for course description.

ECON 305 INDUSTRIAL ORGANIZATION. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) (Not open to students who have taken ECON 305) The course analyzes the structure, conduct, and performance of industries, particularly but not exclusively in Canada. Topics include effects of mergers, barriers to entry, product line and promotion policies, vertical integration, and R & D policies of firms.

ECON 306D1 LABOUR ECONOMICS AND INSTITUTIONS. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) (Students must also register for ECON 306D2) (No credit will be given for this course unless both ECON 306D1 and ECON 306D2 are successfully completed in consecutive terms) Key features of the Canadian labour sector effects and its historical development are described. Economists' ideas about the labour sector are sketched. The labour sector of various public programs,

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

unemployment, and the labour movement are examined. Much attention is given to the status of women in the labour sector.

ECON 306D2 LABOUR ECONOMICS AND INSTITUTIONS. (3) (Prerequisite: ECON 306D1) (No credit will be given for this course unless both ECON 306D1 and ECON 306D2 are successfully completed in consecutive terms) See ECON 306D1 for course description.

ECON 308 GOVERNMENTAL POLICY TOWARDS BUSINESS. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) (Not open to students who have taken 154-305D) Covers the major public policies toward business in Canada, such as competition policy, regulation, public ownership and privatization, industrial policies, and trade policies. Includes comparison with policies of other countries, especially the U.S. Readings will include some legal decisions.

ECON 311 UNITED STATES ECONOMIC DEVELOPMENT. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) A survey of economic growth and institutional change in the United States. Emphasis will be placed on the use of analytical methods and categories and theories economists have developed for such studies.

ECON 313 ECONOMIC DEVELOPMENT 1. (3) (Prerequisite: ECON 208 and either ECON 209 or one development course.) (Not open to students who have taken 154-313D.) Microeconomic theories of economic development and empirical evidence on population, labour, firms, poverty. Inequality and environment.

ECON 314 ECONOMIC DEVELOPMENT 2. (3) (Prerequisite: ECON 313) (Not open to students who have taken 154-313D) Macroeconomic development issues, including theories of growth, public finance, debt, currency crises, corruption, structural adjustment, democracy and global economic organization.

● **ECON 316 THE UNDERGROUND ECONOMY.** (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above)

● **ECON 318 THE CRIMINAL ECONOMY.** (3) (Prerequisite: ECON 316.) (Departmental approval required)

● **ECON 321 THE QUEBEC ECONOMY.** (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above)

● **ECON 326 ECOLOGICAL ECONOMICS.** (3) (Prerequisites: ECON 208 and ECON 209 or consent of instructor)

● **ECON 329 ECONOMICS OF CONFEDERATION.** (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) (Not open to students who have taken ECON 429)

ECON 330D1 MACROECONOMIC THEORY. (3) (Prerequisite: ECON 230 or ECON 250. If a student has already taken 154-200 or 154-203 and 154-204 or ECON 208 and ECON 209, it may be concurrently taken with ECON 230 with the permission of the instructor) (Students must also register for ECON 330D2) (No credit will be given for this course unless both ECON 330D1 and ECON 330D2 are successfully completed in consecutive terms) A review of basic economic concepts and tools with an in depth and critical presentation of the fundamental areas of macroeconomic theory. Topics include: the determination of output, employment and price level; money and banking and business cycles; stabilization policy; international finance and growth theory.

ECON 330D2 MACROECONOMIC THEORY. (3) (Prerequisite: ECON 330D1) (No credit will be given for this course unless both ECON 330D1 and ECON 330D2 are successfully completed in consecutive terms) See ECON 330D1 for course description.

ECON 331 ECONOMIC DEVELOPMENT: RUSSIA AND USSR. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) This course examines the Soviet economy, its origins, structure, and attempted reforms. The transition of Russia to a market-oriented economic system and its current economic performance is discussed and evaluated.

ECON 334 HISTORY OF ECONOMIC DOCTRINES. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) The course surveys the development of economics, how

the discipline and the thinking of economists evolved, and the significance of some of the analytical tools used.

● **ECON 335 THE JAPANESE ECONOMY.** (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above)

ECON 337 INTRODUCTORY ECONOMETRICS 1. (3) (Prerequisite: a grade of 65% or better in ECON 227 or ECON 257 or ECON 317 or ECON 357 or an equivalent qualification in statistics. Familiarity with matrix algebra is highly recommended) The practical application of quantitative methods in statistical investigations.

ECON 340 EX-SOCIALIST ECONOMIES. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) The course examines the structural and institutional changes in economies in transition from central planning to market allocation and evaluates the current experiences of the countries of the former USSR and East-Central Europe.

● **ECON 344 THE INTERNATIONAL ECONOMY 1830-1914.** (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above)

ECON 345 THE INTERNATIONAL ECONOMY SINCE 1914. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) Studies the history of economic adjustments in the 20th century, with particular reference to the industrialized countries. Topics include: the economic impact of WWI, the attempts to revive the international economy in the 1920s, the causes and consequences of the Great Depression of the 1930s, and the economic problems and subsequent economic boom following WWII.

ECON 347 ECONOMICS OF CLIMATE CHANGE. (3) (Prerequisites: ECON 208 and ECON 209 or those listed under Prerequisites above) The course focuses on the economic implications of, and problems posed by, predictions of global warming due to anthropogenic emissions of greenhouse gases. Attention is given to economic policies such as carbon taxes and tradeable emission permits and to the problems of displacing fossil fuels with new energy technologies.

ECON 352D1 MACROECONOMICS-HONOURS. (3) (Prerequisite: ECON 250D1/ECON 250D2. Corequisite ECON 257D1.) (Students must also register for ECON 352D2) (No credit will be given for this course unless both ECON 352D1 and ECON 352D2 are successfully completed in consecutive terms) Basic macroeconomic theory, emphasizing the Classical and Keynesian ideas for the short-run determination of output, employment, interest rates and prices in the economy. Elements of international economics, money and banking and growth theory. The structure of the Canadian economy.

ECON 352D2 MACROECONOMICS-HONOURS. (3) (Prerequisite: ECON 352D1. Corequisite: ECON 357D2.) (No credit will be given for this course unless both ECON 352D1 and ECON 352D2 are successfully completed in consecutive terms) See ECON 352D1 for course description.

ECON 405 NATURAL RESOURCE ECONOMICS. (3) (Prerequisite: ECON 230 or ECON 250) Topics include: Malthusian and Ricardian Scarcity; optimal depletion of renewable and non-renewable resources; exploration, risk and industry structure, and current resources, rent and taxation. Current public policies applied to the resource industries, particularly those of a regulatory nature.

ECON 406 TOPICS IN ECONOMIC POLICY. (3) (Prerequisites: ECON 230 or ECON 250 and one of ECON 227, ECON 257) Selected policy issues are investigated using economic theory. For details on topics covered in the current year, consult the instructor.

ECON 408D1 PUBLIC SECTOR ECONOMICS. (3) (Prerequisite: ECON 230D1/ECON 230D2 or ECON 250D1/ECON 250D2.) (Students must also register for ECON 408D2) (No credit will be given for this course unless both ECON 408D1 and ECON 408D2 are successfully completed in consecutive terms) A survey of the economists' view of government activity. The theory of public spending and various modes of taxation is emphasized. Canadian institutions are viewed in an analytical perspective.

ECON 408D2 PUBLIC SECTOR ECONOMICS. (3) (Prerequisite: ECON 408D1) (No credit will be given for this course unless both

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ECON 408D1 and ECON 408D2 are successfully completed in consecutive terms) See ECON 408D1 for course description.

● **ECON 411 ECONOMIC DEVELOPMENT: A WORLD AREA.** (3) (Prerequisites: ECON 230 or ECON 250 and one semester of economic development)

ECON 412 TOPICS IN ECONOMIC DEVELOPMENT 1. (3) (Prerequisites: ECON 230 or ECON 250 and one semester of economic development) Topic for Fall 2001: An examination of proposals for reform of the international institutional framework for economic development. Course homepage: vm1.mcgill.ca/~inmf/http/econ412.htm.

ECON 416 TOPICS IN ECONOMIC DEVELOPMENT 2. (3) (Prerequisite: ECON 230 or ECON 250 or permission of the instructor) This course gives students a broad overview of the economics of developing countries. The course covers micro and macro topics, with particular emphasis on the economic analysis at the micro level.

● **ECON 420 TOPICS IN ECONOMIC THEORY.** (3) (Prerequisite: ECON 230 or ECON 250)

ECON 423D1 INTERNATIONAL TRADE AND FINANCE. (3) (Prerequisite: ECON 230D1/ECON 230D2 or ECON 250D1/ECON 250D2. Corequisite: ECON 330D1 or ECON 352D1.) (Students must also register for ECON 423D2) (No credit will be given for this course unless both ECON 423D1 and ECON 423D2 are successfully completed in consecutive terms) Theoretical and policy approach to the study of international economic relations. Topics examined include: trade theory; tariff theory; trade and growth; balance of payments; adjustment; international monetary system.

ECON 423D2 INTERNATIONAL TRADE AND FINANCE. (3) (Corequisite: ECON 330D2 or ECON 352D2.) (No credit will be given for this course unless both ECON 423D1 and ECON 423D2 are successfully completed in consecutive terms) See ECON 423D1 for course description.

ECON 426 LABOUR ECONOMICS. (3) (Prerequisite: Economics Majors or Honours students ECON 230 or ECON 250; non-Economics students ECON 306) The determinants of labour supply, demand and the structure of earnings are considered. The economic effects of government policies, such as minimum wage laws, unemployment insurance, welfare and training programs and subsidies to higher education are analyzed. A rigorous theoretical and "hands on" empirical approach is emphasized.

ECON 434 CURRENT ECONOMIC PROBLEMS. (3) (Prerequisite: ECON 230 or ECON 250. Corequisite: ECON 330 or ECON 352) A discussion of contemporary economic problems. Topics will reflect economic issues of current interest.

ECON 440 HEALTH ECONOMICS. (3) (Prerequisites: ECON 208 and ECON 227 or comparable courses or consent of the instructor) The organization and performance of Canada's health care system are examined from an economists' perspective. The system is described and its special features analyzed. Much attention is given to the role of government in the system and to financing arrangements for hospital and medical services. Current financial problems are discussed.

● **ECON 447 ECONOMICS OF INFORMATION AND UNCERTAINTY.** (3) (Prerequisite: ECON 230 or ECON 250)

ECON 450D1 ADVANCED ECONOMIC THEORY - HONOURS. (3) (Prerequisites: ECON 250D1/ECON 250D2 and ECON 352D1/ECON 352D2) (Students must also register for ECON 450D2) (No credit will be given for this course unless both ECON 450D1 and ECON 450D2 are successfully completed in consecutive terms) Selected topics in economic theory from recent periodical and monograph literature.

ECON 450D2 ADVANCED ECONOMIC THEORY - HONOURS. (3) (Prerequisite: ECON 450D1) (No credit will be given for this course unless both ECON 450D1 and ECON 450D2 are successfully completed in consecutive terms) See ECON 450D1 for course description.

ECON 451 SEMINAR IN ECONOMIC HISTORY. (3) (Prerequisites: one of ECON 227, ECON 317, ECON 257 or ECON 357 and either

ECON 330 or ECON 352) In this course economic theory is explicitly employed to elucidate issues in economic history. The topics will be announced at the beginning of the academic year.

ECON 453D1 INTERNATIONAL ECONOMICS - HONOURS. (3) (Prerequisites: ECON 250D1/ECON 250D2 and ECON 352D1/ECON 352D2) (Students must also register for ECON 453D2) (No credit will be given for this course unless both ECON 453D1 and ECON 453D2 are successfully completed in consecutive terms) The pure theory of trade; Ricardian, Heckscher-Ohlin-Samuelson models; tariff theory and policy; the Canadian balance of payments; balance of payments disequilibrium analysis and policy; the exchange rate, international monetary economics, international policy coordination.

ECON 453D2 INTERNATIONAL ECONOMICS - HONOURS. (3) (Prerequisite: ECON 453D1) (No credit will be given for this course unless both ECON 453D1 and ECON 453D2 are successfully completed in consecutive terms) See ECON 453D1 for course description.

ECON 459 TOPICS IN MONETARY ECONOMICS - HONOURS. (3) (Prerequisite: ECON 230 or ECON 250, and knowledge of calculus. For Honours in Economics) (Not open to students who have taken ECON 458) (In 2001-02, ECON 459 will be taught jointly with ECON 623) An advanced treatment of selected topics in monetary economics, including the theory and practice of monetary policy.

ECON 460 HISTORY OF THOUGHT 1 - HONOURS. (3) (Prerequisite: ECON 250. Corequisite: ECON 352) The evolution of economic thought prior to the close of the 19th century, as reflected in the writings of prominent economists from the time of Adam Smith to the emergence of marginalism and neoclassical economics.

ECON 461 HISTORY OF THOUGHT 2 - HONOURS. (3) (Prerequisite: ECON 250. Corequisite: ECON 352) The evolution of economic thought in the 20th century, as reflected in the writings of prominent economists on equilibrium, dynamics, games, expectations, econometrics, industrial structure, economic policy and other primary areas of interest.

ECON 467D1 ECONOMETRICS - HONOURS. (3) (Prerequisites: MATH 222 and ECON 257D1/ECON 257D2 or consent of instructor) (Students must also register for ECON 467D2) (No credit will be given for this course unless both ECON 467D1 and ECON 467D2 are successfully completed in consecutive terms) Special emphasis on statistical tests of economic theories, the construction of econometric models, and problems in estimation methods.

ECON 467D2 ECONOMETRICS - HONOURS. (3) (Prerequisite: ECON 467D1) (No credit will be given for this course unless both ECON 467D1 and ECON 467D2 are successfully completed in consecutive terms) See ECON 467D1 for course description.

ECON 480 RESEARCH PROJECT. (3) (Open to U3 students only. Note: Students must complete a Research Project Registration Form, have it countersigned by the professor who has agreed to supervise the research project and submit it to the Departmental Administrative Officer in Leacock 442 prior to registering in this course) (A student cannot take this course more than once for credit) In this course students must undertake a research project under close supervision. They must also do such special reading and research as their advisers direct.

ECON 481 RESEARCH PROJECT. (3) (Open to U3 students only. Note: Students must complete a Research Project Registration Form, have it countersigned by the professor who has agreed to supervise the research project and submit it to the Departmental Administrative Officer in Leacock 442 prior to registering in this course) (A student cannot take this course more than once for credit) In this course students must undertake a research project under close supervision. They must also do such special reading and research as their advisers direct.

ECON 525 PROJECT ANALYSIS. (3) (Open to advanced undergraduate students. Prerequisite: ECON 250, ECON 352 or equivalent) A course in cost benefit analysis for graduate and advanced undergraduate students.

ECON 534 PENSION CRISIS. (3) The consequences of commitments made by governments in the area of old age pensions and

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

the implications of the resulting tax burden. An international perspective will be adopted.

ECON 546 GAME THEORY. (3) (Prerequisite: ECON 230 or ECON 250) (Not open to students who have taken ECON 446. Open to advanced undergraduate students) This course introduces students to game theory, the branch of the social sciences that focuses on the formal modelling and analysis of human interactions and strategic behaviour. Basic concepts in cooperative and non-cooperative games are applied to economic models.

● **ECON 567 COMPLEX & INTERACTIVE SYSTEMS.** (3) (Prerequisites: ECON 250, ECON 352) (Restrictions: For Honours and Graduate students in Economics. Permission of the instructor.)

ECON 577 MATHEMATICAL ECONOMICS 1. (3) (Prerequisites: MATH 133, MATH 139 and MATH 141 or equivalent) A mathematical treatment of basic economic theory.

● **ECON 578 MATHEMATICAL ECONOMICS 2.** (3) (Prerequisite: ECON 577)

EFRL – English and French Language

Offered by: English and French Language Centre
Former Teaching Unit Code: 124

The English for academic purposes course, EFRL 250 Fundamentals of Academic Writing, develops *academic* writing and critical thinking skills. The course is for native speakers of English. Near-native English speakers may also take the course, but students with less than advanced English Second Language (ESL) skills are advised to take the academic writing courses listed under ESLN (English as a Second Language).

NOTE: All students are required to attend class without fail during the first two weeks. Should registration for any course exceed the space available and should more space become available, the students who attend on a regular basis will be given priority.

EFRL 250 FUNDAMENTALS OF ACADEMIC WRITING. (3) (3 hours.) (Intended for native speakers of English.) (Entrance tests: Short composition first day of class.) For undergraduate students in all years and faculties. Academic writing as a genre of writing: audience, purpose, organization, style. Critical thinking, reading, and writing skills. In-class textual analysis, summary, and critique. Writing mechanics/editing. Library research techniques. Research paper. Multiple drafts. Extensive individual feedback including audio-taped commentary.

ENGC – English Communications

Offered by: Department of Art History and Communication Studies
Former Teaching Unit Code: 109

ENGC 200 COMMUNICATIONS - PRE-ELECTRONIC AGE. (3) (Not open to students who have taken ENGL 277) The social and cultural implications of major developments in communications from prehistory to the start of the electronic age. Topics will include the origins of symbolic expression, nonalphabetic versus alphabet writing, the development of printing, and emergence of the telegraph. The orality/literacy developments during this period will also be explored.

ENGC 210 COMMUNICATIONS - ELECTRONIC AGE. (3) (Not open to students who have taken ENGL 278) The social and cultural implications of major developments in mass communications from the onset of the electronic era to the present. Topics will include the development of, and popular responses to, the telegraph, the telephone, photography and visual media, radio and television broadcasting, including the current debates on new media technologies.

ENGC 521 COMMUNICATIONS IN HISTORY. (3) North American communication studies have undergone five discernible changes in the definition and focus of the field. The major "schools" of thought to be covered are the Chicago and Lazarsfeld heritages, the institu-

tionalization of communication science in the academy, and the post-modern period.

ENGC 541 CULTURAL INDUSTRIES. (3) The convergence of computerized technologies and cultural industries and how these have produced entire new forms of cultural expression in film, TV, and the Internet.

ENGL – English (Arts)

Offered by: Department of English
Former Teaching Unit Code: 110

Courses with enrolment limited by program. Most ENGL courses are open to all McGill students, but some courses have priority given to students in English Department programs. Information about applying for such courses is available in the English Department General Office or on the Department Website.

500-level courses offer advanced study in seminar format of special topics as indicated by course titles. Enrolment is limited to 15 graduate and advanced undergraduate students. Admission by permission of the instructor.

ENGL 199 FYS: LITERATURE AND DEMOCRACY. (3) (Open only to newly admitted students in U0 or U1. Students may take only one First Year Seminar. Students who register for more than one will be removed from all but one of them.) (Maximum 25)

● **ENGL 200 SURVEY OF ENGLISH LITERATURE 1.** (3) (Not open to students in English programs)

ENGL 201 SURVEY OF ENGLISH LITERATURE 2. (3) (Prerequisite: ENGL 200 or permission of instructor) (Not open to students in English programs)

ENGL 202 DEPARTMENTAL SURVEY OF ENGLISH LITERATURE 1. (3) (Fall) (Limited to students in English programs only) (Not open to students who have taken ENGL 200)

ENGL 203 DEPARTMENTAL SURVEY OF ENGLISH LITERATURE 2. (3) (Winter) (Prerequisite: ENGL 202 or permission of instructor. Limited to students in English programs only) (Not open to students who have taken ENGL 201)

ENGL 204 ENGLISH LITERATURE AND THE BIBLE. (3) This course will examine the literary dimensions of the Bible including structure, style, and meaning as well as its status as Sacred Book. The influence of the Bible-as-metatext on the secular literature of the West will be the focus of the discussion.

ENGL 215 INTRODUCTION TO SHAKESPEARE. (3) A study of a selection of plays, in their intellectual and theatrical context with an emphasis on the interplay of text and performance.

● ★ **ENGL 225 AMERICAN LITERATURE 1.** (3)

★ **ENGL 226 AMERICAN LITERATURE 2.** (3) A study of the literary works of later American writers.

● **ENGL 227 AMERICAN LITERATURE 3.** (3)

★ **ENGL 228 CANADIAN LITERATURE 1.** (3) A chronological survey of Canadian literature, Part 1.

● ★ **ENGL 229 CANADIAN LITERATURE 2.** (3)

ENGL 230 INTRODUCTION TO THEATRE STUDIES. (3) (Fall) An introduction to dramatic literature, text analysis, textual and performance theory, and theatre history.

● **ENGL 237 INTRODUCTION TO STUDY OF A LITERARY FORM.** (3)

● **ENGL 238 COMEDY.** (3)

ENGL 269 INTRODUCTION TO PERFORMANCE. (3) (Winter) (Permission of instructor required.) The focus of this course is on the actor as communicator, and on those things (material, physical, and textual) which are inescapably central to the theatrical performance.

ENGL 275 INTRODUCTION TO CULTURAL STUDIES. (3) (Fall) (Required of all U1 Cultural Studies students) A survey of cultural studies, its history and subject matter, presenting key interpretive and analytic concepts, the aesthetic and political issues involved in the construction of sign systems, definitions of culture and cultural

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

values conceptualized both as a way of life and as a set of actual practices and products.

ENGL 276 METHODS OF CULTURAL ANALYSIS. (3) (Winter) (Prerequisite: ENGL 275) A study of basic methodologies found in cultural studies, such as forms of historicism, Marxism, psychoanalysis, philosophical materialism, feminism, gender theory. Topics such as aesthetics and film theory, authorship and spectatorship, modernism and postmodernism will be considered. Examples to be drawn from film, television, popular culture, and traditional literature.

★ **ENGL 279 INTRODUCTION TO FILM AS ART.** (3) An introduction to film aesthetics, with emphasis on narrative, style and genre throughout the history of cinema.

● ★ **ENGL 280 INTRODUCTION TO FILM AS MASS MEDIUM.** (3) (Students will be required to pay a screening fee.)

● **ENGL 297 SPECIAL TOPICS OF LITERARY STUDY.** (3)

ENGL 301 EARLIER 18TH CENTURY NOVEL. (3) Study of the English novel to c. 175.

● ★ **ENGL 302 RESTORATION AND 18TH C. ENGLISH LITERATURE 1.** (3)

★ **ENGL 303 RESTORATION AND 18TH C. ENGLISH LITERATURE 2.** (3) A study of the major writers of the later 18th century.

● **ENGL 304 LATER EIGHTEENTH CENTURY NOVEL.** (3)

ENGL 305 RENAISSANCE ENGLISH LITERATURE 1. (3) (Topic for 2003-04: Same-sex love in the Renaissance) A study of major non-dramatic works of the earlier Renaissance in England.

ENGL 307 RENAISSANCE ENGLISH LITERATURE 2. (3) A study of major non-dramatic works of the later Renaissance in England. Topic for 2003-04: The 1590s.

● **ENGL 308 ENGLISH RENAISSANCE DRAMA 1.** (3)

● **ENGL 309 ENGLISH RENAISSANCE DRAMA 2.** (3)

● **ENGL 310 RESTORATION AND 18TH CENTURY DRAMA.** (3)

ENGL 311 POETICS. (3) (Fall) (Limited to students in English Major Concentration, Literature Option. Requires departmental approval.) Discussion and application of basic critical tools for analysis of literature. Study of such features of poetry and prose fiction as prosody, diction, voice, tone, imagery, figurative language, point of view, narrative form, and character.

ENGL 314 20TH CENTURY DRAMA. (3) A study of selected representative works in modern drama and theatre.

ENGL 315 SHAKESPEARE. (3) A study of the major works of Shakespeare.

ENGL 316 MILTON. (3)

ENGL 317 THEORY OF ENGLISH STUDIES 1. (3) (Limited to students in English Major and Honours Programs) Philosophical approaches.

ENGL 318 THEORY OF ENGLISH STUDIES 2. (3) (Limited to students in English Major and Honours Programs) Socio-Historical approaches.

ENGL 319 THEORY OF ENGLISH STUDIES 3. (3) (Limited to students in English Major and Honours Programs) Approaches to textuality, authorship, and performance.

ENGL 320 POSTCOLONIAL LITERATURE. (3)

ENGL 321 CARIBBEAN FICTION. (3)

ENGL 324 20TH CENTURY AMERICAN PROSE. (3) Topic for 2003-04: American Noir Narrative.

ENGL 325 MODERN AMERICAN FICTION. (3) Topic for 2003-04: New York City and 20th Century American Fiction.

● **ENGL 326 19TH CENTURY AMERICAN PROSE.** (3)

● ★ **ENGL 327 CANADIAN PROSE FICTION 1.** (3)

★ **ENGL 328 DEVELOPMENT OF CANADIAN POETRY 1.** (3) A survey of Canadian poetry in English from the 18th century to the end of the Second World War.

ENGL 329 ENGLISH NOVEL: 19TH CENTURY 1. (3) A study of representative novelists of the earlier 19th century.

ENGL 330 ENGLISH NOVEL: 19TH CENTURY 2. (3) A study of representative novelists of the later 19th century.

★ **ENGL 331 LITERATURE ROMANTIC PERIOD 1.** (3) A study of the major figures of the first generation of romantic writers, focusing on Blake, Wordsworth and Coleridge.

★ **ENGL 332 LITERATURE ROMANTIC PERIOD 2.** (3) A study of the major figures of the second generation of romantic writers, focusing on Byron, Keats and Shelley.

★ **ENGL 333 DEVELOPMENT OF CANADIAN POETRY 2.** (3) A survey of Canadian poetry in English from the end of the Second World War to the present.

ENGL 334 VICTORIAN POETRY. (3) A study of the major Victorian poets.

ENGL 335 THE 20TH CENTURY NOVEL 1. (3) The Novel from the last years of the 19th century to World War II. Topic for 2003-04: Later 20th Century British Novel.

ENGL 336 THE 20TH CENTURY NOVEL 2. (3) Topic for 2003-04: Early 20th Century Modernist Prose.

★ **ENGL 339 CANADIAN PROSE FICTION 2.** (3) A survey of contemporary Canadian prose fiction in English, from modernism to post-modernism and beyond.

ENGL 340 HISTORY OF THE ENGLISH LANGUAGE. (3)

ENGL 342 INTRODUCTION TO OLD ENGLISH. (3) (Restriction: Not open to students who have taken ENGL 351.) An introduction to grammar and basic vocabulary in Old English.

ENGL 345 LITERATURE AND SOCIETY. (3) An examination of issues relating to literature and its social contexts, such as implications of gender, race, ethnicity. Topic for 2003-04: Postmodern Fiction.

● **ENGL 347 GREAT WRITINGS OF EUROPE 1.** (3)

ENGL 348 GREAT WRITINGS OF EUROPE 2. (3) (Topic for 2003-04: Western Epic and Mythology) A study of selected texts that significantly enhance understanding of English literature.

ENGL 349 ENGLISH LITERATURE AND FOLKLORE 1. (3) A study of representative texts from Beowulf to the late Renaissance period in relation to their background in folk tradition. A focus on the origin and development of folklore motifs.

● **ENGL 352 CURRENT TOPICS IN CRITICISM AND CRITICAL THEORY.** (3) (Priority will be given to English Major/Honours students in second year of program)

● **ENGL 353 INTERDISCIPLINARY APPROACHES TO LITERARY RESEARCH.** (3) (Priority will be given to English Major/Honours students in second year of program)

ENGL 355 THE POETICS OF PERFORMANCE. (3) (Fall) (Limited to students in the English Major Concentration, Drama and Theatre Option) This course, normally taken in tandem with ENGL 230, examines and tests theories of acting, directing, and design through scene work and practical exercises.

● **ENGL 356 MIDDLE ENGLISH.** (3)

★ **ENGL 357 CHAUCER - CANTERBURY TALES.** (3)

● ★ **ENGL 358 CHAUCER - TROILUS AND CRISEYDE.** (3)

ENGL 359 THE POETICS OF THE IMAGE. (3) (Fall) (Limited to students in the English Major Concentration, Cultural Studies Option) This course, normally taken in tandem with ENGL 275, examines contemporary debates about the aesthetic dimensions as well as social roles of pictorial, theatrical, cinematic, and other representations, the meanings, effects, and aesthetic significance of which depend on their having visually recognizable features.

ENGL 360 LITERARY CRITICISM. (3) (Prerequisite: at least 3 credits of ENGL 200, ENGL 201, ENGL 202, ENGL 203. Pre-/Co-requisite: ENGL 311. Required for but not restricted to Literature Honours students) Principles of literary criticism.

ENGL 361 POETRY OF THE 20TH CENTURY 1. (3) A critical survey of major British and North American poetry, c. 1890 - 1940. Topic for 2003-04: Whitman and Survey of Earlier 20th C.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ENGL 362 POETRY OF THE 20TH CENTURY 2. (3) (Prerequisite: ENGL 311) A critical survey of contemporary British and North American poetry, c. 1930 - 1980. Topic for 2003-04: Women in Modern Poetry.

● **ENGL 364 CREATIVE WRITING-FICTION 2.** (3) (Permission of instructor required.)

ENGL 365 COSTUMING FOR THE THEATRE 1. (3) (Permission of instructor required.) (Not open to students enrolled in ENGL 368) Introduction to costume-making for the theatre, covering fabrics, textiles and costume decoration.

ENGL 367 ACTING 2. (3) (Prerequisite: ENGL 269 and permission of instructor.) (Not open to students who have taken 110-469D) The actor as analyzer of scripts and characters; textual analysis, practice in character development through improvisations, mask work and physical training.

ENGL 368 STAGE SCENERY AND LIGHTING 1. (3) (Permission of instructor required) (Not open to students enrolled in ENGL 365) An introduction to the technical aspects of stage settings and theatrical lighting.

● **ENGL 370 HISTORY OF THE THEATRE 1.** (3)

ENGL 371 HISTORY OF THE THEATRE 2. (3) An overview of dramatic forms and theatrical practice from the 18th century through the development of 19th century realistic traditions, to 20th century reactions against realism.

● **ENGL 372 STAGE SCENERY AND LIGHTING 2.** (3)

● **ENGL 375 INTERPRETATION DRAMATIC TEXT.** (3) (Prerequisites: ENGL 230 and ENGL 269 or permission of the instructor)

ENGL 377 COSTUMING FOR THE THEATRE 2. (3) (Prerequisite: permission of instructor.) (Not open to students enrolled in ENGL 372) Advanced topics in costume-making for the theatre, including millinery, dyeing, costume breakdown, and silk painting techniques.

● **ENGL 378 MEDIA AND CULTURE.** (3) (Prerequisite: ENGL 275)

ENGL 379 TOPICS IN FILM STUDIES. (3) (In 2003-04: Classic Comic Cinema)

ENGL 381 STUDIES HISTORY FILM: MAJOR DIRECTOR. (3) (Limited to students in English Major programs)

● **ENGL 382 STUDIES HISTORY FILM: PERIOD OR NATIONAL CINEMA.** (3)

ENGL 383 STUDIES IN COMMUNICATIONS 1. (3) (Permission of instructor required) Studies in the relationships between the media and culture.

● **ENGL 384 STUDIES IN COMMUNICATION 2.** (3) (Permission of instructor required)

ENGL 385 TOPICS IN LITERATURE AND FILM. (3) (Topic for 2003-04: Shakespeare on Film)

● **ENGL 386 STUDIES IN MASS MEDIA 1.** (3)

● **ENGL 388 STUDIES IN POPULAR CULTURE 1.** (3)

● **ENGL 389 STUDIES IN POPULAR CULTURE 2.** (3)

ENGL 391 SPECIAL TOPICS: CULTURAL STUDIES 1. (3) Current issues in cultural studies. Topics will include contemporary debates on high culture and the literary canon, and the question of aesthetic value and aesthetic judgement.

ENGL 392 SPECIAL TOPICS: CULTURAL STUDIES 2. (3) Current issues in cultural studies. Topics may include gender and sexuality; modernism and post-modernism; new social movements; social action. Topic for 2003-04: Culture of Life, Culture of Death.

● **ENGL 393 CANADIAN CINEMA 1.** (3)

● **ENGL 395 CULTURAL STUDIES AND THE ARTS.** (3) (Prerequisite: ENGL 275)

ENGL 400 EARLIER ENGLISH RENAISSANCE. (3)

ENGL 401 STUDIES IN THE 17TH CENTURY. (3) Topic for 2003-04: Metaphysical Poets.

ENGL 403 STUDIES IN THE 18TH CENTURY. (3)

ENGL 404 STUDIES IN 19TH CENTURY LITERATURE 1. (3)

ENGL 405 STUDIES IN 19TH CENTURY LITERATURE 2. (3) Topic for 2003-04: Charles Dickens.

ENGL 407 THE 20TH CENTURY. (3)

ENGL 408 THE 20TH CENTURY. (3) Topic for 2003-04: Ernest Hemingway.

● **ENGL 409 STUDIES IN A CANADIAN AUTHOR.** (3) (Prerequisite: previous work in Canadian Literature)

ENGL 410 THEME OR MOVEMENT CANADIAN LITERATURE. (3) (Prerequisite: previous work in Canadian Literature) (Topic for 2003-04: Literary Montreal) Advanced study of a significant theme or movement in Canadian Literature.

● **ENGL 411 STUDIES IN CANADIAN FICTION.** (3) (Prerequisite: Permission of instructor, based on previous work in Canadian fiction)

ENGL 414 STUDIES IN 20TH CENTURY LITERATURE 1. (3) Topic for 2003-04: Tales of the Jazz Age: American Prose in the 1920s.

ENGL 415 STUDIES IN 20TH CENTURY LITERATURE 2. (3) Topic for 2003-04: Spy Fiction.

ENGL 416 STUDIES IN SHAKESPEARE. (3) (Topic for 2003-04: Shakespeare's Major Tragedies)

ENGL 418 A MAJOR MODERNIST WRITER. (3) Intensive study of a writer important for Modernism, such as James Joyce, T.S. Eliot, Ezra Pound, Gertrude Stein. Topic for 2003-04: T.S. Eliot.

ENGL 419 STUDIES IN 20TH CENTURY LITERATURE. (3)

ENGL 422 STUDIES IN 19TH CENTURY AMERICAN LITERATURE. (3) Topic for 2003-04: Whitman, Dickinson, Emerson.

ENGL 423 STUDIES IN 19TH CENTURY LITERATURE. (3)

ENGL 424 IRISH LITERATURE. (3) Topic for 2003-04: James Joyce.

● **ENGL 430 STUDIES IN DRAMA.** (3)

ENGL 431 STUDIES IN DRAMA. (3) Topic for 2003-04: Bertolt Brecht: Theory, Drama, Prose, Poetry.

ENGL 434 INDEPENDENT THEATRE PROJECT. (3) (This course will allow students to undertake special projects, frequently involving background readings, performances, and essays. This course is normally open only to Major or Honours students in the Department. Permission must be obtained from the Department before registration)

ENGL 437 STUDIES IN LITERARY FORM. (3) (Topic for 2003-04: Medieval and Renaissance Voyage Literature)

ENGL 438 STUDIES IN LITERARY FORM. (3) Study of a specific literary form. Topic for 2003-04: Women in Detective Fiction.

ENGL 443 CONTEMPORARY WOMEN'S FICTION. (3) Study of a theme or author in contemporary women's fiction.

ENGL 447 CROSSCURRENTS/ENGLISH LITERATURE AND EUROPEAN LITERATURE 1. (3) (Topic for 2003-04: Shakespeare and Chekhov)

ENGL 449 STUDIES IN THE GOTHIC. (3) Study of aspects of the Gothic in a variety of periods and media.

● **ENGL 452 STUDIES IN OLD ENGLISH.** (3) (Prerequisite: ENGL 351 or equivalent, or permission of the instructor)

● **ENGL 458 THEORIES OF TEXT AND PERFORMANCE 1.** (3) (Prerequisites: ENGL 230 and ENGL 269 or permission of instructor)

ENGL 459 THEORIES OF TEXT AND PERFORMANCE 2. (3) (Prerequisites: ENGL 230 and ENGL 269 or permission of instructor) This course provides an historical perspective on advanced theoretical problems affecting both dramatic texts and theatrical performance starting from the 19th Century to the present. The historical periods covered in this course may vary from year to year.

ENGL 464 CREATIVE WRITING: POETRY. (3) (Prerequisite: permission of instructor.)

● **ENGL 466D1 DIRECTING FOR THE THEATRE.** (3) (Prerequisites: ENGL 230, ENGL 269 and permission of instructor. Password required) (Students must also register for ENGL 466D2)

● **ENGL 466D2 DIRECTING FOR THE THEATRE.** (3) (Prerequisite: ENGL 466D1)

● **ENGL 467 HISTORY OF THE THEATRE 3.** (3)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

- **ENGL 469 ACTING 3.** (3) (Prerequisite: ENGL 269 and permission of instructor.) (Not open to students who have taken 110-469D.)
- **ENGL 473 ADVANCED PRACTICAL WORK THEATRE 1.** (3) (Permission of instructor required)
- **ENGL 474 ADVANCED PRACTICAL WORK THEATRE 2.** (3)
- **ENGL 475 STUDIES: HISTORY OF COMMUNICATION 1.** (3)
- **ENGL 476 ALTERNATIVE APPROACHES TO MEDIA 1.** (3) (Workshop course. Departmental permission required)
- ENGL 480 STUDIES IN HISTORY OF FILM 1.** (3)
- **ENGL 481 STUDIES IN HISTORY OF FILM 2.** (3) (Permission of instructor required)
- **ENGL 484 SEMINAR IN THE FILM.** (3) (Permission of instructor required)
- ENGL 485 HISTORY OF THE THEATRE 5.** (3) A study of history of the theatre during the 19th century. Topic for 2003-04: Melodrama.
- ENGL 486 HISTORY OF THE THEATRE 6.** (3) A study of history of the theatre during the Twentieth century. Topic for 2003-04: 20th Century Canadian Theatre.
- **ENGL 487 SPECIAL TOPICS / COMMUNICATIONS AND MASS MEDIA 1.** (3)
- ENGL 488 SPECIAL TOPICS / COMMUNICATIONS AND MASS MEDIA 2.** (3) (Prerequisite: permission of the instructor. Limited to students in English Major programs. Password required) An advanced seminar in varying themes in communications for students in their final year of the Cultural Studies program.
- ENGL 489 CONTEMPORARY CULTURE AND CRITICAL THEORY 1.** (3) Intensive study of advanced theoretical topics in the study of contemporary culture. Topics will vary from year to year depending on staff interests.
- ENGL 490 CONTEMPORARY CULTURE AND CRITICAL THEORY 2.** (3) Intensive study of advanced theoretical topics in the study of contemporary culture. Topics will vary from year to year depending on staff interests. Topic for 2003-04: The Body in Cultural Studies.
- ENGL 491D1 HONOURS ESSAY.** (3) (Students must also register for ENGL 491D2) (No credit will be given for this course unless both ENGL 491D1 and ENGL 491D2 are successfully completed in consecutive terms) (ENGL 491D1 and ENGL 491D2 together are equivalent to ENGL 491)
- ENGL 491D2 HONOURS ESSAY.** (3) (Prerequisite: ENGL 491D1) (No credit will be given for this course unless both ENGL 491D1 and ENGL 491D2 are successfully completed in consecutive terms) (ENGL 491D1 and ENGL 491D2 together are equivalent to ENGL 491) See ENGL 491D1 for course description.
- May also be available as: ENGL 491N1 and ENGL 491N2**
- **ENGL 492 IMAGE AND TEXT 1.** (3)
- ENGL 493 IMAGE AND TEXT 2.** (3) Study of the relationship between verbal and visual aspects of a range of cultural artifacts with particular emphasis on juxtapositions of image and text in contemporary media.
- ENGL 495 INDIVIDUAL READING COURSE.** (3) (Intended for advanced and/or specialized work based on an extensive background in departmental studies. This course is normally not available to students who are not Majors or Honours students in the Department) By arrangement with individual instructor. Permission must be obtained from the Department before registration.
- ENGL 496 INDIVIDUAL READING COURSE.** (3) (Intended for advanced and/or specialized work based on an extensive background in departmental studies. This course is normally not available to students who are not Majors or Honours students in the Department) By arrangement with individual instructor. Permission must be obtained from the Department before registration.
- **ENGL 497 SEMINAR IN CULTURAL STUDIES.** (3)
- ENGL 499 DEPARTMENTAL SEMINAR.** (3) (Permission of instructor required) Topic for 2003-04: Practising Theatre Criticism.

- ENGL 500 MIDDLE ENGLISH.** (3) Topic for 2003-04: Women and Body in the Middle Ages.
- **ENGL 501 16TH CENTURY.** (3)
- ENGL 503 18TH CENTURY.** (3)
- ENGL 504 19TH CENTURY.** (3) Topic for 2003-04: Critical Approaches to Romantic Poetry.
- ENGL 505 20TH CENTURY.** (3) Topic for 2003-04: Narrative and Seduction.
- ENGL 516 SHAKESPEARE.** (3) Topic for 2003-04: Shakespearience.
- ENGL 525 AMERICAN LITERATURE.** (3)
- ENGL 527 CANADIAN LITERATURE.** (3) Topic for 2003-04: Ondaatje.
- ENGL 529D1 INTERDISCIPLINARY SEMINAR - NORTH AMERICAN STUDIES.** (1.5) (Students must also register for ENGL 529D2) (No credit will be given for this course unless both ENGL 529D1 and ENGL 529D2 are successfully completed in consecutive terms) (ENGL 529D1 and ENGL 529D2 together are equivalent to ENGL 529)
- ENGL 529D2 INTERDISCIPLINARY SEMINAR - NORTH AMERICAN STUDIES.** (1.5) (Prerequisite: ENGL 529D1) (No credit will be given for this course unless both ENGL 529D1 and ENGL 529D2 are successfully completed in consecutive terms) (ENGL 529D1 and ENGL 529D2 together are equivalent to ENGL 529) See ENGL 529D1 for course description.
- **ENGL 530 LITERARY FORMS.** (3)
- **ENGL 531 LITERARY FORMS.** (3)
- ENGL 533 LITERARY MOVEMENTS.** (3) Topic for 2003-04: Postcolonial Fiction.
- ENGL 540 LITERARY THEORY 1.** (3) (Topic for 2003-04: Feminist Textuality)
- **ENGL 545 TOPICS IN LITERATURE & SOCIETY.** (3)
- **ENGL 553 OLD ENGLISH LITERATURE.** (3) (Prerequisite: ENGL 351)
- **ENGL 565 MEDIEVAL DRAMA WORKSHOP.** (3)
- ENGL 566 SPECIAL STUDIES IN DRAMA 1.** (3)
- **ENGL 568 TOPICS IN THE DRAMATIC FORM.** (3)
- **ENGL 569 THEORIES OF REPRESENTATION.** (3) (Prerequisites: ENGL 458, ENGL 459 and/or permission of instructor)
- ENGL 585 MODES OF COMMUNICATION 1.** (3)
- **ENGL 586 MODES OF COMMUNICATION 2.** (3)
- **ENGL 587 THEORETICAL ISSUES: STUDY COMMUNICATIONS AND CULTURE.** (3)

ESLN – English Second Language

Offered by: English and French Language Centre
Former Teaching Unit Code: 128

All ESLN courses require placement tests and departmental permission. Registration is on a first come, first serve basis.

- **ESLN 150 ENGLISH AS A SECOND LANGUAGE.** (6) (Summer)
- ESLN 200 ESL: INTERMEDIATE 1.** (3) (3 hours) (Prerequisite: Placement test) Open to students who have already established a basic knowledge of English. Students develop oral skills (pronunciation and communication), writing skills (vocabulary building, grammar review, writing techniques, editing techniques), reading strategies and critical thinking skills. Oral presentations. Extensive feedback including audio-taped commentary on writing assignments.
- ESLN 201 ESL: INTERMEDIATE 2.** (3) (Winter) (3 hours) (Prerequisite: ESLN 200 or placement test) A continuation of course ESLN 200. Further development of oral skills (pronunciation and communication), writing skills (vocabulary building, grammar review, writ-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ing techniques, editing techniques), reading strategies and critical thinking skills. Oral presentations. Extensive feedback, including audio-taped commentary on writing assignments.

● **ESLN 299 ESL: ACADEMIC ENGLISH SEMINAR.** (3) (3 hours) (Restriction: Open only to students whose first language is not English entering the university. U1 students.) (Ce cours s'adresse aux étudiants dont la langue maternelle n'est pas l'anglais et qui sont admis à un programme de 1er cycle à McGill à l'automne.)

ESLN 300 ESL: HIGH INTERMEDIATE 1. (3) (3 hours) (Prerequisite: ESLN 201 or placement test) Open to students who have established a good knowledge of English. Students develop their writing (vocabulary building, grammar review, writing techniques, editing), critical thinking, and reading skills. Fundamentals of oral presentation. The basics of academic writing are emphasized. Multiple drafts of short coherent papers. Extensive feedback, including audio-taped commentary.

ESLN 301 ESL: HIGH INTERMEDIATE 2. (3) (Winter) (3 hours) (Prerequisite: ESLN 300 or placement test) A continuation of ESLN 300. Students with a good knowledge of English further develop their writing (vocabulary building, grammar review, writing techniques, editing), critical thinking, and reading skills. Fundamentals of oral presentation. The basics of academic writing are emphasized. Multiple drafts of short coherent papers. Extensive feedback, including audio-taped commentary.

ESLN 400 ESL: ADVANCED 1. (3) (3 hours) (Prerequisite: ESLN 301 or placement test) This advanced English course promotes effective, accurate, academic English. Critical thinking, editing skills, reading strategies, and oral presentation are emphasized. Writing assignments focus on the writing process, text and sentence structure, vocabulary, punctuation, and content. Reading assignments provide rhetorical models and expand vocabulary. Extensive feedback, including audio-taped commentary.

ESLN 401 ESL: ADVANCED 2. (3) (Winter) (3 hours) (Prerequisite: ESLN 400 or placement test) This continuation of ESLN 400 further promotes effective, accurate, academic English. Critical thinking, editing skills, reading strategies, and oral presentation are emphasized. Writing assignments focus on the writing process, text and sentence structure, vocabulary, punctuation, and content. Reading assignments provide rhetorical models and expand vocabulary. Extensive feedback, including audio-taped commentary.

ESLN 500 ESL: FUNDAMENTALS OF ACADEMIC WRITING. (3) (Placement test and restrictions: see above) (Not open to students who have taken EFRL 250) Academic writing as a genre of writing: audience, purpose, organization, style. Critical thinking, reading, and writing skills. In-class textual analysis, summary, and critique exercises. Writing mechanics and editing. Library research techniques. Research paper. Diagnosis and correction of ESL problems. Multiple drafts. Extensive individual feedback including audio-taped commentary.

ESLN 550 PRONUNCIATION AND COMMUNICATION. (3) (3 hours) (Prerequisite: placement test) (Restriction: open only to graduate students for whom English is a second language) (This course cannot be counted towards course requirements of any graduate program) This course focuses on the following areas: (a) the pronunciation of English, (b) the pragmatic and socio-linguistic aspects of English, (c) cross-cultural orientation: non-verbal communication; appropriate behaviours for instructors and students in the Canadian classroom setting.

ESLN 590 WRITING FOR GRADUATE STUDENTS. (3) (3 hours) (Prerequisite: placement test) (Restriction: open only to graduate students for whom English is a second language) Audience, purpose, organization and style of graduate-level academic writing. Mechanics. Editing. Textual analysis. Critical thinking. Genres: problem-solution, general-specific, process description, data commentary, article summary/critique. Student work-in-progress. ESL diagnosis-correction. Multiple drafts. Extensive feedback including audio-taped commentary and individual conferences.

FREN – French (Arts)

Cours offerts au : Département de langue et littérature françaises
Ancien préfixe du département: 125

FREN 199 FYS: LITTÉRATURE FRANÇAISE. (3) (Ouvert aux seuls nouveaux étudiants de U0 ou de U1, qui ne peuvent s'inscrire qu'à un seul séminaire de première année (FYS). Les étudiants qui s'inscriraient à plus d'un de ces séminaires devront se retirer pour n'en conserver qu'un seul.) (Maximum de 25 étudiants) Le cours a pour but d'initier l'étudiant à la recherche dans le domaine de la littérature française par l'étude des grands mouvements littéraires et des principaux auteurs. L'étudiant devra se familiariser avec les outils de recherche en travaillant sur un domaine de recherche bien précis.

FREN 201 COMPOSITION 1. (3) (Fall) (Préalable: test. Effectifs contingentés. Autorisation départementale requise.) (Les étudiants qui ont suivi le cours 125-200 ou 125-202 ne seront pas admis) Révision grammaticale et enrichissement des moyens d'expression par la composition et l'étude de textes littéraires.

FREN 203 COMPOSITION 2. (3) (Winter) (Préalable: FREN 201 ou test. Effectifs contingentés. Autorisation départementale requise) (Les étudiants qui ont suivi le cours 125-204 ne seront pas admis) Enrichissement de la langue, délimitation des faits d'expression; étude systématique des ressources expressives du français. Rédactions.

● ★ **FREN 210 FRANCOPHONIE 1.** (3)

● **FREN 221 CIVILISATION FRANÇAISE 1.** (3)

● **FREN 228 CIVILISATION QUÉBÉCOISE 1.** (3)

FREN 231 LINGUISTIQUE FRANÇAISE. (3) Bref historique de la linguistique française de F. de Saussure à nos jours. Description linguistique du français moderne (éléments de phonologie, de phonétique normative, de lexicologie, de sémantique évolutive et synchronique, de syntaxe et de morphologie).

FREN 239 STYLISTIQUE COMPARÉE. (3) (Préalable: test. Pas de préalable pour la section 002 réservée aux étudiants de la Faculté d'éducation. Autorisation départementale requise. Effectifs contingentés. Priorité donnée aux étudiants inscrits dans les programmes de traduction) (Les étudiants qui ont suivi le cours 125-238 ne seront pas admis) Initiation aux principes de la traduction par une étude systématique des contrastes entre les structures linguistiques de l'anglais et du français. Une bonne connaissance des deux langues est nécessaire au départ.

FREN 244 TRADUCTION 1. (3) (Fall) (Préalable: FREN 239 ou test de classement. Autorisation départementale requise. Effectifs contingentés) (Les étudiants qui ont suivi le cours 125-345 ne seront pas admis) Exercices portant sur les éléments syntaxiques et lexicaux qui présentent des problèmes de traduction simples mais fréquents. Traduction de textes variés.

FREN 245 GRAMMAIRE AVANCÉE. (3) (Fall) (Préalable: test. Autorisation départementale requise) Cours entièrement consacré à la révision systématique des principales difficultés de la langue française.

FREN 247 DISSERTATION. (3) (Winter) (Préalable: test et FREN 245. Autorisation départementale requise) (Réservé aux étudiants du Département) Cours consacré à l'apprentissage des genres universitaires; dissertation, compte rendu, résumé etc.

FREN 250 LITTÉRATURE FRANÇAISE AVANT 1800. (3) (Fall) (Aucun préalable ni cours conjoint pour les étudiants hors-Département. Cours conjoints: Option Lettres: FREN 352, FREN 395; Option Lettres et traduction: FREN 352) Introduction à la littérature française des origines à la fin du XVIII^e siècle.

FREN 251 LITTÉRATURE FRANÇAISE DEPUIS 1800. (3) (Winter) (Aucun préalable ni cours conjoint pour les étudiants hors-Département. Préalables: Option Lettres: FREN 250, FREN 352, FREN 395; Option Lettres et traduction: FREN 250, FREN 352. Cours conjoints: Option Lettres: FREN 353, FREN 396; Option Lettres et

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

traduction: FREN 353) Introduction à la littérature française des XIXe et XXe siècles.

FREN 252 LITTÉRATURE QUÉBÉCOISE. (3) (Fall) (Aucun préalable ni cours conjoint pour les étudiants hors-Département. Préalables: Option Lettres: FREN 251, FREN 353, FREN 396; Option Lettres et traduction: FREN 251, FREN 353. Cours conjoints: Option Lettres: FREN 374, FREN 397; Option Lettres et traduction: FREN 374) (Les étudiants qui ont suivi le cours FREN 380 ne seront pas admis) Introduction à la littérature québécoise des origines à nos jours.

- ★ **FREN 310 HISTOIRE DU CINÉMA FRANÇAIS 1.** (3)
- ★ **FREN 311 HISTOIRE DU CINÉMA FRANÇAIS 2.** (3)
- ★ **FREN 312 FRANCOPHONIE 2.** (3) (Les étudiants qui ont suivi le cours 125-368 ne seront pas admis)
- ★ **FREN 313 FRANCOPHONIE 3.** (3)

FREN 315 LE CINÉMA QUÉBÉCOIS. (3) Étude thématique du cinéma québécois à travers ses principaux films. Les approches seront: poétique, sociologique, psychologique et politique.

- **FREN 321 CIVILISATION FRANÇAISE 2.** (3)

FREN 324 CIVILISATION FRANÇAISE 5: LA FRANCE D'AUJOURD'HUI. (3) (Préalable: FREN 221 ou permission du professeur) (Les étudiants qui ont suivi le 125-220 ne seront pas admis) Histoire politique, sociale, culturelle et économique de la France depuis 1940.

FREN 329 CIVILISATION QUÉBÉCOISE 2. (3) (Les étudiants qui ont suivi le cours 125-229 ne seront pas admis) Étude de différents aspects de la société québécoise (économique, politique, social, culturel) de 1877 à aujourd'hui.

FREN 334 MÉTHODES D'ANALYSE DES TEXTES LITTÉRAIRES 1. (3) Ce cours aborde systématiquement les méthodes, notions et modèles théoriques susceptibles de s'appliquer à l'analyse descriptive des textes littéraires de genres et époques divers.

- **FREN 335 MÉTHODES D'ANALYSE DES TEXTES LITTÉRAIRES 2.** (3)

FREN 336 LA LANGUE FRANÇAISE. (3) (Les étudiants qui ont suivi les cours 125-236 ou 125-237 ne seront pas admis) Histoire de la langue française, du bas-latin à la langue moderne. Étude de l'évolution phonétique, syntaxique, sémantique. Étude de textes des différentes époques.

FREN 346 TRADUCTION 2. (3) (Winter) (Préalable: FREN 244, 125-345 ou test. Autorisation départementale requise. Effectifs contingentés) Stylistique comparée du français et de l'anglais; étude de procédés de traduction. Traduction de textes courts.

FREN 347 TERMINOLOGIE GÉNÉRALE. (3) (Préalable: 6 crédits en traduction) Étude empirique des différents stades dans le travail du terminologue: collection de données, production de fiches terminologiques, recherches ponctuelles et thématiques. Les problèmes terminologiques de la traduction. Étude de problèmes pratiques posés par la terminologie bilingue ou multilingue et ses répercussions dans un domaine particulier des connaissances humaines.

FREN 349 TRADUCTION 3. (3) (Fall) (Préalable: FREN 346 ou test. Effectifs contingentés. Autorisation départementale requise) (Les étudiants qui ont suivi le cours 125-445 ou 125-446 ne seront pas admis) Cours essentiellement pratique qui a pour but d'étudier les problèmes que pose la traduction dans des domaines divers.

- **FREN 350 LITTÉRATURE FRANÇAISE DU 20E SIÈCLE 1.** (3)
- **FREN 351 LITTÉRATURE FRANÇAISE DU 20E SIÈCLE 2.** (3)

FREN 352 LECTURES 1. (3) (Fall) (Cours réservé aux étudiants du Département. Cours conjoints: Option Lettres: FREN 250, FREN 395; Option Lettres et traduction: FREN 250) Littérature française des origines au XVIIIe siècle: lecture d'un choix de textes (30) d'après une liste proposée par le Département.

FREN 353 LECTURES 2. (3) (Winter) (Cours réservé aux étudiants du Département. Préalables: Option Lettres: FREN 250, FREN 352, FREN 395; Option Lettres et traduction: FREN 250, FREN 352. Cours conjoints: Option Lettres: FREN 251, FREN 396; Option Lettres et traduction: FREN 251) Littérature française des XIXe et XXe siècles: lecture d'un choix de textes (30) d'après une liste proposée par le Département.

FREN 355 LE ROMAN DE PROUST À CAMUS. (3) Le roman en France depuis le début du XXe siècle jusqu'à la deuxième Guerre Mondiale.

FREN 360 LE ROMANTISME 1: THÉÂTRE ET POÉSIE. (3) Étude de la poésie et du drame romantiques à travers les écrits théoriques et les oeuvres majeures. Dans un contexte historique et social, étude du développement d'une sensibilité et d'une thématique nouvelles en poésie.

- **FREN 362 LA LITTÉRATURE DU 17E SIÈCLE 1.** (3)
- **FREN 364 LA LITTÉRATURE DU 18E SIÈCLE 1.** (3)
- **FREN 366 LITTÉRATURE DE LA RENAISSANCE 1.** (3)

FREN 372 LE ROMAN QUÉBÉCOIS 1. (3) Étude du roman québécois des origines à 1940.

FREN 374 LECTURES 3. (3) (Fall) (Cours réservé aux étudiants du Département. Préalables: Option Lettres: FREN 251, FREN 353, FREN 396; Option Lettres et traduction: FREN 251, FREN 353. Cours conjoints: Option Lettres: FREN 252, FREN 397; Option Lettres et traduction: FREN 252) Littérature québécoise des origines à nos jours: lecture d'un choix de textes (30) d'après une liste proposée par le Département.

- **FREN 375 THÉÂTRE QUÉBÉCOIS.** (3) (Les étudiants qui ont suivi le cours 125-570 ne seront pas admis)

- **FREN 382 LE ROMAN QUÉBÉCOIS 2.** (3)

- **FREN 384 LE RÉCIT BREF.** (3)

- **FREN 394 THÉORIE DE LA TRADUCTION.** (3)

FREN 395 TRAVAUX PRATIQUES 1. (3) (Fall) (Cours réservé aux étudiants du Département de l'Option Lettres. Cours conjoints: FREN 250, FREN 352) Étude détaillée de textes appartenant à la littérature française des origines à la fin du XVIIIe siècle.

FREN 396 TRAVAUX PRATIQUES 2. (3) (Winter) (Préalables: FREN 250, FREN 352, FREN 395. Cours conjoints: FREN 251, FREN 353) Cours réservé aux étudiants du Département de l'Option Lettres.) Étude détaillée de textes appartenant à la littérature française des XIXe et XXe siècles.

FREN 397 TRAVAUX PRATIQUES 3. (3) (Fall) (Préalables: FREN 251, FREN 353, FREN 396. Cours conjoints: FREN 374, FREN 252) (Cours réservé aux étudiants du Département de l'Option Lettres) Étude détaillée de textes appartenant à la littérature québécoise des origines à nos jours.

- **FREN 422 CIVILISATION FRANÇAISE 3.** (3) (Préalable: FREN 321 ou permission du professeur)

FREN 431 TRADUCTION 4. (3) (Winter) (Cours réservé aux étudiants de l'Option Lettres et traduction. Préalable: FREN 349 ou test. Autorisation départementale requise) (Les étudiants qui ont suivi le cours 125-446 ne seront pas admis) Suite du cours FREN 349. Révision de textes; principes et pratiques de la révision unilingue et bilingue: critères, méthode, mode de notation. Initiation au contrôle de la qualité. Code typographique et correction d'épreuves. La profession de réviseur. Travaux pratiques.

- **FREN 433 SÉMANTIQUE ET LEXICOLOGIE.** (3) (Préalable: FREN 231 ou permission du professeur) (Les étudiants qui ont suivi le cours 125-333 ne seront pas admis)

FREN 434 SOCIOLINGUISTIQUE DU FRANÇAIS. (3) (Les étudiants qui ont suivi le cours 125-333 ne seront pas admis) Éléments de sociolinguistique et leur application aux pays francophones. Rapports entre les aspects phonologiques, grammaticaux et lexicologiques du parler et le milieu social. Langues en contact, planification linguistique.

FREN 440 ATELIER DE CRÉATION LITTÉRAIRE. (3) (Préalable: FREN 247. Effectifs contingentés) Le but de cet atelier est de permettre à l'étudiant d'avoir une meilleure compréhension du processus de création littéraire et de faire en sorte que son écriture obéisse à des exigences formelles de plus en plus rigoureuses.

FREN 441 THÈME ANGLAIS. (3) (Préalable: FREN 244, 125-345 ou permission du professeur. Autorisation départementale requise. Effectifs contingentés) Traduction de textes généraux du français vers l'anglais.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

● **FREN 443 VERSION LITTÉRAIRE.** (3) (Préalable: FREN 431, 125-446 ou permission du professeur. Les étudiants qui ont suivi le cours 125-510 ne seront pas admis)

FREN 453 POÉSIE DU 20^E SIÈCLE. (3) Les principaux courants de la poésie en France depuis Apollinaire.

● **FREN 454 LE THÉÂTRE AU 20^E SIÈCLE.** (3)

FREN 455 LA LITTÉRATURE MÉDIÉVALE 1. (3) Initiation au système de la langue médiévale ainsi qu'à la production en langue française des origines au XIII^e siècle. Survol des différents genres littéraires (littérature épique et hagiographique, conte courtois, roman, fabliaux, théâtre) et de textes significatifs.

● **FREN 456 LA LITTÉRATURE MÉDIÉVALE 2.** (3)

● **FREN 457 LA LITTÉRATURE DE LA RENAISSANCE 2.** (3) (Les étudiants qui ont suivi le cours 125-367 ne seront pas admis)

● **FREN 458 LA LITTÉRATURE DU 17^E SIÈCLE 2.** (3) (Les étudiants qui ont suivi le cours 125-363 ne seront pas admis)

FREN 459 LA LITTÉRATURE DU 18^E SIÈCLE 2. (3) (Les étudiants qui ont suivi le cours 125-365 ne seront pas admis) Étude des courants d'idées et du développement de la sensibilité en France après 1750.

FREN 461 QUESTIONS DE LITTÉRATURE 1. (3) (Cours réservé aux étudiants en Spécialisation du Département. Préalables: Options Lettres: FREN 490, FREN 493, FREN 497; Option Lettres et traduction: FREN 490, FREN 493) Cours à contenu variable: un thème (auteur, genre, période, question, etc.) de littérature ou de civilisation française ou francophone.

FREN 464D1 MÉMOIRE DE SPÉCIALISATION. (3) (Fall) (Cours réservé aux étudiants en Spécialisation du Département. Autorisation départementale requise. Préalables: Options Lettres: FREN 490, FREN 493, FREN 497; Option Lettres et traduction: FREN 490, FREN 493) (Les étudiants doivent s'inscrire au cours FREN 464D2) (Aucun crédit ne sera accordé pour ce cours à moins de réussir les deux cours FREN 464D1 et FREN 464D2 suivis en séquence) Travail sur un sujet spécialisé de critique littéraire, de théorie, de traduction ou de création.

FREN 464D2 MÉMOIRE DE SPÉCIALISATION. (3) (Winter) (Préalable: FREN 464D1) (Aucun crédit ne sera accordé pour ce cours à moins de réussir les deux cours FREN 464D1 et FREN 464D2 suivis en séquence) Voir FREN 464D1 pour la description.

FREN 470 POÉSIE QUÉBÉCOISE. (3) Évolution de la poésie et des idées poétiques au Québec du XIX^e siècle à nos jours: l'École de Québec, l'École de Montréal, la querelle de «l'exotisme», les courants modernistes, la «poésie du pays», la «nouvelle écriture». Étude de quelques textes marquants.

FREN 472 QUESTIONS DE LITTÉRATURE 2. (3) (Cours réservé aux étudiants en Spécialisation du Département. Préalables: Options Lettres: FREN 490, FREN 493, FREN 497; Option Lettres et traduction: FREN 490, FREN 493) Cours à contenu variable: un thème (auteur, genre, période, question, etc.) de littérature ou de civilisation québécoise.

● **FREN 480 ROMAN QUÉBÉCOIS 3.** (3) (Les étudiants qui ont suivi le cours 125-383 ne seront pas admis)

● **FREN 481 LITTÉRATURE ET ANTIQUITÉ.** (3)

FREN 482 LE ROMANTISME 2. (3) (Les étudiants qui ont suivi le cours 125-361 ne seront pas admis) Illustration à l'aide d'œuvres caractéristiques choisies chez les auteurs majeurs, des différentes tendances qui se manifestent dans le genre romanesque à l'époque romantique.

● **FREN 483 LE ROMAN DEPUIS SARTRE.** (3) (Les étudiants qui ont suivi le cours 125-358 ne seront pas admis)

● **FREN 484 RÉALISME ET NATURALISME.** (3) (Les étudiants qui ont suivi le cours 125-356 ne seront pas admis)

● **FREN 486 L'INSTITUTION LITTÉRAIRE.** (3)

● **FREN 487 L'ESSAI QUÉBÉCOIS.** (3)

FREN 490 CRITIQUE ET THÉORIE. (3) (Winter) (Préalables: pour les étudiants hors-département: 1 cours d'histoire littéraire. Option Lettres: FREN 374, FREN 252, FREN 397; Option Lettres et traduc-

tion: FREN 374, FREN 252. Cours conjoints: Option Lettres: FREN 497) La réflexion critique selon les théories littéraires contemporaines.

● **FREN 491 SÉMINAIRE DE LITTÉRATURE FRANÇAISE 1.** (3) (Réservé aux étudiants inscrits en U2 et U3)

FREN 493 LECTURES 4. (3) (Fall) (Cours réservé aux étudiants du Département. Préalables: Option Lettres: FREN 374, FREN 252, FREN 397; FREN 490, FREN 497; Option Lettres et traduction: FREN 374, FREN 252, FREN 490.) Théories littéraires contemporaines: lecture d'un choix de titres (15) d'après une liste proposée par le Département.

FREN 494 SÉMINAIRE: TRADUCTION SPÉCIALISÉE. (3) (Préalable: FREN 431, 125-446 ou permission du professeur) Ce séminaire a pour but d'approfondir les connaissances dans une perspective d'exercice pratique de la traduction. Il ne s'agit pas de former dans une langue de spécialité quelconque, mais plutôt de faciliter la compréhension de textes portant sur les différentes disciplines ou faisant intervenir les notions propres à celles-ci.

FREN 497 TRAVAUX PRATIQUES 4. (3) (Winter) (Cours réservé aux étudiants du Département de l'Option Lettres. Préalables: FREN 374, FREN 252, FREN 397. Cours conjoints: FREN 490) Analyse descriptive des textes littéraires selon les méthodes, notions et modèles théoriques.

FREN 498 QUESTIONS DE LITTÉRATURE 3. (3) (Cours réservé aux étudiants en Spécialisation du Département. Préalables: Options Lettres: FREN 490, FREN 493, FREN 497; Option Lettres et traduction: FREN 490, FREN 493) Cours à contenu variable: un thème de théorie ou de critique.

● **FREN 499 QUESTIONS DE LITTÉRATURE 4.** (3) (Cours réservé aux étudiants en Spécialisation du Département. Préalables: Options Lettres: FREN 490, FREN 493, FREN 497; Option Lettres et traduction: FREN 490, FREN 493)

FREN 500 LECTURES GUIDÉES 1. (3) (Fall) (Réservé aux étudiants du Département) Lectures personnelles ayant pour but de permettre à l'étudiant de combler une lacune ou de satisfaire un intérêt personnel. Admission sur autorisation spéciale.

FREN 501 LECTURES GUIDÉES 2. (3) (Winter) Identique au précédent.

FRSL – French Second Language

Offered by: English and French Language Centre
Former Teaching Unit Code: 127

All FRSL courses require placement tests and departmental permission. Registration is on a first come, first served basis.

400-level courses are classes in functional French.

FRSL 101D1 BEGINNERS' FRENCH. (3) (3 hours, plus language laboratory and oral practice with a French monitor) (Prerequisite: Placement test) (Not open to students who have taken FRSL 201 or FRSL 205) (Students must also register for FRSL 101D2) (No credit will be given for this course unless both FRSL 101D1 and FRSL 101D2 are successfully completed in consecutive terms) (FRSL 101D1 and FRSL 101D2 together are equivalent to FRSL 101) A comprehensive introduction to basic vocabulary, grammatical structures and speech patterns of written and oral French for students in any degree program having no previous knowledge of French. Learning to communicate at a functional level in a French social milieu, short essays, cultural readings, mandatory lab practice and conversation class.

FRSL 101D2 BEGINNERS' FRENCH. (3) (Prerequisite: FRSL 101D1) (No credit will be given for this course unless both FRSL 101D1 and FRSL 101D2 are successfully completed in consecutive terms) (FRSL 101D1 and FRSL 101D2 together are equivalent to FRSL 101) See FRSL 101D1 for course description.

FRSL 105 INTENSIVE BEGINNERS' FRENCH. (6) (Fall) (6 hours, plus language laboratory and oral practice with a French monitor) (Prerequisite: Placement test) (Not open to students who have taken

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

FRSL 201 or FRSL 205 or FRSL 101) A comprehensive introduction to basic vocabulary, grammatical structures and speech patterns of written and oral French for students in any degree program having no previous knowledge of French. Learning to communicate at a functional level in a French social milieu, short essays, cultural readings, mandatory lab practice and conversation class.

FRSL 206 ELEMENTARY FRENCH. (3) (Fall) (3 hours, plus language laboratory) (Prerequisite: Placement test) Equivalent to the first half of 127-207D. Only with special permission of the Department.

FRSL 207D1 ELEMENTARY FRENCH. (3) (3 hours, plus language laboratory) (Prerequisite: Placement test) (Not open to students who have taken Grade 12 or 13 French in Canada, or equivalent) (Students must also register for FRSL 207D2) (No credit will be given for this course unless both FRSL 207D1 and FRSL 207D2 are successfully completed in consecutive terms) (FRSL 207D1 and FRSL 207D2 together are equivalent to FRSL 207) Review and further training in basic structures, with emphasis on oral expression and listening comprehension. Awareness of French culture developed through audio-visual material and selected readings.

FRSL 207D2 ELEMENTARY FRENCH. (3) (Prerequisite: FRSL 207D1) (No credit will be given for this course unless both FRSL 207D1 and FRSL 207D2 are successfully completed in consecutive terms) (FRSL 207D1 and FRSL 207D2 together are equivalent to FRSL 207) See FRSL 207D1 for course description.

FRSL 208 INTENSIVE ELEMENTARY FRENCH. (6) (6 hours, plus language laboratory) (Prerequisite: Placement test) (Not open to students who have taken Grade 12 or 13 French in Canada, or equivalent or FRSL 207) Review and further training in basic structures, with emphasis on oral expression and listening comprehension.

FRSL 211D1 ORAL AND WRITTEN FRENCH 1. (3) (3 hours, plus language laboratory) (Prerequisite: Placement test. Open to students in any degree program having an elementary knowledge of French and to those who have completed FRSL 207) (Not open to students from Québec) (Students must also register for FRSL 211D2) (No credit will be given for this course unless both FRSL 211D1 and FRSL 211D2 are successfully completed in consecutive terms) (FRSL 211D1 and FRSL 211D2 together are equivalent to FRSL 211) Language lab attendance required. Grammar review, comprehension, vocabulary development, selected readings and group discussions.

FRSL 211D2 ORAL AND WRITTEN FRENCH 1. (3) (Prerequisite: FRSL 211D1) (No credit will be given for this course unless both FRSL 211D1 and FRSL 211D2 are successfully completed in consecutive terms) (FRSL 211D1 and FRSL 211D2 together are equivalent to FRSL 211) See FRSL 211D1 for course description.

FRSL 212 ORAL AND WRITTEN FRENCH 1. (3) (Fall) (3 hours, plus language laboratory) (Prerequisite: Placement test) Equivalent to the first half of FRSL 211. Only with special permission of the Department.

FRSL 215 ORAL AND WRITTEN FRENCH 1 - INTENSIVE. (6) (Fall) (6 hours, plus language laboratory) (Prerequisite: Placement test. Open to students in any degree program having an elementary knowledge of French and to those who have completed FRSL 207) (Not open to students from Québec) Language lab attendance required. Grammar review, comprehension, vocabulary development, selected readings and group discussions.

FRSL 216 DÉCOUVRONS MONTRÉAL EN FRANÇAIS. (3) (3 hours) (Prerequisite: Placement test. Priority given to Freshman students) The course introduces students to various aspects of the French culture of the Montreal area through the exploration of pre-selected sites on the Internet. Students will do research and rallies on-line, followed by evaluated email exchanges, oral discussions, presentations in class, and field trips.

FRSL 302 LISTENING COMPREHENSION AND ORAL EXPRESSION 1. (3) (Fall) (3 hours, plus language laboratory) (Prerequisite: Placement test. For students who have reached a good standard in grammar and written French but who have difficulty in understanding spoken French and therefore cannot communicate effectively)

Focus on oral discrimination, global comprehension and corrective phonetics.

FRSL 303 LISTENING COMPREHENSION AND ORAL EXPRESSION 2. (3) (Winter) (3 hours, plus language laboratory) (Prerequisite: Placement test. Continuation of course FRSL 302) Emphasis will be on the development of oral communication skills, laboratory exercises, vocabulary building, discussions.

FRSL 321D1 ORAL AND WRITTEN FRENCH 2. (3) (3 hours) (Prerequisite: Placement test. For those having taken FRSL 211 or equivalent) (Students must also register for FRSL 321D2) (No credit will be given for this course unless both FRSL 321D1 and FRSL 321D2 are successfully completed in consecutive terms) (FRSL 321D1 and FRSL 321D2 together are equivalent to FRSL 321) Oral work involving discussion and exposés, cultural and literary readings, grammar review. Methodological component integrated in class-work and developed in frequent workshop sessions.

FRSL 321D2 ORAL AND WRITTEN FRENCH 2. (3) (Prerequisite: FRSL 321D1) (No credit will be given for this course unless both FRSL 321D1 and FRSL 321D2 are successfully completed in consecutive terms) (FRSL 321D1 and FRSL 321D2 together are equivalent to FRSL 321) See FRSL 321D1 for course description.

FRSL 322 ORAL AND WRITTEN FRENCH 2. (3) (Fall) (3 hours) Equivalent to the first half of FRSL 321. Only with special permission of the Department.

FRSL 325 ORAL AND WRITTEN FRENCH 2 - INTENSIVE. (6) (Winter) (6 hours) (Prerequisite: Placement test. Priority to students who have taken FRSL 215) The program of FRSL 321 will be covered in one semester.

FRSL 326 DÉCOUVRONS LE QUÉBEC EN FRANÇAIS. (3) (3 hours) (Prerequisite: Placement test. Priority given to Freshman students) The course is the continuation of course FRSL 216. Students will broaden their knowledge of the French language and culture of Québec by exploring pre-selected sites on the Internet. They will conduct research projects, participate in course conferencing, and present their results for class discussions.

FRSL 332 INTERMEDIATE FRENCH: GRAMMAR. (3) (Fall) (3 hours) (Prerequisite: Placement test. For those who have attained relative fluency but lack accuracy in speaking and writing) Grammar review, using both a theoretical and a practical approach. Reading materials, in addition to their cultural interest, are selected to illustrate grammatical usage, provide models of writing techniques and aid in vocabulary development.

FRSL 333 INTERMEDIATE FRENCH: GRAMMAR. (3) (Winter) (3 hours) (Prerequisite: FRSL 332 or Placement test) Second part of FRSL 332.

FRSL 407 COMPRÉHENSION ET EXPRESSION ORALES. (3) (Fall) (3 heures par semaine) (Préalable: test de classement. S'adresse aux étudiants qui ont déjà une bonne maîtrise du français écrit) Identification des niveaux de langue et prononciation du français familier; amélioration de la compréhension auditive par l'écoute d'une variété de documents audio-visuels du Québec et d'ailleurs.

FRSL 408 FRANÇAIS ORAL: TEXTES ET EXPRESSIONS. (3) (3 heures par semaine) (Préalable: test de classement) Suite du cours FRSL 407. Cours de perfectionnement de l'expression orale et écrite: amélioration de la production orale (intonation, débit, spontanéité); enrichissement du vocabulaire idiomatique relié à des fonctions socio-culturelles de la langue par le biais de techniques orales (jeux de rôles, discussions, simulations) et d'un journal.

FRSL 431D1 FRANÇAIS FONCTIONNEL AVANCÉ. (3) (3 heures par semaine) (Préalable: test de classement) (Les étudiants qui ont suivi le cours FRSL 400, FRSL 402 ou FRSL 432 ne seront pas admis) (Students must also register for FRSL 431D2) (No credit will be given for this course unless both FRSL 431D1 and FRSL 431D2 are successfully completed in consecutive terms) (FRSL 431D1 and FRSL 431D2 together are equivalent to FRSL 431) Destiné aux étudiants de niveau avancé qui veulent approfondir leurs connaissances lexicales, syntaxiques et culturelles afin de pouvoir exprimer avec clarté leurs opinions sur une variété de sujets. Par

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

l'étude de journaux, revues et textes littéraires, les étudiants se familiariseront avec la réalité québécoise contemporaine.

FRSL 431D2 FRANÇAIS FONCTIONNEL AVANCÉ. (3) (Prerequisite: FRSL 431D1) (No credit will be given for this course unless both FRSL 431D1 and FRSL 431D2 are successfully completed in consecutive terms) (FRSL 431D1 and FRSL 431D2 together are equivalent to FRSL 431) See FRSL 431D1 for course description.

FRSL 432 FRANÇAIS FONCTIONNEL. (3) (Fall) (3 heures par semaine) (Préalable: test de classement) Première moitié du programme du cours FRSL 431. Seulement avec la permission spéciale du département.

FRSL 445 FRANÇAIS FONCTIONNEL, ÉCRIT 1. (3) (Fall) (3 heures par semaine) (Préalable: test de classement) Destiné aux étudiants dont le français oral est d'un niveau fonctionnel, mais dont le français écrit est nettement inférieur. Travaux écrits hebdomadaires, analyse de textes divers, exercices et tests en classe. But: corriger l'orthographe, la grammaire et les anglicismes, enrichir le vocabulaire, améliorer l'expression écrite.

FRSL 446 FRANÇAIS FONCTIONNEL, ÉCRIT 2. (3) (Winter) (3 heures par semaine) (Préalable: test de classement) (Prépare aux cours du Département de langue et littérature françaises. Même format que le cours FRSL 445, à un niveau plus avancé) Rédactions de types variés. But: améliorer le style, développer les compétences telles que l'organisation et la présentation d'arguments ou l'identification des registres de langue.

FRSL 449 LE FRANÇAIS DES MÉDIAS. (3) (3 heures par semaine) (Préalable: test de classement) Cours de perfectionnement mettant l'accent sur l'enrichissement de la langue à l'oral comme à l'écrit. Analyse d'émissions de télévision ou de radio et lecture d'articles de journaux ou de revues. Activités variées portant sur des sujets d'actualité (reportages, débats, etc.) qui reflètent la société et la culture du Québec d'aujourd'hui.

FRSL 455 GRAMMAIRE ET CRÉATION. (3) (3 heures par semaine) (Préalable: test de classement) Perspective analytique et approche inductive et visuelle se combinent pour permettre une meilleure maîtrise du code grammatical. L'étude de textes de niveau soutenu met en relief la richesse des ressources lexicales et stylistiques du français et rend accessible la création littéraire aux étudiants non francophones.

GERM – German (Arts)

Offered by: Department of German Studies
Former Teaching Unit Code: 129

GERM 197 FYS: IMAGES OF OTHERNESS. (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) (Given in English) The seminar examines images and narratives of the foreign, alien, and uncanny Other in major works of German literature, film, music, and art from Romanticism to the present. Works discussed include Wagner's *Lohengrin*, expressionist art, and texts by authors such as ETA Hoffmann, Kleist, Freud, Nietzsche, Kafka, and Thomas Mann.

GERM 200 GERMAN LANGUAGE, INTENSIVE BEGINNERS'. (6) (Fall) (6 hours, plus 1 hour laboratory) An intensive language course designed to develop communicative skills; covers the first level (GERM 202D1/GERM 202D2) in one term. Required for program students.

GERM 202D1 GERMAN LANGUAGE, BEGINNERS. (3) (Fall) (Students must also register for GERM 202D2) (No credit will be given for this course unless both GERM 202D1 and GERM 202D2 are successfully completed in consecutive terms) (GERM 202D1 and GERM 202D2 together are equivalent to GERM 202) A comprehensive first level course designed to develop communicative skills.

GERM 202D2 GERMAN LANGUAGE, BEGINNERS. (3) (Winter) (Prerequisite: GERM 202D1) (No credit will be given for this course

unless both GERM 202D1 and GERM 202D2 are successfully completed in consecutive terms) (GERM 202D1 and GERM 202D2 together are equivalent to GERM 202) See GERM 202D1 for course description.

GERM 259 INDIVIDUAL AND SOCIETY IN GERMAN LITERATURE 1. (3) (Fall) (Given in English) This course provides an overview of the history of German literature and culture from the Middle Ages to Goethe through a study of representative texts in English translation.

GERM 260 INDIVIDUAL AND SOCIETY IN GERMAN LITERATURE 2. (3) (Winter) (Given in English) This course provides a continuation of the overview of the history of German literature and culture from Goethe to the present through a study of representative texts in English translation.

GERM 300 GERMAN LANGUAGE INTENSIVE INTERMEDIATE. (6) (Winter) (6 hours, plus 1 hour laboratory) (Prerequisite: GERM 200 or equivalent, or permission of Department) (Required for program students) Continuation of GERM 200; covers the second level (GERM 307D1/GERM 307D2) in one term.

GERM 307D1 GERMAN LANGUAGE - INTERMEDIATE. (3) (Fall) (Students must also register for GERM 307D2) (No credit will be given for this course unless both GERM 307D1 and GERM 307D2 are successfully completed in consecutive terms) (GERM 307D1 and GERM 307D2 together are equivalent to GERM 307) Review of grammar, further development of basic skills; literary and cultural readings.

GERM 307D2 GERMAN LANGUAGE - INTERMEDIATE. (3) (Winter) (Prerequisite: GERM 307D1) (No credit will be given for this course unless both GERM 307D1 and GERM 307D2 are successfully completed in consecutive terms) (GERM 307D1 and GERM 307D2 together are equivalent to GERM 307) See GERM 307D1 for course description.

GERM 325 GERMAN LANGUAGE - INTENSIVE ADVANCED. (6) (Fall and Winter) (6 hours) (Prerequisite: GERM 300 or equivalent, or permission of Department. Required for program students) This course aims at developing post-intermediate proficiency in listening, speaking, reading, and writing skills, with emphasis on oral and written expression. Special attention is given to word formation and to the proper choice of grammatical structures, vocabulary, and phraseology.

GERM 330 LANDESKUNDE. (3) (Winter) (Given in German) (Prerequisite: GERM 300 or GERM 307, or equivalent, or permission of Department. Can be taken concurrently with GERM 325 / GERM 336) Introduction to images of modern Germany, perceptions and conceptions of Germany since the Second World War.

● **GERM 331 GERMANY AFTER REUNIFICATION.** (3) (Given in German) (Prerequisite: GERM 325 or equivalent, or permission of the Department)

GERM 336 GERMAN GRAMMAR REVIEW. (3) (Fall) (Given in German) This advanced-level course offers a comprehensive review of basic German grammar. The course can be taken concurrently with a language course at the third level.

● **GERM 341 ESSAY WRITING.** (3) (Winter) (Given in German) (Prerequisite: GERM 325 or equivalent, or permission of Department)

GERM 342 TRANSLATION. (3) (Winter) (Given in German) (Prerequisite: GERM 325 or equivalent, or permission of Department) An introductory course, emphasizing practice more than theory. It covers mainly written translation (from German into English), i.e. reading and writing, and teaches to analyze, and to manipulate, grammatical/syntactical structures and to get a sense of semantic accuracy. The course is designed to familiarize students with basic technical terminology and to enable them to observe, analyze and produce accurate and appropriate translations. Vocabulary building is not a main issue.

GERM 345 BUSINESS GERMAN 1. (3) (Fall) (Given in German) (Prerequisite: GERM 325 or equivalent, or permission of the Department) This course introduces students to the terminology

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

and syntax of Business German in contrast with English to ensure a sound basis for business communication.

GERM 346 BUSINESS GERMAN 2. (3) (Winter) (Given in German) (Prerequisite: GERM 345 or equivalent, or permission of the Department) This course is designed to develop oral and written skills for competence in German for business communication as well as cross-cultural awareness by discussing current materials from various sources.

GERM 352 GERMAN LITERATURE - 19TH CENTURY. (3)

- **GERM 353 19TH CENTURY LITERARY TOPICS.** (3) (Given in German) (Prerequisite: GERM 325, or equivalent, or permission of the Department)

- **GERM 354 LITERARY APPROACH TO SONG.** (3) (Prerequisite(s): No official prerequisite, but students should have GERM 307 or equivalent.)

- **GERM 355 NIETZSCHE AND WAGNER.** (3) (Winter) (Given in English)

- **GERM 358 FRANZ KAFKA.** (3) (Winter) (Given in English)

- **GERM 359 BERTOLT BRECHT.** (3) (Given in English)

- **GERM 360 GERMAN LITERATURE 1890 TO 1918.** (3) (Given in German) (Prerequisite: Germ 325 or equivalent)

GERM 361 GERMAN LITERATURE 1918 TO 1945. (3) (Winter) (Given in German) (Prerequisite: Germ 325 or equivalent) The course deals with the culture, literature and society of the Weimar Republic and the period of the Third Reich and the Holocaust. Writers studied will include: Brecht, Seghers, Fleisser, Kästner, Tucholsky, Benn, Kolmar, and Lasker-Schüler.

- **GERM 362 20TH CENTURY LITERATURE TOPICS.** (3) (Fall) (Given in German) (Prerequisite: Germ 325 or equivalent)

GERM 363 GERMAN POSTWAR LITERATURE. (3) (Fall) (Given in German) (Prerequisite: Germ 325 or equivalent) The course deals with the literature and culture of the Federal Republic of Germany, the former German Democratic Republic and unified Germany since 1945. It treats major authors and trends. Topics addressed include issues of nationalism and gender, multiculturalism, and other concerns of contemporary German society.

- **GERM 364 GERMAN CULTURE: GENDER AND SOCIETY.** (3) (Given in English)

GERM 366 POSTWAR GERMAN LITERATURE/FILM. (3) (Fall) (Given in English) The course is a study of postwar German literature and film, focusing on the cinematic representation of literary texts. The emphasis is on the representation of German history in both media, on historical memory and gender relations.

- **GERM 367 TOPICS IN GERMAN THOUGHT.** (3) (Given in English)

- **GERM 371 CULTURAL CHANGE AND EVOLUTION OF GERMAN.** (3) (Given in English)

GERM 380 18TH CENTURY GERMAN LITERATURE. (3) (Winter) (Given in German) (Not open to students who have taken GERM 380 and/or GERM 381) (Prerequisite: Germ 325 or equivalent) An introduction to German literature of the 18th century: Enlightenment and Sturm und Drang. The course will follow a socio-historical approach, i.e. it will attempt to delineate some of the relations that exist between the texts and their social, political, and cultural context.

GERM 382 FAUST IN EUROPEAN LITERATURE. (3) (Winter) (Given in English.) The Faust theme is as old as Christianity. The course traces its development from pre-Faust legends and the Chapbook through Christopher Marlowe's Dr. Faustus and Goethe's Faust to recent works.

GERM 397 INDIVIDUAL READING COURSE. (3) (Fall) Given solely at the discretion of the instructor.

GERM 398 INDIVIDUAL READING COURSE. (3) (Winter) Given solely at the discretion of the instructor.

GERM 400 INTERDISCIPLINARY SEMINAR: CONTEMPORARY GERMAN STUDIES. (3) (Winter) (Given in English) An interdisciplinary, team-taught seminar, for third-year students on a single topic or theme. Topics may vary from year to year.

GERM 412 HEROES, LOVERS AND CRUSADERS. (3) Representations of the hero in medieval German literature, his socio-political, cultural, and religious roles.

GERM 450 CLASSICAL PERIOD IN GERMAN LITERATURE. (3) (Winter) (Given in German) (Prerequisite: Germ 325 or equivalent) For the most part, the works of Goethe and Schiller are discussed.

- **GERM 451 GERMAN ROMANTICISM.** (3) (Given in German) (Prerequisite: Germ 325 or equivalent)

GERM 455 WOMEN OF THE ROMANTIC ERA. (3) (Prerequisite: GERM 325 or equivalent.) (Course is given in German for advanced undergraduate program students.) This course places at its centre the life-worlds, biographies, and forms of self-expression by German women of the Romantic Era.

GERM 497 INDIVIDUAL READING COURSE. (3) (Fall) Given solely at the discretion of the instructor.

GERM 498 INDIVIDUAL READING COURSE. (3) (Winter) Given solely at the discretion of the instructor.

GERM 511 MIDDLE HIGH GERMAN LITERATURE. (3) (Fall) (Given in German) (Prerequisite: Germ 325 or equivalent) This seminar course will acquaint students with the German courtly literature of the 12th and 13th century, its concepts, concerns and its sociology. The knightly romances of Hartmann von Aue (Erec), Wolfram von Eschenbach (Parzival), Gottfried von Straßburg (Tristan), and the heroic epic (Nibelungenlied) will be read and discussed in class, Hartmann's Erec in the original MHG language as well as in translation, to give students a basic acquaintance with the Middle High German literary language. Writers studied will include: Hartmann von Aue, Gottfried von Straßburg, Wolfram von Eschenbach.

- **GERM 561 GERMAN LITERATURE: BAROQUE.** (3)

GERM 570 JOINT HONOURS THESIS. (3) (Fall or Winter) (For students in the Joint Honours Program only.)

HISP – Hispanic Studies (Arts)

Offered by: Department of Hispanic Studies

Former Teaching Unit Code: 144

All Hispanic Studies courses, including HISP 210D1/HISP 210D2 and HISP 202D1/HISP 202D2 after the first weeks, are given in Spanish or Portuguese, with the exception of HISP 225 and HISP 226 which are given in English.

Note: the prerequisite for all courses taught in Spanish and numbered at the 300-level or above is completion of any Survey of Literature (HISP 241, HISP 242, HISP 243, HISP 244) or permission of the instructor.

Students who have not completed a language course in the Department of Hispanic Studies may be required to take a placement test prior to registration in any Spanish language course above the elementary level.

Students wishing to take an intermediate language course without having taken the Beginner's language course at McGill, must see the Department for permission. Preference will be given to students enrolled in programs requiring these courses.

HISP 202D1 PORTUGUESE LANGUAGE: BEGINNERS. (3) (Fall) (4 hours weekly, including laboratory) (Departmental approval required) (Restricted to beginners only) (Students must also register for HISP 202D2) (No credit will be given for this course unless both HISP 202D1 and HISP 202D2 are successfully completed in consecutive terms) A comprehensive first-year course in speaking, reading and writing. Selected readings in Portuguese and Brazilian literature.

HISP 202D2 PORTUGUESE LANGUAGE: BEGINNERS. (3) (Winter) (Prerequisite: HISP 202D1) (No credit will be given for this course unless both HISP 202D1 and HISP 202D2 are successfully completed in consecutive terms) See HISP 202D1 for course description.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

HISP 204D1 PORTUGUESE LANGUAGE: INTERMEDIATE. (3) (Fall) (Prerequisite: HISP 202D1/HISP 202D2 or equivalent) (Departmental approval required) (Students must also register for HISP 204D2) (No credit will be given for this course unless both HISP 204D1 and HISP 204D2 are successfully completed in consecutive terms) Review of grammar. Practice in speaking and writing. Composition. Selected readings in Portuguese and Brazilian literature.

HISP 204D2 PORTUGUESE LANGUAGE: INTERMEDIATE. (3) (Winter) (Prerequisite: HISP 204D1) (No credit will be given for this course unless both HISP 204D1 and HISP 204D2 are successfully completed in consecutive terms) See HISP 204D1 for course description.

HISP 210 SPANISH LANGUAGE: BEGINNERS. (6) (Summer) (Not open to students who have taken HISP 218 or equivalent)

HISP 210D1 SPANISH LANGUAGE: BEGINNERS. (3) (Fall) (Not open to students who have taken HISP 218 or equivalent) (4 hours weekly, including laboratory) (Students must also register for HISP 210D2) (No credit will be given for this course unless both HISP 210D1 and HISP 210D2 are successfully completed in consecutive terms) (HISP 210D1 and HISP 210D2 together are equivalent to HISP 210) (Preference will be given to students in their first year of university study. Students in or entering U3 may not pre-register for this course but will be admitted, as space allows, during the Fall registration period) A comprehensive first-level course focusing on all oral and written skills. An introduction to the fundamentals of Spanish grammar and syntax and to Hispanic culture.

HISP 210D2 SPANISH LANGUAGE: BEGINNERS. (3) (Winter) (4 hours weekly, including laboratory) (Prerequisite: HISP 210D1) (No credit will be given for this course unless both HISP 210D1 and HISP 210D2 are successfully completed in consecutive terms) (HISP 210D1 and HISP 210D2 together are equivalent to HISP 210) See HISP 210D1 for course description.

HISP 218 SPANISH LANGUAGE INTENSIVE - ELEMENTARY. (6) (Fall and Winter) (7 hours weekly, including laboratory) (Not open to students who have taken HISP 210 or equivalent) (Preference will be given to students in their first year of university study. Students in or entering U3 may not pre-register for this course but will be admitted, as space allows, during the Fall registration period) A comprehensive first-level course focusing upon all oral and written skills. An introduction to the fundamentals of Spanish grammar and syntax and to Hispanic culture.

HISP 219 SPANISH LANGUAGE INTENSIVE - INTERMEDIATE. (6) (Fall and Winter) (7 hours weekly, including laboratory) (Prerequisite: HISP 210 or HISP 218 or equivalent) (Departmental approval required) (Preference will be given to students in their first year of university study) (Not open to students who have taken HISP 220D1/HISP 220D2 or equivalent) A thorough review of Spanish grammar with emphasis upon current usage. Enrichment of all language skills, with a goal of proficiency in written and oral communication, through readings in the literature and civilization of Spain and Spanish America.

HISP 220D1 SPANISH LANGUAGE: INTERMEDIATE. (3) (Fall) (Not open to students who have taken HISP 219 or equivalent) (Students must also register for HISP 220D2) (No credit will be given for this course unless both HISP 220D1 and HISP 220D2 are successfully completed in consecutive terms) (Departmental approval required) A thorough review of Spanish grammar with emphasis upon current usage. Enrichment of all language skills, with a goal of proficiency in written and oral communication, through readings in the literature and civilization of Spain and Spanish America.

HISP 220D2 SPANISH LANGUAGE: INTERMEDIATE. (3) (Winter) (Prerequisite: HISP 220D1) (No credit will be given for this course unless both HISP 220D1 and HISP 220D2 are successfully completed in consecutive terms) See HISP 220D1 for course description.

HISP 225 HISPANIC CIVILIZATION 1. (3) (Fall) (Taught in English) A survey of historical and cultural elements which constitute the background of the Hispanic world up to the 18th century; a survey of the

pre-Columbian indigenous civilizations (Aztec, Maya and Inca) and the conquest of America.

HISP 226 HISPANIC CIVILIZATION 2. (3) (Winter) (Taught in English) A survey of the constitution of the ideological and political structures of the Spanish Empire in both Europe and America until the Wars of Independence; a survey of the culture and history of the Hispanic people from the early 19th Century to the present.

HISP 241 SURVEY OF SPANISH LITERATURE 1. (3) (Fall) (Taught in Spanish) (Prerequisite: successful completion of HISP 220, HISP 219 or equivalent) From the origins to the Golden Age through a study of representative works.

HISP 242 SURVEY OF SPANISH LITERATURE 2. (3) (Winter) (Taught in Spanish) (Prerequisite: successful completion of HISP 219 or CEGEP course 607-401, or Corequisite HISP 220, or equivalent) From the Golden Age to the modern period through a study of representative works.

HISP 243 SURVEY OF SPANISH-AMERICAN LITERATURE 1. (3) (Fall) (Taught in Spanish) (Prerequisite: successful completion of HISP 220D1/HISP 220D2, HISP 219 or equivalent) From the Colonial period to Modernism through a study of representative works.

HISP 244 SURVEY OF SPANISH-AMERICAN LITERATURE 2. (3) (Winter) (Taught in Spanish) (Prerequisite: HISP 220D1/HISP 220D2, HISP 219 or equivalent) From Modernism to the present through a study of representative works.

● **HISP 321 SPANISH LITERATURE - 18TH CENTURY.** (3)

HISP 324 20TH CENTURY DRAMA. (3) Satirical drama and theatre of social protest. Literatura comprometida. García Lorca and Casona; Buero Vallejo, Sastre, Olmo, Muñoz, Arrabal and others.

● **HISP 325 SPANISH NOVEL OF THE 19TH CENTURY.** (3) (Not open to students who have taken HISP 325)

● **HISP 326 SPANISH ROMANTICISM.** (3)

● **HISP 327 LITERATURE OF IDEAS: SPAIN.** (3)

HISP 328 LITERATURE OF IDEAS: SPANISH AMERICA. (3) Critical reading and discussion of works of outstanding thinkers as a key to understanding the cultural development of a continent.

HISP 332 SPANISH-AMERICAN LITERATURE OF 19TH CENTURY. (3) An intensive study of representative authors from the period of Independence to the advent of Modernism.

HISP 350 GENERATION - 1898: CREATIVE GENRES. (3) An examination of developments in prose fiction, drama, and poetry by representative authors of the Generation of 1898 in Spain (Unamuno, Azorín, Baroja, Machado).

HISP 351 SPANISH-AMERICAN NOVEL: 1900 - 1950. (3) Representative authors of the first half of the 20th Century. The novel of the land; the Indianist novel; the novel of the Mexican Revolution.

● **HISP 352 CONTEMPORARY SPANISH-AMERICAN NOVEL.** (3)

● **HISP 356 SPANISH-AMERICAN SHORT STORY.** (3)

● **HISP 358 WOMEN WRITERS FICTION SPANISH-AMERICA.** (3)

● **HISP 421 GOLDEN AGE PROSE.** (3)

● **HISP 424 SPANISH NOVEL SINCE CIVIL WAR.** (3)

● **HISP 425 THE WORLD OF PÉREZ GALDÓS.** (3) (Not open to students who have taken HISP 325)

● **HISP 432 LITERATURE - DISCOVERY AND EXPLORATION SPAIN NEW WORLD.** (3)

HISP 434 DICTATORSHIP: HISPANIC AMERICA. (3) The dictator as protagonist and social type, and as subject for treatment by different literary schools. Influence of historical and sociological components. Critical analysis of the dictator's role and personality development. Representative works will be studied.

HISP 437 VICEREGAL SPANISH AMERICA. (3) Selected topics in the historiography, literature and culture of Spanish America prior to Independence.

HISP 442 MODERNISMO. (3) A study of the Modernist School of Spanish American authors.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

- **HISP 451D1 CERVANTES.** (3) (Fall) (Students must also register for HISP 451D2)
- **HISP 451D2 CERVANTES.** (3) (Prerequisite: HISP 451D1)
- **HISP 453 SPANISH-AMERICAN POETRY: MODERNISMO AND AFTER.** (3) (Fall)
- **HISP 458 GOLDEN AGE DRAMA.** (3)
- **HISP 460 GOLDEN AGE POETRY.** (3) (Given in alternate years)

HISP 470 TUTORIAL. (3)

HISP 471 TUTORIAL. (3)

- **HISP 490 HONOURS THESIS.** (6)

HISP 490D1 HONOURS THESIS. (3) (Students must also register for HISP 490D2) (No credit will be given for this course unless both HISP 490D1 and HISP 490D2 are successfully completed in consecutive terms) (HISP 490D1 and HISP 490D2 together are equivalent to HISP 490)

HISP 490D2 HONOURS THESIS. (3) (Prerequisite: HISP 490D1) (No credit will be given for this course unless both HISP 490D1 and HISP 490D2 are successfully completed in consecutive terms) (HISP 490D1 and HISP 490D2 together are equivalent to HISP 490) See HISP 490D1 for course description.

- **HISP 501 HISTORY OF THE SPANISH LANGUAGE.** (3) (Prerequisite: Permission of the instructor)

HIST – History

Offered by: Department of History
Former Teaching Unit Code: 101

- **HIST 196 FYS: WEATHER/CLIMATE/HISTORY.** (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) (For first year students only.) (Not open to students who have taken ATOC 199.)

HIST 197 FYS: RACE IN LATIN AMERICA. (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) This seminar explores what it meant to be native, black, or white in Latin America from the colonial period to the present. It explores how conceptualisations of race and ethnicity shaped colonialism, social organisation, opportunities for mobility, visions of nationhood, and social movements.

HIST 198 FYS: NATION BUILDING AND NATIONALISM. (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) An introduction to some of the major theories of nationalism; an exploration of the many varieties of nationalism and forms of nation-building; a particular focus on the historical background to three case studies of current interest: Yugoslavia, Ireland and Québec.

- **HIST 199 FYS: MEDIEVAL WOMEN AND MEN.** (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25)

HIST 200 INTRODUCTION TO AFRICAN HISTORY. (3) (Fall) (Not open to students who have taken 101-200D) This course stresses the interactions of the peoples of Africa with each other and with the worlds of Europe and Islam from the Iron Age to the European Conquest in 1880.

HIST 201 MODERN AFRICAN HISTORY. (3) (Winter) (Not open to students who have taken 101-200D) While covering the general political history of Africa in the twentieth century, this course also explores such themes as health and disease, gender, and urbanization.

HIST 202 SURVEY: CANADA TO 1867. (3) (Fall) A survey of the development of Canada, from the pre-Columbian explorations until the Confederation period. Social, economic and political history will be examined in a general way.

HIST 203 SURVEY: CANADA SINCE 1867. (3) (Winter) A survey of the development of Canada from Confederation to the present day. Social, economic and political history will be examined in a general way.

HIST 204 HISTORY OF GREAT BRITAIN TO 1688. (3) A survey of the development of Britain from the Middle Ages to the Glorious Revolution. Emphasis on political changes, seen in relation to the economic, social and intellectual background.

HIST 205 ANCIENT GREEK HISTORY. (3) A survey of Ancient Greek History from the origins to the Roman Conquest. The Roman continuation of this course is HIST 209.

HIST 207 JEWISH HISTORY: 400 B.C.E. TO 1000. (3) An overview of Jewish history from the period of Ezra and Nehemiah to the death of Hai Gaon, c. 1035. Focus on the experience of the Jews in Hellenistic and Islamic civilizations. Topics include Jewish sects, rabbinic literature in its various genres, the Karaite schism, and the rise of the Gaonate.

HIST 208 INTRODUCTION TO EAST ASIAN HISTORY. (3) (Fall) (Not open to students who have taken 101-208D) An introduction to the history of East Asian civilization from earliest times to 1800, with emphasis on China and Japan. This course covers social, intellectual, and economic developments as well as political history. The sequel to this course is HIST 218.

HIST 209 ANCIENT ROMAN HISTORY. (3) A survey of Roman history.

HIST 211 AMERICAN HISTORY TO 1865. (3) (Fall) Introduction to the history of colonial North America and the United States up to the Civil War, in their Atlantic context.

HIST 214 INTRODUCTION TO EUROPEAN HISTORY. (3) (Fall) (Not open to students who have taken 101-215D) The course covers European History from the Ancient Greeks to the first part of the seventeenth century. The object of the course is two-fold, to provide students with: 1) a number of essential canons of pre-modern history; 2) hands-on experience in the reading, interpretation and writing of history.

HIST 215 MODERN EUROPEAN HISTORY. (3) (Winter) (Not open to students who have taken 101-215D) A social, economic, political and cultural survey of European History from the early seventeenth century to the present.

HIST 216 HISTORY OF RUSSIA TO 1801. (3) A survey of Russian history, from the origin of the Slavs to the establishment of the Kievan State, the coming of the Mongols, the emergence of Muscovy, and the rise of the Russian Empire.

- **HIST 217 A SURVEY OF SPANISH HISTORY.** (3)

HIST 218 MODERN EAST ASIAN HISTORY. (3) (Winter) An introduction to the history of China and Japan in the nineteenth and twentieth centuries. Issues such as modernization, nationalism, and the interaction of the two countries are discussed.

HIST 219 JEWISH HISTORY: 1000-2000. (3) The Jewish experience from the rise of the European centres to the present.

HIST 221 UNITED STATES SINCE 1865. (3) (Winter) Examines the defining moments and movements in the U.S. since Reconstruction, including populism, progressivism, the World Wars, the New Deal, the Cold War, the sixties and its consequences. Emphasis on the political, social and ideological transformations that ensued.

HIST 225 HISTORY OF FRANCE TO 1789. (3) Survey of French society from the fall of the Roman Empire to the outbreak of the French Revolution. Emphasis on the construction of the French state in the medieval period, religious conflicts of the 16th century, social and economic structures under absolutism, intellectual and economic changes in the 18th century.

HIST 226 EASTERN EUROPE IN 20TH CENTURY. (3) Introductory survey of the region's history from the twilight of imperialism in the 1890s to the post-Communist 1990s. Consideration will be given to Russia and the Soviet Union, the Balkans, Austria-Hungary and its successors; the impacts of two World Wars, communism, nationalism, and fascism; and the revolutions of 1989/91.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

● **HIST 234 GERMAN HISTORY TO 1648.** (3) (Fall) (Not open to students who have taken 101-235D)

● **HIST 235 GERMAN HISTORY SINCE 1648.** (3) (Winter) (Prerequisite: HIST 214 or HIST 234) (Not open to students who have taken 101-235D)

HIST 236 RUSSIA FROM 1801 TO 1991.(3)

HIST 292 HISTORY AND THE ENVIRONMENT. (3) Sketch of the history of the material aspects of human interaction with the rest of nature. Included will be a historian's view of the social, technical, and ecological implications of the great variety of activities devised by our species. Though global in outlook, this course will emphasize the relevant historiography of France, England and North America.

HIST 301 U.S. PRESIDENTIAL CAMPAIGNING. (3) (Prerequisite: any course in U.S. history or consent of instructor) The history of presidential campaigning in the U.S. will be considered against the backdrop of party change, technological development and the growth of American democracy.

HIST 303 HISTORY OF QUEBEC. (3) (Prerequisite: HIST 202/HIST 203) (The ability to read French is helpful but not mandatory) Covering Quebec history from New France to contemporary times, this course will include themes like ethnic relations, citizenship, gender and material culture. It is of particular interest to students in Education who foresee teaching about Quebec.

HIST 305 WAR AND SOCIETY 1. (3) (Prerequisite: one general course in European history) (Not open to students who have taken 101-305D. Not open to U0 students) War in Roman, Carolingian, and feudal society. The sequel to this course is HIST 317.

HIST 307 JEWS IN POLAND. (3) (Prerequisite: any course in Jewish history or East European History) (Not open to students who have taken 101-307D) Analyses of primary sources (in translation) related to the social, economic and institutional history of the Jews in Poland and their place in the East European Jewish community. Topics include: the Jews during "The Flood" (1648 - 1667), the communal crisis of the late 17th century, the Frankist movement, and Hasidism.

HIST 308 FORMATION OF CHINESE TRADITION. (3) (Not open to students who have taken 101-308D) An examination of the multiple sources of the Chinese imperial system from the period of the neolithic culture interaction sphere to the fall of the Han dynasty in 220 C.E. Special attention is paid to socio-economic developments as well as to the evolution of philosophy, ideology, and social practice. The sequel to this course is HIST 358.

HIST 309 HISTORY OF LATIN AMERICA TO 1825. (3) (Fall) The social, cultural, and economic aspects of Latin America and the Caribbean in the colonial period. Topics include: pre-Columbian and hispanic cultures in conflict, plantation empires, and the transition to independence. The sequel to this course is HIST 360.

HIST 311 THEODORE ROOSEVELT AND PROGRESSIVE ERA. (3) (Prerequisite: any course in U.S. history or consent of instructor) The origins, life and decline of American Progressivism (1890 - 1920) against a background of rapid industrial growth, imperialism, war and "normalcy". Emphasis on the philosophy and ambitions of Theodore Roosevelt, Progressivism's political goals in cities and states, its historiography and its legacy.

HIST 312 EAST-CENTRAL EUROPE: 1453-1740. (3) Developments from the fall of Constantinople to the accession of Maria Theresa; the Ottoman impact; the Renaissance in Hungary and Poland; the emergence of the Hapsburg Empire; the Reformation and Counter-Reformation; the Thirty Years' War; the imposition of serfdom; the decline of Poland-Lithuania and the collapse of the Ottoman system. East Central Europe as a frontier region between Catholicism, Orthodoxy and Islam.

HIST 313 EAST-CENTRAL EUROPE: 1740-1914. (3) History of the Austro-Hungarian Empire, Poland and the Balkans from the Age of Enlightenment to the outbreak of WW II. Special consideration will be given to the implications of serfdom and emancipation; the Romantic movement and rise of nationalism; modernization and the struggle to maintain stability.

HIST 314 TUDOR ENGLAND. (3) (Prerequisite: HIST 204 or permission of instructor) A study of British society, politics, and thought from the end of the Middle Ages to the 17th century. Topics include: the developments of the Tudor state; the Reformation, and England's interaction with other European powers. The sequel to this course is HIST 394.

● **HIST 316 RUSSIA: REVOLUTIONS 1905 AND 1917.** (3) (Prerequisite: A course in Russian, Soviet or European history)

HIST 317 WAR AND SOCIETY 2. (3) (Winter) (Prerequisite: one general course in European history or HIST 305) (Not open to students who have taken 101-305D. Not open to U0 students) The rise of permanent armies and navies, military institutions of Eastern Europe; Warfare from Wallenstein to Napoleon; emergence of the national army in Russia; the Western military tradition after Clausewitz, total War in the twentieth century.

● **HIST 318 HISTORY OF JAPAN 1.** (3) (Not open to students who have taken 101-318D or 101-293A)

HIST 319 THE SCIENTIFIC REVOLUTION. (3) (Prerequisite: a 200-level course in early modern history, or a survey course in philosophy, or permission of the instructor) The shift from the medieval to the modern view of man's place in the universe that took place between Copernicus and Newton and its intellectual and social implications.

HIST 320 EUROPEAN THOUGHT AND CULTURE 1. (3) (Prerequisite: HIST 214 or HIST 215) (Not open to students who have taken 101-320D) The cultural and intellectual history of Europe from the late Middle Ages to the 18th century traces the origins of the modern sense of self in popular culture and in the texts of Erasmus, Luther, Calvin, Descartes, Pascal, Voltaire and Rousseau.

HIST 321 EUROPEAN THOUGHT AND CULTURE 2. (3) (Prerequisite: HIST 320 or consent of the instructor) (Not open to students who have taken 101-320D) A cultural and intellectual history of Europe from the French Revolution to the present which traces the origins of the modern sense of self in popular culture and in the texts of Goethe, Comte, Marx and Engels, Nietzsche, Dostoevsky.

HIST 322 CANADA: AMERICAN PRESENCE SINCE 1939. (3) (Prerequisite: HIST 202 and HIST 203 or consent of instructor) An examination of Canada's relationship with the United States in the modern era. Emphasis will be placed upon diplomatic, military, cultural, and economic facets of this relationship.

● **HIST 324 HISTORY OF IRELAND.** (3)

HIST 325 RENAISSANCE-REFORMATION EUROPE. (3) (Prerequisite: HIST 214 or consent of instructor) (Not open to students who have taken 101-325D) An examination of Western Europe from the late 15th to the mid-17th century. Topics will include the Renaissance outside Italy, the Reformations, popular religion and culture, the religious wars and the Scientific Revolution.

● **HIST 326 RUSSIA FROM 1905 TO PRESENT.** (3) (Prerequisite: one 200-level course in History or political theory) 20th Century Russia, with particular attention to the rise and fall of the Soviet regime, Gorbachev's Perestroika, and the problems and accomplishments of post-Soviet society under Yeltsin and Putin.

● **HIST 327 JEWS IN THE ORBIT OF ISLAM.** (3) (Prerequisite: HIST 207 and HIST 237 or consent of instructor)

HIST 328 CHINA IN REVOLUTION 1: 1840-1921. (3) (Prerequisite: One previous course in Chinese or Asian history or permission of instructor) An examination of political, economic and social developments in China in the 19th century, a period when internal crises and Western imperialism wrought cataclysmic changes. Topics include the Opium War, the Taiping Rebellion, the Boxers, and the Republican Revolution. The sequel to this course is HIST 338.

● **HIST 329 EASTERN EUROPE: 4TH CENTURY - 1453.** (3) (Prerequisite: One European History course or consent of instructor)

HIST 331 F.D. ROOSEVELT AND THE NEW DEAL. (3) (Prerequisite: HIST 211 and HIST 221 or consent of instructor) The era of Franklin Roosevelt (1933 - 1945) with particular emphasis upon roots, goals, methods and the historiography of the New Deal. Political leadership, both domestic and foreign, will also be stressed.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

HIST 332 CONSTITUTIONAL HISTORY: CANADA - 1867. (3) (Prerequisite: one course in Canadian history or consent of instructor) A survey course of the development of constitutional arrangement in Canada from the Royal Proclamation of 1763 until Confederation.

HIST 333 HISTORY OF NEW FRANCE: PART 1. (3) (Prerequisite: HIST 202 or consent of instructor) The development of the French Empire in North America, with particular emphasis on French-Native encounters arising through missions, trade, and military alliances.

HIST 334 HISTORY OF NEW FRANCE: PART 2. (3) (Prerequisite: HIST 202 or consent of instructor) Social and cultural history of France's ancien régime settlement colonies in North America. Topics include the links between the absolutist colonial state and society; family history; the Church, gender, and popular religion.

● **HIST 336 FRANCE, 1789 TO 1914.** (3) (Prerequisite: HIST 214 and HIST 215)

● **HIST 337 JAPANESE INTELLECTUAL HISTORY 1.** (3) (Not open to students who have taken 101-337D)

HIST 338 CHINA IN REVOLUTION 2: 1921-1997. (3) (Prerequisite: one previous course in Chinese or Asian history or permission of instructor) The history of China from the establishment of the Chinese Communist Party to the present. Contents: origins and development of the Chinese Communist movement; the War of Resistance against Japan; The People's Republic, the Cultural Revolution, Deng era reforms.

● **HIST 341 THE NEW NATION: U.S. 1800-1850.** (3) (Prerequisite: any course in U.S. history or consent of instructor)

HIST 342 CANADA: EXTERNAL RELATIONS SINCE 1867. (3) (Prerequisite: HIST 202 and HIST 203) This course will examine the historical development of Canadian external relations before WW II. Particular emphasis will be placed on Canadian-American relations, Canadian-Imperial relations, the growth of Canadian diplomatic autonomy and participation in the League of Nations.

HIST 343 WOMEN IN POST-CONFEDERATION CANADA. (3) (Prerequisite: HIST 203) This course examines women's contribution to the economic and social development of Canada as well as the changes in the image and status of women. Special emphasis will be on the relationship between women's roles in the private sphere and the public domain.

HIST 344 POLICE INSTITUTIONS. (3) (Prerequisite: One course in British, Canadian or American history) The origins of law enforcement from Saxon juries through Norman justices of the peace, to Scotland Yard and the London Metropolitan police. Focus on the Royal Irish Constabulary and its influence on the growth of rural police in Commonwealth countries.

HIST 345 HISTORY OF ITALIAN RENAISSANCE. (3) (Prerequisite: HIST 214 or consent of instructor) An introduction to the economy, society, politics and intellectual developments in Italy from approximately 1300 to the early 16th century.

● **HIST 346 FRANCE, 1914 TO THE PRESENT.** (3) (Prerequisite: HIST 214 and HIST 215 or written consent of instructor)

● **HIST 348 CHINA: SCIENCE-MEDICINE-TECHNOLOGY.** (3) (Prerequisite: HIST 208 or HIST 218 or permission of instructor)

HIST 349 HEALTH AND HEALER IN WESTERN HISTORY. (3) (Fall) (Also available to first-year medical students in their options program) The natural history of health and disease and the development of the healing arts, from antiquity to the beginning of modern times. The rise of "western" medicine. Health and healing as gradually evolving aspects of society and culture.

HIST 351 THEMES IN U.S. HISTORY SINCE 1865. (3) (Prerequisite: any course in U.S. history or consent of instructor) Aspects of American history from the gilded Age through the Cold War era.

● **HIST 352 JAPANESE INTELLECTUAL HISTORY 2.** (3) (Prerequisite: one previous course in East Asian history, including Japanese history and Chinese history, or permission of instructor) (Not open to students who have taken 101-337D)

HIST 355D1 GERMANY 1806-1918. (3) (Prerequisite: HIST 234 and HIST 235 or a European survey course or consent of the instructor)

(Students must also register for HIST 355D2) (No credit will be given for this course unless both HIST 355D1 and HIST 355D2 are successfully completed in consecutive terms) German political, constitutional and social history 1806 - 1918. Emphasis: Reform Era and Industrialisation; the evolution of Prussian hegemony; fin de siècle; imperialism; alliances and commitments; crises; the Great War.

HIST 355D2 GERMANY 1806-1918. (3) (Prerequisite: HIST 355D1) (No credit will be given for this course unless both HIST 355D1 and HIST 355D2 are successfully completed in consecutive terms) See HIST 355D1 for course description.

● **HIST 356 MEDIEVAL SCIENCE AND MEDICINE.** (3) (Prerequisite: HIST 380 or HIST 349 or permission of instructor)

HIST 357 RELIGION AND CANADIAN SOCIETY IN HISTORICAL PERSPECTIVE. (3) (Prerequisite: HIST 202 and HIST 203) (Not open to students who have taken 101-469) This course explores religious history of French and English Canada. The growth of various denominations, popular religion, Church/State relations, sectarian education, Protestant and Catholic cultures, missions among the Natives, forces of secularization. A reading knowledge of French is recommended.

● **HIST 358 MEDIEVAL TO EARLY MODERN CHINA.** (3) (Prerequisite: HIST 208 or permission of instructor) (Not open to students who have taken 101-308D)

HIST 359 HISTORY OF JAPAN 2. (3) (Not open to students who have taken 101-294B or 101-318D) A survey of Japanese history and culture from the 17th century to the present, this course aims to provide students with a broad understanding of important themes in Japanese Civilisation.

HIST 360 LATIN AMERICA SINCE 1825. (3) (Winter) Themes in the political, economic, and social development of Latin America since the wars of independence. Emphasis on the domestic history of the region, with some attention to relations with the United States and Europe.

HIST 361 THE CANADIAN WEST TO 1905. (3) (Prerequisite: HIST 202 and HIST 203) The development of what is now the Canadian West from the 17th century to the entry of Saskatchewan and Manitoba into confederation. Topics include: culture contact between native and European, the fur trade, entry of the West into confederation and its evolution from colonial to provincial status.

HIST 362 THE CANADIAN WEST SINCE 1905. (3) (Prerequisite: HIST 203 or consent of instructor) An examination of significant themes in the history of British Columbia and the Prairie Provinces since 1905. Topics include immigration, economic development, regional protest movements and class conflict within the West itself.

HIST 363 CANADA 1870-1914. (3) (Prerequisite: HIST 202 and HIST 203 or permission of instructor) This course will examine social, economic, political and cultural aspects of Canadian society between 1870 and 1914. Topics covered will include aboriginal peoples, European settlement of the West, provincial rights, the national policy, social reform movements, industrialization, immigration and the rise of cities.

HIST 364 CANADA 1914-1945. (3) (Prerequisite: HIST 202 and HIST 203 or permission of instructor) This course will examine Canada and Canadian society between 1914 and 1945. It will focus on the social, political, economic and cultural impact of the two World Wars and the economic crisis of the 1930s. Among the topics will be Canadian external relations, political and social protest, popular culture, demographic changes and prohibition.

HIST 365 17TH - 18TH C. WESTERN EUROPE. (3) (Prerequisite: HIST 214 or consent of instructor) (Not open to students who have taken 101-325D) A comparative analysis of the major states of Western Europe: Absolutism and its alternatives; religious and scientific thought; classical and enlightenment cultures; international and colonial rivalries. Special attention will be placed on social and economic changes between the 1630s and the late 18th century.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

● **HIST 366 HISTORY OF ROMAN LAW.** (3) (Prerequisite: HIST 209 or HIST 214 or 3 credits in law or politics, or permission of the instructor) (Not open to students who have taken 114-343)

HIST 367 CANADA SINCE 1945. (3) (Prerequisite: HIST 202, HIST 203) Elements of Canada's political, social, economic, and cultural history since World War II. Topics will include constitutional questions, gender and class issues, the role of the state, regionalism, consumer society, the Quiet Revolution, and nationalism in Canada.

● **HIST 368 GREEK HISTORY: CLASSICAL.** (3) (Prerequisite: HIST 205 or permission of instructor)

● **HIST 369 GREEK HISTORY: ARCHAIC.** (3) (Prerequisite: HIST 205 or HIST 214 or permission of instructor)

HIST 370 CANADA: 20TH CENTURY POLITICAL HISTORY. (3) (Prerequisite: HIST 203 or consent of the instructor) This course examines the history of politics and the state in 20th century Canada. Topics will include the early social reform, the emergence of the welfare state, and the increased presence of the state in post-war Canada.

HIST 371 RACE/ETHNICITY: U.S. SINCE 1800. (3) (Prerequisite: any course in U.S. history or consent of instructor) The influence of race and ethnicity on the United States during the 19th and 20th centuries. Topics will include: racism, segregation and disfranchisement; African American culture; immigration and nativism; Native Americans and Mexican Americans in the West; protest efforts and attempts to achieve a pluralistic society.

● **HIST 372 THE LOW COUNTRIES: 14TH - 17TH CENTURY.** (3) (Prerequisite: HIST 214 or consent of the instructor)

HIST 373 CANADIAN LABOUR HISTORY. (3) (Prerequisite: HIST 203 or equivalent or consent of instructor) (Not open to students who have taken HIST 353) This course explores themes in labour and working class history in Canada.

● **HIST 374 WEST AFRICA SINCE 1800.** (3) (Prerequisite: HIST 200 and HIST 201 or permission of instructor)

HIST 375 HISTORY OF THE EARLY ROMAN EMPIRE. (3) (Prerequisite: HIST 209 or HIST 214 or permission of instructor) Topics in the history of the Roman Empire from Augustus to Marcus Aurelius.

● **HIST 376 HISTORY OF THE LATER ROMAN EMPIRE.** (3) (Prerequisite: HIST 209 or HIST 214 or permission of instructor)

HIST 377 THE UNITED STATES, 1940-1965. (3) (Prerequisite: any course in U.S. history or consent of instructor) Major events in politics and international affairs, culture and society, and the economy in the U.S. during and after World War II. Topics include: The War and American society; the first years of the Cold War; economic prosperity and social change; the civil rights movement; Vietnam to 1965.

HIST 378 THE LATE ANTIQUE ROMAN WORLD. (3) (Prerequisite: HIST 209 or permission of instructor) A survey of the process by which the late Roman Empire divided into three chief cultural, religious, and political entities (Byzantine, Germanic and Islamic) between the fifth and eighth centuries.

● **HIST 379 CLASSICAL GREEK DEMOCRACY.** (3) (Prerequisite: HIST 205 or HIST 214 or any course in politics or permission of instructor)

HIST 380 WESTERN EUROPE: THE MIDDLE AGES. (3) (Not open to students who have taken 101-380D) History of Western Europe from the later Roman Empire through the 15th century: sub-roman and Carolingian civilization, feudal monarchy; the Church and the laity; domestic life and social institutions; cultural developments.

HIST 381 COLONIAL AFRICA: HEALTH/DISEASE. (3) (Prerequisite: HIST 200 and HIST 201 or HIST 349 or permission of the instructor) A study of the impact of disease on African societies over the last three centuries. Topics include: the efforts of Africans to control their ecology, and to maintain their own medical traditions; the wider African responses to Western bio-medicine, and the relationship of disease to nutrition, demography, and public health.

HIST 382 HISTORY OF SOUTH AFRICA. (3) (Prerequisite: HIST 200 and HIST 201) History of South Africa from precolonial times to the

present. Topics include: precolonial societies; British and Dutch colonialism; slavery in colonial South Africa; the Zulu kingdom; mining capitalism; the Boer War; Afrikaner nationalism; apartheid; the anti-apartheid struggle; music, religion, and art; challenges of the post-apartheid state.

● **HIST 383 BRITAIN 1688-1789: AGE OF REASON.** (3) (Pre-/Co-requisite: HIST 215 or HIST 204 or HIST 224 or permission of instructor)

HIST 384 BRITAIN 1789-1870. (3) (Pre-/Co-requisite: HIST 215 or HIST 224 or permission of instructor) (Not open to students who have taken 101-340 and 101-350) A social, economic, political and cultural survey of British history from the French Revolution to the 'High Victorian' years. Topics include: impact of war, evolution of the state, political ideologies, working class movements, industrialization, religious and social reform, gender relations and the family, leisure and culture, urbanisation, empire, and Ireland.

● **HIST 385 BRITAIN 1870-1935.** (3) (Pre-/Co-requisite: HIST 215 or HIST 224 or permission of instructor) (Not open to students who have taken 101-414)

HIST 386 BRITAIN SINCE 1935. (3) (Pre-/Co-requisite: HIST 215 or HIST 224 or permission of instructor) (Not open to students who have taken 101-424) A social, economic, political and cultural survey of British history from the eve of World War II. Topics include: road to war, appeasement, World War II, Labour in power, post-war political consensus, decolonisation, immigration, culture and society, Northern Ireland, Scottish and Welsh nationalism, Thatcherism, the European Union.

HIST 387 THE FIRST WORLD WAR. (3) A world-wide political, social, economic, cultural and military survey, from the origins of the Great War to the Treaty of Versailles.

HIST 388 THE SECOND WORLD WAR. (3) A world-wide political, social, economic, cultural and military survey, from the Treaty of Versailles to the first years of the Cold War.

● **HIST 389 RENAISSANCE AND REFORMATION FRANCE.** (3) (Prerequisite: HIST 214 or HIST 225 or permission of instructor) (Not open to students who have taken 101-425D)

HIST 390 FRANCE IN THE ANCIEN RÉGIME. (3) (Prerequisite: HIST 214 or HIST 225 or permission of instructor) (Not open to students who have taken 101-425D) The history of France from the end of the Thirty Year's War to the eve of the French Revolution. A reading knowledge of French is recommended.

HIST 391 HISTORY OF THE ROMAN REPUBLIC. (3) (Prerequisite: HIST 209 or HIST 214 or permission of instructor) (Not open to students who have taken 101-451) Topics in Roman Republican History, with emphasis on the period from the Gracchi to Augustus.

HIST 392 THE UNITED STATES SINCE 1965. (3) (Prerequisite: any course in U.S. history or consent of the instructor) Major events in politics and international affairs, culture and society, and economy in the U.S. since 1965. Topics include: social and political upheaval 1965 - 1975; Vietnam to 1975; conservative politics; Nixon and Watergate; economic change in the 1970s and 1980s; presidential leadership from Carter on.

HIST 393 CIVIL WAR AND RECONSTRUCTION. (3) (Prerequisite: any course in U.S. history or permission of instructor) (Not open to students who have taken 101-431) The causes of the American Civil War; the social, economic, political and military forces that shaped the conflict, attempts to restructure race relations, Southern and American societies after the war.

HIST 394 STUART BRITAIN AND IRELAND. (3) (Prerequisite: HIST 204 or HIST 214 or permission of instructor) A study of Britain and Ireland during the seventeenth and early eighteenth centuries; topics include the nature of early British society, the outbreak of the civil wars of the 1640s, the Restoration of the monarchy, and the changes in political ideas over the period.

HIST 395 CANADIAN MILITARY EXPERIENCE. (3) (Prerequisite: CANS 200 or HIST 203 or permission of instructor.) (Not open to students who have taken 106-406) Canada's military experience since European contact. The course explores social, economic,

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

technological and political themes as well as more traditional themes of military history.

HIST 396 DISEASE IN AFRICA SINCE 1960. (3) (Prerequisite: HIST 200 and HIST 201 or HIST 349 or permission of the instructor) This course examines the negatives and positives of African health since independence: the rise of new pathogens, especially HIV/AIDS, and the revitalization of old ones, such as drug resistant tuberculosis and malaria. Also examined are the growth of health infrastructure, and international successes such as the eradication of smallpox.

HIST 397 CANADA: ETHNICITY, MIGRATION. (3) (Prerequisite: HIST 202 and HIST 203 or permission of the instructor) (Not open to students who have taken HIST 423) Immigration, ethnicity and race in Canada in the nineteenth and twentieth centuries. Topics will include the migration process, government policy and legislation, urban and rural migration, acculturation, nativism and multiculturalism.

HIST 398 TOPICS IN ITALIAN HISTORY. (3) (Prerequisite: HIST 214) Topic for 2002-03: Italy in the Mediterranean 11th to 16th Centuries.

HIST 399 HISTORY AND HISTORICAL METHODS. (3) (Prerequisite: 6 credits of History) The nature and functions of history; changing conceptions of time and of the past; techniques historians use to find and appraise evidence; methods of reconstructing the past. Emphasis will be given not only to documentary sources but also to the range of techniques used by historians to find and appraise evidence.

HIST 401 TOPICS: MEDIEVAL CULTURE AND SOCIETY. (3) (Prerequisite: HIST 214 or HIST 380 or consent of instructor) Selected topics in the intellectual and cultural history of the Middle Ages. Emphasis on modern critical approaches to medieval culture, including literature, the supernatural, religious experience.

HIST 403 HISTORY OF QUEBEC INSTITUTIONS. (3) (Prerequisite: HIST 203 or consent of instructor) Analysis of institutional structures in Quebec with emphasis on the 19th century. Particular attention will be given to legal and property institutions in transition.

● **HIST 404 GREEK HISTORY: HELLENISTIC PERIOD.** (3) (Not open to students who have taken 114-401)

● **HIST 405 EUROPEAN CULTURAL HISTORY 1.** (3) (Prerequisite: HIST 214 and HIST 215, or a course in European intellectual history or consent of the instructor)

HIST 406 PETRINE AND CATHERINIAN RUSSIA. (3) (Prerequisite: A prior course in Russian or European history) The transformation of Russian society by Peter the Great and the problems and achievements of Russia's Golden Age under the enlightened despotism of Catherine II and of her son.

HIST 408 COLONIALISM AND NATIVE PEOPLES. (3) (Prerequisite: HIST 202) (Not open to students who have taken 101-580D) The nature and consequences of encounters between American native peoples and Europeans.

● **HIST 412 WOMEN AND GENDER IN MODERN BRITAIN.** (3) (Prerequisite: HIST 215 or a course in British history or permission of instructor)

HIST 413 INDEPENDENT READING. (3) (Prerequisite: Written permission) (Open to History Major Concentration students only. Students may register in this course only once) Exceptionally, and under the direction of a member of staff, advanced and highly qualified students who have an extensive background in the proposed area of study, may pursue this independent study.

● **HIST 415 EUROPEAN CULTURAL HISTORY 2.** (3) (Prerequisite: HIST 214 and HIST 215 or a course in European intellectual history or written consent of instructor)

HIST 417 THE CELTIC FRINGE. (3) (Prerequisite: At least one course in Modern British History) Social, economic, political and cultural topics in the modern history of Wales, Scotland and Ireland.

HIST 419 CENTRAL AMERICA. (3) (Prerequisite: HIST 309, HIST 360 or permission of instructor) (Not open to students who have taken 101-419D) The study of historical roots of the regional crisis

of the 1980s, with particular attention to Nicaragua, El Salvador and Guatemala.

HIST 421 TOPICS IN EARLY MODERN EUROPE. (3) (Prerequisite: a course in Early Modern Europe) Varying subjects of topical interest regarding early-modern Europe. Topic for 2002-03: Perspectives on Science: Imagery and Imagination.

● **HIST 422 ROMAN GREECE.** (3) (Prerequisite: 6 credits of Ancient Greek History or permission of instructor) (Not open to students who have taken 114-402)

● **HIST 423 TOPICS: MIGRATION AND ETHNICITY.** (3) (Prerequisite: HIST 397 or permission of instructor)

HIST 426 TOPICS: BRITISH CULTURAL HISTORY. (3) (Prerequisite: HIST 215 or a course in British history or permission of instructor) Selected topics in intellectual and cultural history of Britain and Ireland, focusing on discussion of primary texts. Topic for 2002-03: The history of sexuality in modern Britain (including some comparative examples), with a particular focus on gay and lesbian/queer history.

HIST 427 THE HASIDIC MOVEMENT. (3) (Prerequisite: HIST 307 or a course in East-European history or consent of instructor) A historical examination of the history of the Hasidic Movement from its beginnings in 18th-century Poland to the present. Although emphasis will be placed on the social history of the movement, doctrinal developments will be examined as well.

HIST 429 TOPICS: CANADIAN FAMILY HISTORY. (3) (Prerequisite: HIST 202 or HIST 203 or permission of instructor) This course will examine themes in the history of the Canadian family from 1850. Historical study reveals the family as a diverse, changing, social institution. Marriage, childhood, sexuality, and the state will come under examination and the Canadian experience will be compared to that of the U.S. Topic for 2002-03: Regulating Sexuality, Reproduction and the Family.

HIST 432 THE ATLANTIC PROVINCES. (3) (Prerequisite: HIST 202 and HIST 203 or consent of the instructor) Themes and topics in the history of the Canadian Atlantic Provinces from the European settlement to Present.

HIST 434 BRITISH NORTH AMERICA 1760-1867. (3) (Prerequisite: An introductory course in history or consent of instructor) This course will study the social-cultural and political development of British North American colonies.

HIST 435D1 GERMANY IN THE 20TH CENTURY. (3) (Prerequisite: HIST 234 and HIST 235 or a European survey course or consent of instructor) (Students must also register for HIST 435D2) (No credit will be given for this course unless both HIST 435D1 and HIST 435D2 are successfully completed in consecutive terms) First World War: national and international aspects; Weimar: economic crisis, and nationalism; rise of Hitler; structure of the National Socialist state; blue-print for World Power; Second World War; attempts to overthrow Hitler; the revolt of conscience; defeat; the Cold War and German unity; the post-War era.

HIST 435D2 GERMANY IN THE 20TH CENTURY. (3) (Prerequisite: HIST 435D1) (No credit will be given for this course unless both HIST 435D1 and HIST 435D2 are successfully completed in consecutive terms) See HIST 435D1 for course description.

HIST 436 TOPICS: EAST EUROPEAN HISTORY. (3) Topic for 2002-03: Historical Evidence and Methods.

● **HIST 437 FRENCH REVOLUTION HISTORIOGRAPHY.** (3) (Prerequisite: any history course covering Western European history from 1750 to 1815, or consent of the instructor)

● **HIST 439 HISTORY OF WOMEN IN CHINA.** (3) (Prerequisite: a previous course in Chinese history)

HIST 440 FICTION AND HISTORY. (3) (Prerequisite: 6 credits at the 300 level in either history or literature) This course examines why and how books are classified as fiction or history. Topics include: social expectations and uses of literature; evidence and verification; the author as authority. Readings include history and fiction from various historical periods, and relevant scholarship.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

HIST 441 TOPICS: CULTURE AND RITUAL IN CHINA. (3) (Prerequisite: HIST 208 and HIST 218 and permission of instructor) An examination of selected aspects of the cultural and intellectual life of China. Topics vary from year to year, but include the history of popular religion, Chinese science and medicine, the esoteric arts including divination practices, law, and the influence of ideas in the production of Chinese culture.

HIST 442 ASIAN DIASPORA: CHINESE OVERSEAS. (3) (Prerequisite: One previous course in Chinese or Asian history or permission of instructor) The contexts and causes of Chinese emigration; historical patterns of migration; Overseas Chinese communities on five continents, with emphasis on Southeast Asia and North America; alienation and identity in Chinatown; relations between the Overseas Chinese and China.

● **HIST 443 CHINA IN THE MODERN WORLD.** (3) (Prerequisite: HIST 328 or HIST 338 or permission of the instructor)

HIST 445 LATE IMPERIAL CHINA. (3) (Prerequisite: HIST 208 or HIST 218) An introduction to the social and economic history of Late Imperial China, focusing on the Ming and early to mid Qing Dynasties (1368 - 1800), and current interpretations thereof. Was this a discrete period in Chinese history? If so, why.

HIST 449 MEDICINE IN THE ANCIENT WORLD. (3) (Prerequisite: HIST 349 or an introductory course in Ancient Greek or Roman history) (Not open to students who have taken HIST 452 and HIST 453) The evolution of ideas about the human body, disease, and therapeutics, and the diverse practices of medicine in Graeco-Roman antiquity (ca 800BC - ca 600CE), with particular attention given to their social, political, cultural and religious context.

HIST 457 TOPICS IN MEDICAL HISTORY. (3) (Prerequisite: HIST 349 or HIST 356 or permission of instructor) This course explores different topics in medical history. Topics to be explored include the role of medicine from ancient to modern times.

HIST 458 MODERN MEDICINE: SEMINAR. (3) (Not open to students who have taken 101-459D) The emergence of scientific medicine, medical professionalization, the development of public health and the process of medical specialization since 1700.

HIST 459 MODERN MEDICINE: RESEARCH. (3) (Prerequisite: HIST 458) (Not open to students who have taken 101-459D) (Priority given to students in Honours History and students registered for the Minor in Social Studies of Medicine.) Supervised design, research, writing, and discussion of a major research paper on a theme in the history of modern medicine since 1700.

● **HIST 460 MILTON IN MYTH AND HISTORY.** (3) (Prerequisite: a 200-level course on modern English or European history or literature, or permission of instructor)

HIST 461D1 TOPICS IN MODERN U.S. HISTORY. (3) (Prerequisite: any course in American History or consent of instructor) (Students must also register for HIST 461D2) (No credit will be given for this course unless both HIST 461D1 and HIST 461D2 are successfully completed in consecutive terms)

HIST 461D2 TOPICS IN MODERN U.S. HISTORY. (3) (Prerequisite: HIST 461D1) (No credit will be given for this course unless both HIST 461D1 and HIST 461D2 are successfully completed in consecutive terms) See HIST 461D1 for course description.

● **HIST 462D1 TOPICS: CANADIAN CONSERVATISM.** (3) (Prerequisite: HIST 202 and HIST 203. Reading knowledge of French is required) (Students must also register for HIST 462D2)

● **HIST 462D2 TOPICS: CANADIAN CONSERVATISM.** (3) (Prerequisite: HIST 462D1)

● **HIST 463D1 TOPICS: HISTORY OF WOMEN IN CANADA.** (3) (Prerequisite: HIST 203 or consent of instructor) (Not open to students who have taken HIST 493) (Students must also register for HIST 463D2)

● **HIST 463D2 TOPICS: HISTORY OF WOMEN IN CANADA.** (3) (Prerequisite: HIST 463D1)

HIST 464D1 TOPICS: LATIN AMERICAN HISTORY. (3) (Prerequisite: HIST 309 or consent of instructor) (Not open to students who have taken 101-419D) (Students must also register for HIST 464D2) (No

credit will be given for this course unless both HIST 464D1 and HIST 464D2 are successfully completed in consecutive terms) This seminar counts as part of the North American concentration for Honours students.

HIST 464D2 TOPICS: LATIN AMERICAN HISTORY. (3) (Prerequisite: HIST 464D1) (No credit will be given for this course unless both HIST 464D1 and HIST 464D2 are successfully completed in consecutive terms) See HIST 464D1 for course description.

HIST 465D1 SEMINAR: ITALIAN RENAISSANCE. (3) (Prerequisite: HIST 214 or consent of instructor) (Students must also register for HIST 465D2) (No credit will be given for this course unless both HIST 465D1 and HIST 465D2 are successfully completed in consecutive terms)

HIST 465D2 SEMINAR: ITALIAN RENAISSANCE. (3) (Prerequisite: HIST 465D1) (No credit will be given for this course unless both HIST 465D1 and HIST 465D2 are successfully completed in consecutive terms) See HIST 465D1 for course description.

HIST 466 SEMINAR: MEDIEVAL MEDICINE (3) Models of the body, disease and medical intervention current in western Europe between 400 and 1500 AD will be examined through analysis of primary sources in translation, and modern historical scholarship. The sequel to this course is HIST 496.

● **HIST 468D1 TOPICS: 19TH CENTURY U.S. HISTORY.** (3) (Prerequisite: any course in U.S. history or permission of instructor) (Students must also register for HIST 468D2)

● **HIST 468D2 TOPICS: 19TH CENTURY U.S. HISTORY.** (3) (Prerequisite: HIST 468D1)

HIST 469D1 TOPICS IN CANADIAN RELIGIOUS HISTORY. (3) (Prerequisite: HIST 202 and HIST 203, plus HIST 357. A reading knowledge of French is highly recommended) (Students must also register for HIST 469D2) (No credit will be given for this course unless both HIST 469D1 and HIST 469D2 are successfully completed in consecutive terms)

HIST 469D2 TOPICS IN CANADIAN RELIGIOUS HISTORY. (3) (Prerequisite: HIST 469D1) (No credit will be given for this course unless both HIST 469D1 and HIST 469D2 are successfully completed in consecutive terms) See HIST 469D1 for course description.

HIST 470D1 TOPICS: HISTORICAL INTERPRETATION. (3) (Students must also register for HIST 470D2) (No credit will be given for this course unless both HIST 470D1 and HIST 470D2 are successfully completed in consecutive terms) Topic for 2002-03: Section 1 - Gender Theory and Medieval Women; Section 2 - History and Memory.

HIST 470D2 TOPICS: HISTORICAL INTERPRETATION. (3) (Prerequisite: HIST 470D1) (No credit will be given for this course unless both HIST 470D1 and HIST 470D2 are successfully completed in consecutive terms) See HIST 470D1 for course description.

HIST 476D1 SEMINAR: TOPICS IN RUSSIAN HISTORY. (3) (Students must also register for HIST 476D2) (No credit will be given for this course unless both HIST 476D1 and HIST 476D2 are successfully completed in consecutive terms) Topic for 2002-03: Perestroika and the collapse of the Soviet Union.

HIST 476D2 SEMINAR: TOPICS IN RUSSIAN HISTORY. (3) (Prerequisite: HIST 476D1) (No credit will be given for this course unless both HIST 476D1 and HIST 476D2 are successfully completed in consecutive terms) See HIST 476D1 for course description.

HIST 477D1 SEMINAR IN JEWISH HISTORY. (3) (Students must also register for HIST 477D2) (No credit will be given for this course unless both HIST 477D1 and HIST 477D2 are successfully completed in consecutive terms)

HIST 477D2 SEMINAR IN JEWISH HISTORY. (3) (Prerequisite: HIST 477D1) (No credit will be given for this course unless both HIST 477D1 and HIST 477D2 are successfully completed in consecutive terms) See HIST 477D1 for course description.

● **HIST 480D1 CAPITALISM AND EMPIRE: EUROPEAN DOMINATION.** (3) (Students must also register for HIST 480D2)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

- **HIST 480D2 CAPITALISM AND EMPIRE: EUROPEAN DOMINATION.** (3) (Prerequisite: HIST 480D1)
- HIST 481D1 TOPICS: U.S. COLONIAL ERA.** (3) (Students must also register for HIST 481D2) (No credit will be given for this course unless both HIST 481D1 and HIST 481D2 are successfully completed in consecutive terms)
- HIST 481D2 TOPICS: U.S. COLONIAL ERA.** (3) (Prerequisite: HIST 481D1) (No credit will be given for this course unless both HIST 481D1 and HIST 481D2 are successfully completed in consecutive terms) See HIST 481D1 for course description.
- **HIST 483D1 HISTORY OF MONTREAL.** (3) (Prerequisite: HIST 202 and HIST 203 and other courses on French Canada or consent of instructor) (Students must also register for HIST 483D2)
- **HIST 483D2 HISTORY OF MONTREAL.** (3) (Prerequisite: HIST 483D1)
- **HIST 484D1 TOPICS: MODERN BRITISH HISTORY.** (3) (Students must also register for HIST 484D2)
- **HIST 484D2 TOPICS: MODERN BRITISH HISTORY.** (3) (Prerequisite: HIST 484D1)
- HIST 485D1 SEMINAR IN JAPANESE HISTORY.** (3) (Prerequisite: HIST 208 or HIST 218 or consent of instructor) (Students must also register for HIST 485D2) (No credit will be given for this course unless both HIST 485D1 and HIST 485D2 are successfully completed in consecutive terms) Particular attention will be paid to Japanese responses to the impact of Western culture from the sixteenth century, and to aspects of Japanese intellectual history.
- HIST 485D2 SEMINAR IN JAPANESE HISTORY.** (3) (Prerequisite: HIST 485D1) (No credit will be given for this course unless both HIST 485D1 and HIST 485D2 are successfully completed in consecutive terms) See HIST 485D1 for course description.
- HIST 486D1 TOPICS: AFRICAN SOCIAL HISTORY.** (3) (Prerequisite: HIST 200 or consent of instructor) (Students must also register for HIST 486D2) (No credit will be given for this course unless both HIST 486D1 and HIST 486D2 are successfully completed in consecutive terms)
- HIST 486D2 TOPICS: AFRICAN SOCIAL HISTORY.** (3) (Prerequisite: HIST 486D1) (No credit will be given for this course unless both HIST 486D1 and HIST 486D2 are successfully completed in consecutive terms) See HIST 486D1 for course description.
- HIST 489D1 TOPICS: GERMANY.** (3) (Students must also register for HIST 489D2) (No credit will be given for this course unless both HIST 489D1 and HIST 489D2 are successfully completed in consecutive terms)
- HIST 489D2 TOPICS: GERMANY.** (3) (Prerequisite: HIST 489D1) (No credit will be given for this course unless both HIST 489D1 and HIST 489D2 are successfully completed in consecutive terms) See HIST 489D1 for course description.
- HIST 490D1 HONOURS TUTORIAL 1.** (3) (Students must also register for HIST 490D2) (No credit will be given for this course unless both HIST 490D1 and HIST 490D2 are successfully completed in consecutive terms)
- HIST 490D2 HONOURS TUTORIAL 1.** (3) (Prerequisite: HIST 490D1) (No credit will be given for this course unless both HIST 490D1 and HIST 490D2 are successfully completed in consecutive terms) See HIST 490D1 for course description.
- HIST 491D1 HONOURS TUTORIAL 2.** (3) (Students must also register for HIST 491D2) (No credit will be given for this course unless both HIST 491D1 and HIST 491D2 are successfully completed in consecutive terms) (HIST 491D1 and HIST 491D2 together are equivalent to HIST 491)
- HIST 491D2 HONOURS TUTORIAL 2.** (3) (Prerequisite: HIST 491D1) (No credit will be given for this course unless both HIST 491D1 and HIST 491D2 are successfully completed in consecutive terms) (HIST 491D1 and HIST 491D2 together are equivalent to HIST 491) See HIST 491D1 for course description.
- HIST 493D1 TOPICS: CANADIAN SOCIAL HISTORY.** (3) (Students must also register for HIST 493D2) (No credit will be given for this

course unless both HIST 493D1 and HIST 493D2 are successfully completed in consecutive terms)

HIST 493D2 TOPICS: CANADIAN SOCIAL HISTORY. (3) (Prerequisite: HIST 493D1) (No credit will be given for this course unless both HIST 493D1 and HIST 493D2 are successfully completed in consecutive terms) See HIST 493D1 for course description.

HIST 496 RESEARCH: MEDIEVAL MEDICINE. (3) (Open only to students who have taken HIST 466) Supervised design, research, writing, and discussion of a theme in the history of western European medicine, 400 - 1500 AD.

● **HIST 497D1 TOPICS IN CHINESE HISTORY.** (3) (Prerequisite: HIST 208 and HIST 218 and a 300-level course in Chinese History or permission of instructor) (Students must also register for HIST 497D2)

● **HIST 497D2 TOPICS IN CHINESE HISTORY.** (3) (Prerequisite: HIST 497D1)

● **HIST 498D1 SEMINAR IN EASTERN EUROPE.** (3) (Prerequisite: a course in European history or permission of instructor) (Students must also register for HIST 498D2)

● **HIST 498D2 SEMINAR IN EASTERN EUROPE.** (3) (Prerequisite: HIST 498D1)

HIST 550 ROMAN HISTORY: SEMINAR. (3) (Fall) (Prerequisite: HIST 209 or permission of instructor.) (Restricted to Honours students or advanced undergraduates who have permission of the instructor. Also open to graduate students.) Various topics in Roman history.

HIST 551 ROMAN HISTORY: RESEARCH. (3) (Winter) (Prerequisite: HIST 550) (Restricted to Honours students or advanced undergraduates who have permission of the instructor. Also open to graduate students.) In this research seminar students who have taken the Roman History Seminar (HIST 550), will undertake supervised design, research, discussion and writing of a research paper on a theme in Roman history.

● **HIST 579 THE ARTS OF HEALING IN CHINA.** (3) (Prerequisite: At least two courses at the 300-level or above in East Asian history or permission of instructor)

● **HIST 580D1 EUROPEAN AND NATIVE-AMERICAN ENCOUNTERS.** (3) (Prerequisite: permission of instructor.) (Priority is given to Graduate students)

● **HIST 580D2 EUROPEAN AND NATIVE-AMERICAN ENCOUNTERS.** (3) (Prerequisite: HIST 580D1)

HIST 581 THE ART OF WAR IN CHINA. (3) (Prerequisite: at least two 300-level or above courses in East Asian history, or permission of instructor) A study of the historical development of military theory and practice from earliest times to 1911 from a variety of perspectives, technological, scientific, social, and cultural.

HIST 582 EUROPEAN INTELLECTUAL HISTORY. (3) (Prerequisite: a previous course in European History or permission of instructor) A study of selected topics in 20th century French and European intellectual and cultural history and popular culture. Topic for 2003-04: Autobiographical and Collective memory, Europe and North America.

● **HIST 585 THEORY FOR HISTORICAL STUDIES.** (3) (Prerequisite: permission of instructor)

● **HIST 590 TOPICS: THE BRITISH EMPIRE.** (3) (Prerequisite: permission of instructor)

● **HIST 594D1 TOPICS: TUDOR AND STUART ENGLAND.** (3) (Prerequisite: any university course in British history or consent of instructor) (Students must also register for HIST 594D2)

● **HIST 594D2 TOPICS: TUDOR AND STUART ENGLAND.** (3) (Prerequisite: HIST 594D1)

● **HIST 595D1 SEMINAR: EARLY MODERN WESTERN EUROPE.** (3) (Prerequisite: permission of the instructor) (Students must also register for HIST 595D2)

● **HIST 595D2 SEMINAR: EARLY MODERN WESTERN EUROPE.** (3) (Prerequisite: HIST 595D1)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

HMST – Humanistic Studies

Offered by: Arts - Dean's Office
Former Teaching Unit Code: 131

HMST 296 WESTERN HUMANISTIC TRADITION 1. (3) (Restricted to students registering in Humanistic Studies.) (Not open to students who have taken HMST 200.) Implicit and explicit responses in selected texts (philosophical, literary, theological, historical) in the western tradition from 750 BCE to 1600 to the question, "What is it to be human?"

HMST 297 WESTERN HUMANISTIC TRADITION 2. (3) (Prerequisite: HMST 296.) (Restricted to students registering in Humanistic Studies.) (Not open to students who have taken HMST 200.) Implicit and explicit responses in selected texts (philosophical, literary, theological, historical) in the western tradition from 1600 to the present to the question, "What is it to be human?"

HPSC – Hist and Phil of Science

Offered by: Faculty of Arts
Former Teaching Unit Code: 146

HPSC 300 INDEPENDENT STUDIES: HISTORY AND PHILOSOPHY OF SCIENCE. (3) (Permission of Director and History & Philosophy of Science Committee) Offered by special arrangement between students in Arts or Science and a professor in either a Science or a Social Science Department. The purpose is to enable a student to undertake for credit the study of a special topic in the History or the Philosophy of Science.

HSEL – Health Science Electives

Offered by: School of Nursing
Former Teaching Unit Code: 576

HSEL 308 ISSUES IN WOMEN'S HEALTH. (3) (Fall) (Prerequisite: Introductory Psychology or Sociology or permission of the instructor) (Complementary course for the Women's Studies and Social Studies of Medicine Concentrations) Exploration of a wide range of topics on the health of women. Topics include use of health care system, poverty, roles, immigration, body image, lesbian health, and violence against women. Additional topics vary by year. A Health Science elective open to students in the Faculties of Arts, Science, and Medicine.

HSEL 309 WOMEN'S REPRODUCTIVE HEALTH. (3) (Winter) (Prerequisite: Introductory Psychology or Sociology or permission of the instructor) (Restriction: not open for credit to students who have taken HSEL 308 prior to September 1997) (Complementary course for the Women's Studies and Social Studies of Medicine Concentrations) Concepts of health and medicalization. Canadian and international perspectives. Topics include contraception, abortion, infertility, menstruation, menopause, new reproductive technologies, prenatal care, childbirth. Additional topics vary by year. A Health Science elective open to students in the Faculties of Arts, Science, and Medicine.

INTD – International Development

Offered by: Faculty of Arts
Former Teaching Unit Code: 152

INTD 490 DEVELOPMENT FIELD RESEARCH. (3) (Prerequisite: completion of ECON 313 and 3 credits of IDS Group A Complementary Courses) (Open only to students enrolled in International Development Studies Concentrations with prior approval of IDS program advisor and project supervisor) Supervised reading, field work and research project in international development. Requirements consist of previously approved project proposal, field component (usu-

ally carried out during the summer), and research report based on field work to be completed upon return.

INTD 491 RESEARCH PROJECT. (3) (Open only to U3 Joint Honours) Supervised reading and preparation of a research project under the direction of a member of staff.

INTD 492 HONOURS THESIS. (6) (Only open to U3 students in International Development Studies) (Permission of an appropriate supervising instructor and program adviser required) Supervised reading and preparation of a research report under the direction of a member of staff.

INTD 492D1 HONOURS THESIS. (3) (Students must also register for INTD 492D2) (No credit will be given for this course unless both INTD 492D1 and INTD 492D2 are successfully completed in consecutive terms) (INTD 492D1 and INTD 492D2 together are equivalent to INTD 492) Supervised reading and preparation of a research report under the direction of a member of staff.

INTD 492D2 HONOURS THESIS. (3) (Prerequisite: INTD 492D1) (No credit will be given for this course unless both INTD 492D1 and INTD 492D2 are successfully completed in consecutive terms) (INTD 492D1 and INTD 492D2 together are equivalent to INTD 492) See INTD 492D1 for course description.

May also be available as: INTD 492N1 and INTD 492N2

INTD 497 RESEARCH SEMINAR ON INTERNATIONAL DEVELOPMENT. (3) (Open only to students in final year of an IDS Concentration) An interdisciplinary research seminar on topics of common interest to staff and students of the International Development Studies programs. See <http://www.mcgill.ca/ids/courses/intd497>.

ISLA – Islamic Studies

Offered by: Institute of Islamic Studies
Former Teaching Unit Code: 397

Note: The following non-language courses are open only to U2 and U3 undergraduates and graduate students: ISLA 505, ISLA 506, ISLA 510D1/ISLA 510D2, ISLA 511D1/ISLA 511D2, and ISLA 531D1/ ISLA 531D2.

ISLA 410 HISTORY: MIDDLE-EAST 1798-1918. (3) (Fall) (3 hours) A study of the Middle East from Napoleon's invasion of Egypt to the end of WW I. Emphasis will be on the emergence of nationalisms in the context of European imperialism; political, social, and economic transformation; religion and ideology; and changing patterns of alliances.

● ★ **ISLA 411 HISTORY: MIDDLE-EAST 1918-1945.** (3) (Fall) (3 hours)

● **ISLA 501 THE QUR'AN: TEXT AND HISTORY.** (3)

ISLA 505 ISLAM: ORIGIN AND EARLY DEVELOPMENT. (3) (3 hours) The Qur'an, Hadith, the Shari'a and their major themes. The early development of law, theology and Sufism. The development and formation of an Islamic "orthodoxy", the development and nature of competing interpretations of Islam during the Classical Period. Topics: God, revelation, prophecy, the community and the individual and the meaning of history.

ISLA 506 ISLAM: LATER DEVELOPMENTS. (3) (3 hours) How the basic elements of Islam have been understood in the course of later Islamic history up to the present day. The nature and development of Shi'ism, Sufi brotherhoods, major intellectual trends, Islam in a world of nation states, diaspora. The challenges of modernity and the contemporary world.

★ **ISLA 510D1 HISTORY: ISLAMIC CIVILIZATION - CLASSICAL.** (3) (Fall) (3 hours) (Students must also register for ISLA 510D2) (No credit will be given for this course unless both ISLA 510D1 and ISLA 510D2 are successfully completed in consecutive terms) The origins of the early Islamic state in Arabia and the Umayyad Caliphate. The growth of an Islamic civilization, and the "Abbasid Empire" until the Seljuk period. The rise of the Fatimids. The Caliphate of Cordoba.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

★ **ISLA 510D2 HISTORY: ISLAMIC CIVILIZATION - CLASSICAL.** (3) (Winter) (Prerequisite: ISLA 510D1) (No credit will be given for this course unless both ISLA 510D1 and ISLA 510D2 are successfully completed in consecutive terms) See ISLA 510D1 for course description.

● ★ **ISLA 511D1 HISTORY: ISLAMIC CIVILIZATION - MEDIAEVAL ERA.** (3) (Fall) (3 hours) (Students must also register for ISLA 511D2)

● **ISLA 511D2 HISTORY: ISLAMIC CIVILIZATION - MEDIAEVAL ERA.** (3) (Winter) (Prerequisite: ISLA 511D1)

ISLA 521D1 INTRODUCTORY ARABIC. (4.5) (Fall) (5 lecture hours and laboratory) (Students must also register for ISLA 521D2) (No credit will be given for this course unless both ISLA 521D1 and ISLA 521D2 are successfully completed in consecutive terms) Modern Standard Literary Arabic (non-spoken).

ISLA 521D2 INTRODUCTORY ARABIC. (4.5) (Winter) (Prerequisite: ISLA 521D1) (No credit will be given for this course unless both ISLA 521D1 and ISLA 521D2 are successfully completed in consecutive terms) See ISLA 521D1 for course description.

● **ISLA 522 LOWER INTERMEDIATE ARABIC.** (6) (3 hours and laboratory) (Prerequisite: ISLA 521 or equivalent)

ISLA 522D1 LOWER INTERMEDIATE ARABIC. (3) (Fall) (3 hours and laboratory) (Prerequisite: ISLA 521 or equivalent) (Students must also register for ISLA 522D2) (No credit will be given for this course unless both ISLA 522D1 and ISLA 522D2 are successfully completed in consecutive terms) (ISLA 522D1 and ISLA 522D2 together are equivalent to ISLA 522)

ISLA 522D2 LOWER INTERMEDIATE ARABIC. (3) (Winter) (Prerequisite: ISLA 522D1) (No credit will be given for this course unless both ISLA 522D1 and ISLA 522D2 are successfully completed in consecutive terms) (ISLA 522D1 and ISLA 522D2 together are equivalent to ISLA 522) See ISLA 522D1 for course description.

ISLA 523D1 HIGHER INTERMEDIATE ARABIC. (3) (Fall) (3 hours) (Prerequisite: ISLA 522 or equivalent) (Formerly 397-623) (Students must also register for ISLA 523D2) (No credit will be given for this course unless both ISLA 523D1 and ISLA 523D2 are successfully completed in consecutive terms)

ISLA 523D2 HIGHER INTERMEDIATE ARABIC. (3) (Winter) (Prerequisite: ISLA 523D1) (No credit will be given for this course unless both ISLA 523D1 and ISLA 523D2 are successfully completed in consecutive terms) See ISLA 523D1 for course description.

ISLA 531D1 SURVEY DEVELOPMENT OF ISLAMIC THOUGHT. (3) (Fall) (3 hours) (Students must also register for ISLA 531D2) (No credit will be given for this course unless both ISLA 531D1 and ISLA 531D2 are successfully completed in consecutive terms) A survey of the development of the major intellectual traditions of Islamic civilization in medieval and modern times.

ISLA 531D2 SURVEY DEVELOPMENT OF ISLAMIC THOUGHT. (3) (Winter) (Prerequisite: ISLA 531D1) (No credit will be given for this course unless both ISLA 531D1 and ISLA 531D2 are successfully completed in consecutive terms) See ISLA 531D1 for course description.

ISLA 532D1 INTRODUCTORY TURKISH. (3) (Fall) (3 lecture hours plus conference and laboratory) (Students must also register for ISLA 532D2) (No credit will be given for this course unless both ISLA 532D1 and ISLA 532D2 are successfully completed in consecutive terms)

ISLA 532D2 INTRODUCTORY TURKISH. (3) (Winter) (Prerequisite: ISLA 532D1) (No credit will be given for this course unless both ISLA 532D1 and ISLA 532D2 are successfully completed in consecutive terms) See ISLA 532D1 for course description.

ISLA 533D1 LOWER INTERMEDIATE TURKISH. (3) (Fall) (3 lecture hours plus conference and laboratory) (Prerequisite: ISLA 532 or equivalent) (Students must also register for ISLA 533D2) (No credit will be given for this course unless both ISLA 533D1 and ISLA 533D2 are successfully completed in consecutive terms)

ISLA 533D2 LOWER INTERMEDIATE TURKISH. (3) (Winter) (Prerequisite: ISLA 533D1) (No credit will be given for this course unless

both ISLA 533D1 and ISLA 533D2 are successfully completed in consecutive terms) See ISLA 533D1 for course description.

ISLA 541D1 INTRODUCTORY PERSIAN. (3) (Fall) (3 hours) (Students must also register for ISLA 541D2) (No credit will be given for this course unless both ISLA 541D1 and ISLA 541D2 are successfully completed in consecutive terms)

ISLA 541D2 INTRODUCTORY PERSIAN. (3) (Winter) (Prerequisite: ISLA 541D1) (No credit will be given for this course unless both ISLA 541D1 and ISLA 541D2 are successfully completed in consecutive terms) See ISLA 541D1 for course description.

ISLA 542D1 LOWER INTERMEDIATE PERSIAN. (3) (Fall) (3 hours) (Prerequisite: ISLA 541 or equivalent) (Students must also register for ISLA 542D2) (No credit will be given for this course unless both ISLA 542D1 and ISLA 542D2 are successfully completed in consecutive terms)

ISLA 542D2 LOWER INTERMEDIATE PERSIAN. (3) (Winter) (Prerequisite: ISLA 542D1) (No credit will be given for this course unless both ISLA 542D1 and ISLA 542D2 are successfully completed in consecutive terms) See ISLA 542D1 for course description.

ISLA 551D1 INTRODUCTORY URDU. (3) (Fall) (3 hours) (Students must also register for ISLA 551D2) (No credit will be given for this course unless both ISLA 551D1 and ISLA 551D2 are successfully completed in consecutive terms) Introduction to the basic grammatical structures and vocabulary of the Urdu language, including drills in pronunciation and sentence structures.

ISLA 551D2 INTRODUCTORY URDU. (3) (Winter) (Prerequisite: ISLA 551D1) (No credit will be given for this course unless both ISLA 551D1 and ISLA 551D2 are successfully completed in consecutive terms) See ISLA 551D1 for course description.

ISLA 552D1 INTERMEDIATE URDU. (3) (Fall) (3 hours) (Prerequisite: ISLA 551 or equivalent) (Students must also register for ISLA 552D2) (No credit will be given for this course unless both ISLA 552D1 and ISLA 552D2 are successfully completed in consecutive terms) Assuming a knowledge of basic grammar and vocabulary, this course continues with the study of more complex grammatical structures. Reading and composition exercises in Urdu script are designed to give intermediate competency in the language.

ISLA 552D2 INTERMEDIATE URDU. (3) (Winter) (Prerequisite: ISLA 552D1) (No credit will be given for this course unless both ISLA 552D1 and ISLA 552D2 are successfully completed in consecutive terms) See ISLA 552D1 for course description.

ITAL – Italian (Arts)

Offered by: Department of Italian Studies

Former Teaching Unit Code: 132

Courses taught in English are clearly indicated. For courses taught in Italian, students must have completed at least ITAL 215D1/ ITAL 215D2 or ITAL 216 (Intermediate Italian), Intermediate Italian in CEGEP or have equivalent knowledge. It is highly recommended that students complete at least one Intermediate Level I course before proceeding to Intermediate Level II and Advanced Level I. Advisers are available to help with the choice of courses.

Unless otherwise specified, all courses are given in Italian.

● **ITAL 199 FYS: ITALY'S LITERATURE IN CONTEXT.** (3) (Fall or Winter) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) (Given in English)

ITAL 205D1 ITALIAN FOR BEGINNERS. (3) (Fall) (3 hours and laboratory) (Students must also register for ITAL 205D2) (No credit will be given for this course unless both ITAL 205D1 and ITAL 205D2 are successfully completed in consecutive terms) Grammar, reading, dictation. Intensive practice in speech patterns and written structures. Conversation and composition. Visual material and selected readings will be used in describing the making of contemporary Italy.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ITAL 205D2 ITALIAN FOR BEGINNERS. (3) (Winter) (Prerequisite: ITAL 205D1) (No credit will be given for this course unless both ITAL 205D1 and ITAL 205D2 are successfully completed in consecutive terms) See ITAL 205D1 for course description.

ITAL 206 BEGINNERS' ITALIAN INTENSIVE. (6) (Fall or Winter) (6 hours and 1 hour laboratory) (Not open to students who have taken ITAL 205D1/ITAL 205D2) Designed to cover in one term the same material as ITAL 205D1/ITAL 205D2. The Summer term will also be given in Florence, Italy, as part of McGill's Summer courses in Italy program.

ITAL 210D1 ELEMENTARY ITALIAN. (3) (Fall) (3 hours and laboratory) (Prerequisite: permission of the Department) (Not open to students who have taken ITAL 205D1/ITAL 205D2 or ITAL 206) (Students must also register for ITAL 210D2) (No credit will be given for this course unless both ITAL 210D1 and ITAL 210D2 are successfully completed in consecutive terms) The course is intended for students who have never studied Italian but who have had some informal exposure to the language. Grammar, reading, conversation and composition. An outline of Italian civilization, oral presentations and discussions.

ITAL 210D2 ELEMENTARY ITALIAN. (3) (Winter) (Prerequisite: ITAL 210D1) (No credit will be given for this course unless both ITAL 210D1 and ITAL 210D2 are successfully completed in consecutive terms) See ITAL 210D1 for course description.

ITAL 215D1 INTERMEDIATE ITALIAN. (3) (Fall) (Students must also register for ITAL 215D2) (No credit will be given for this course unless both ITAL 215D1 and ITAL 215D2 are successfully completed in consecutive terms) Direct continuation of ITAL 205D1/ITAL 205D2. Grammar, literary readings, conversation. Grammar exercises and composition. Reading of selected literary works, oral presentations and group discussion.

ITAL 215D2 INTERMEDIATE ITALIAN. (3) (Winter) (Prerequisite: ITAL 215D1) (No credit will be given for this course unless both ITAL 215D1 and ITAL 215D2 are successfully completed in consecutive terms) See ITAL 215D1 for course description.

ITAL 216 INTERMEDIATE ITALIAN INTENSIVE. (6) (Fall or Winter) (6 hours) (Prerequisite: ITAL 205D1/ITAL 205D2 or ITAL 206 or permission of the Department) (Not open to students who have taken ITAL 210) Course designed to cover in one term the same material as ITAL 215D1/ITAL 215D2. Direct continuation of ITAL 206. The Summer term will also be given in Florence, Italy, as part of McGill's Summer courses in Italy program.

ITAL 300 ITALIAN LITERARY COMPOSITION. (3) (3 hours seminar) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) (Restriction: Not open to students who have taken ITAL 306.) Analysis and discussion of selected 19th and 20th century literary texts with a view to improving language and composition skills. Review of major grammatical difficulties.

● **ITAL 306 ADVANCED READING AND COMPOSITION.** (6) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) (Restriction: Not open to students who have taken ITAL 300.)

● **ITAL 307 TOPICS IN ITALIAN CULTURE.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2 or ITAL 216, or equivalent)

● **ITAL 308 BUSINESS ITALIAN 1.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2 or ITAL 216 or equivalent)

● **ITAL 309 PERSPECTIVES ON ITALY.** (3)

ITAL 311 TWENTIETH CENTURY TEXTS. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) A selection of narrative and theatrical works by 20th century authors, illustrating different facets of this century's social and literary experience.

ITAL 320 MANZONI: NOVEL AND NATIONHOOD. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) An analysis of the historical novel "I promessi sposi", by Alessandro Manzoni: its political, social and intellectual role in the evolution of Italy towards nationhood (Risorgimento).

ITAL 325 MASTERPIECES OF ITALIAN LITERATURE 1. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216 or equivalent.) A survey of

Italian literature focused on the Middle Ages and the Renaissance. Interdisciplinary approach.

ITAL 326 MASTERPIECES OF ITALIAN LITERATURE 2. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) A survey of Italian literature from Renaissance to the 20th century. Interdisciplinary approach.

ITAL 330 COMMEDIA DELL'ARTE. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) Playhouses, actors, stage techniques, masks and scenarios of the "Commedia dell'arte".

ITAL 341 THE ART OF ESSAY WRITING. (3) (Prerequisites: ITAL 300 or permission of the Department) Word formation in the Italian language. Syntactic and stylistic aspects of texts by Italian essayists.

ITAL 355 DANTE AND THE MIDDLE AGES. (3) (Given in English) An introduction to the work of Dante Alighieri, a pillar of medieval European literature. The times in which he lived, the institutions and cultural shifts of that era, the influence exercised by Dante's work, as well as how it has been perceived in our time.

● **ITAL 356 MEDIEVAL DISCOURSES ON LOVE.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent)

● **ITAL 360 CONTEMPORARY ITALIAN PROSE.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent)

ITAL 361 ITALIAN PROSE AFTER 1945. (3) (Given in English) (Topic for 2003-04: Post-Modern Italian Literature.) Major prose works of Italian literature as they reflect the reactions of writers to the social, cultural and political dilemmas facing Italian society in the second half of the 20th century.

ITAL 363 GENDER, LITERATURE AND SOCIETY. (3) (Given in English) (Course for the Women's Studies Concentrations) Questions of gender identity and literary representation as they emerge from women's texts or from comparisons of women's and men's texts, in relation to specific social and historical conditions. May focus on any time period in Italian history, from medieval to contemporary.

ITAL 365 THE ITALIAN RENAISSANCE. (3) (Given in English) A presentation of the main ideas and literary masterpieces of the Italian Renaissance (13th-17thC), in the context of Italy's social, political, religious and cultural climate. Reading and discussion of selected literary texts and visual material.

● **ITAL 368 LITERATURE OF THE RENAISSANCE.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent)

ITAL 370 ITALIAN POETRY AND MUSIC. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) A study of the texts of Italian madrigals, canzoni, mottetti and librettos in relation to their musical setting from the Renaissance to the 19th century. Emphasis on the transformation of literary texts for their adaptation to music, and on the language of Italian Opera. No specialized knowledge of music is required.

ITAL 375 CINEMA AND SOCIETY IN MODERN ITALY. (3) (Given in English) A survey of the most important trends in post-war Italian cinema seen in the context of the rapidly and dramatically evolving society of modern Italy.

● **ITAL 376 MEDIEVAL ROMANCE IN ITALY.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent)

ITAL 380 VERGA: THE ILLUSION OF REALITY. (3) (Prerequisite: ITAL 215D1/ITAL 215D2) The realist movement in Italian narrative prose (1880-1910) with particular focus on its definition and representation of reality. Emphasis will be placed on the novels and short stories of Giovanni Verga, the main representative of the movement.

● **ITAL 383 WOMEN'S WRITING SINCE 1880.** (3) (Prerequisite: any 300 level course given in Italian or permission of the Department) (Course for the Women's Studies Concentrations)

● **ITAL 385 ITALIAN FUTURIST MOVEMENT.** (3) (Given in English)

ITAL 395 INTERDISCIPLINARY SEMINAR. (3)

ITAL 410 MODERN ITALIAN LITERATURE. (3) A study of representative works of major Italian authors from the fin-de-siècle to WW II.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ITAL 411 PIRANDELLO. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) Selected readings from Pirandello's essays, short stories, novels and plays in the light of his ideological rejection of the literature and society of his time.

- **ITAL 415 ITALIAN POETRY 20TH CENTURY.** (3) (Prerequisite: permission of the Department)
- **ITAL 416 THE TWENTIETH CENTURY.** (3) (Given in English.)
- **ITAL 420 LEOPARDI AND ITALIAN ROMANTICISM.** (3) (Prerequisite: ITAL 215, ITAL 216, or equivalent)
- **ITAL 435 ARIOSTO'S ORLANDO FURIOSO.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent)
- **ITAL 436 TASSO'S GERUSALEMME LIBERATA.** (3) (Winter) (Prerequisite: ITAL 215D1/ITAL 215D2)

ITAL 444 INDIVIDUAL READING COURSE. (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent) In exceptional circumstances, this course may be used to meet special interests of students or to assist them in meeting the standard requirements of the Department.

- **ITAL 461 DANTE: THE DIVINE COMEDY.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent)
- **ITAL 464 MACHIAVELLI.** (3) (Given in English)

ITAL 470 HONOURS THESIS. (3) (Compulsory for Honours and Joint Honours students)

ITAL 477 ITALIAN CINEMA AND VIDEO. (3) (Not open to students who have taken ITAL 377.) (Topic for 2003-04: Bernardo Bertolucci.) Different Italian film maker or videomaker every year, presenting a selection of his/her significant works. Discussions will include script analysis, interviews, articles and books by the director in focus, in addition to theoretical and critical statements by scholars. Established and new directors will be considered alternately.

- **ITAL 530 17TH-18TH CENTURY CULTURE.** (3)

ITAL 542 HISTORY OF ITALIAN LANGUAGE. (3) (Prerequisite: permission of the Department) A historical survey of the intense debate on the problem of literary language in Italy, from Dante to the present time, as caused by the variance between spoken and literary languages; followed by an in-depth examination of the theoretical and literary texts of one particular period.

- **ITAL 551 BOCCACCIO AND THE ITALIAN NOVELLA.** (3) (Prerequisite: ITAL 215D1/ITAL 215D2, ITAL 216, or equivalent)

ITAL 563 13TH-16TH CENTURY LITERATURE. (3) (Prerequisite: permission of the Department) Topics in the literature of the 13th to the 16th Centuries.

- **ITAL 590 ITALIAN LITERARY CRITICISM.** (3) (Prerequisite: permission of the Department.)

JWST – Jewish Studies

Offered by: Department of Jewish Studies
Former Teaching Unit Code: 135

Advanced courses have language and subject prerequisites. U0 and U1 students and students not taking a program in Jewish Studies should consult the professor before registering for any course above 399.

JWST 199 FYS: IMAGES - JEWISH IDENTITIES. (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum enrolment 25) A seminar devoted to literary portrayals of Jews by Jews and non-Jews from Biblical times to the present. Both positive and negative understandings of Jewish identity and Judaism will be studied.

JWST 200 HEBREW LANGUAGE (INTENSIVE). (12) (Not open to students who have taken or are taking JWST 220 or JWST 320) (Normally offered in the summer) Intensive language course, covering the first two levels in one year rather than the usual two.

JWST 201 JEWISH LAW. (3) The nature and history of Jewish law; literary and legal sources; selections in English from the Mishnah and Talmud, as well as selected post-Talmudic Texts, on such subjects as Contracts, Torts, Public Law and Family Law.

- **JWST 206 INTRODUCTION TO YIDDISH LITERATURE.** (3) (Readings are in English)

JWST 211 JEWISH STUDIES 1: BIBLICAL PERIOD. (3) (All texts will be read in English) The history, literature and beliefs of Judaism's formative period. Both Biblical and non-Biblical materials will be studied. The Bible in the context of cognate literatures of the Ancient Near East; non-Biblical documents will be analysed for their bearing on the Jewish tradition.

JWST 216 JEWISH STUDIES 2: 400 BCE - 1000. (3) (All texts and discussions will be in English) The history, literature and intellectual developments in Judaism during late antiquity. Special emphasis will be placed on rabbinic literature e.g. Babylonian Talmud, Palestinian Talmud, the midrashim both as literary works and for the light they shed on the events and ideologies of the period.

- **JWST 217 JEWISH STUDIES 3: 1000 TO 2000.** (3) (All texts will be read in English)

JWST 220D1 INTRODUCTORY HEBREW. (3) (Students must also register for JWST 220D2) (No credit will be given for this course unless both JWST 220D1 and JWST 220D2 are successfully completed in consecutive terms)

JWST 220D2 INTRODUCTORY HEBREW. (3) (Prerequisite: JWST 220D1) (No credit will be given for this course unless both JWST 220D1 and JWST 220D2 are successfully completed in consecutive terms) See JWST 220D1 for course description.

- **JWST 225 LITERATURE AND SOCIETY.** (3) (All texts will be read in English)

- **JWST 240 THE HOLOCAUST.** (3) (Not open to students who have taken JWST 252 "The Holocaust")

- **JWST 252 INTERDISCIPLINARY LECTURES.** (3)

- **JWST 254 THE JEWISH HOLY DAYS.** (3)

JWST 261 HISTORY OF JEWISH PHILOSOPHY & THOUGHT. (3) An introduction to Jewish philosophy and thought from the Hellenic period (Philo) to the beginning of the modern era (Spinoza) focusing on topics such as prophecy and philosophy, God and the world; the Law as a canon of ethical rules and as a political constitution. survey the treatment of such issues by Jewish thinkers from Philo to Maimonides.

- **JWST 280 INTRODUCTORY YIDDISH.** (6) (Summer)

JWST 280D1 INTRODUCTORY YIDDISH. (3) (Students must also register for JWST 280D2) (No credit will be given for this course unless both JWST 280D1 and JWST 280D2 are successfully completed in consecutive terms) (JWST 280D1 and JWST 280D2 together are equivalent to JWST 280) Introduction to basic structures of standard Yiddish. Intensive practice in speech and written structures. Emphasis on grammar, reading and writing. Selected readings to introduce Yiddish culture.

JWST 280D2 INTRODUCTORY YIDDISH. (3) (Prerequisite: JWST 280D1) (No credit will be given for this course unless both JWST 280D1 and JWST 280D2 are successfully completed in consecutive terms) (JWST 280D1 and JWST 280D2 together are equivalent to JWST 280) See JWST 280D1 for course description.

- **JWST 300 CHARISMA AND SOCIAL CHANGE.** (3)
- **JWST 301 HEBREW EMPIRE AND CRISIS.** (3) (All texts will be read in English)
- **JWST 303 THE SOVIET JEWISH EXPERIENCE.** (3) (Readings in English)

JWST 305 AMERICAN JEWISH HISTORY / COLONIAL ERA TO WWI. (3) The interaction of Jewish and American historical traditions in forging the American Jewish experience. The themes of acculturation, immigration and political behaviour will be treated.

JWST 306 THE AMERICAN JEWISH COMMUNITY. (3) Issues affecting American Jewry in the post-World War I era until today and the American Jewish community's responses to those issues. Special

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

emphasis on understanding the community responses and reactions to developments in both the American society and in the Jewish world.

● **JWST 309 JEWS IN FILM.** (3)

● **JWST 310 BELIEVERS, HERETICS AND CRITICS.** (3)

JWST 314 DENOMINATIONS IN NORTH AMERICAN JUDAISM. (3) A survey of Reform, Reconstructionist, Conservative and Orthodox Judaism in North America. Emphasis is placed on the ideology forwarded by the movements since their inception.

JWST 315 MODERN LIBERAL JEWISH THOUGHT. (3) The work of Mordecai Kaplan, followed by a study of several contemporary authors following feminist, mystical and postmodernist tendencies.

● **JWST 316 SOCIAL AND ETHICAL ISSUES IN JEWISH LAW 1.** (3)

JWST 320D1 INTERMEDIATE HEBREW. (3) (Students must also register for JWST 320D2) (No credit will be given for this course unless both JWST 320D1 and JWST 320D2 are successfully completed in consecutive terms) (JWST 320D1 and JWST 320D2 together are equivalent to JWST 320)

JWST 320D2 INTERMEDIATE HEBREW. (3) (Prerequisite: JWST 320D1) (No credit will be given for this course unless both JWST 320D1 and JWST 320D2 are successfully completed in consecutive terms) (JWST 320D1 and JWST 320D2 together are equivalent to JWST 320) See JWST 320D1 for course description.

JWST 325 ISRAELI LITERATURE IN TRANSLATION. (3) Selected topics in contemporary Israeli literature. Topic for 2002-03: Israeli Novel in Dialogue.

JWST 327 A BOOK OF THE BIBLE. (3) (Fall) (Prerequisite: Knowledge of Hebrew) (Topic in 2003-04: Genesis) One book of the Bible will be studied in its entirety in Hebrew. Emphasis on the contributions of Ancient Near Eastern Studies (archaeology, comparative literature and Semitic linguistics) to understanding the text.

JWST 328 A BOOK OF THE BIBLE. (3) (Winter) (Prerequisite: Knowledge of Hebrew) (Topic in 2003-04: Samuel) One book of the Bible will be studied in its entirety in Hebrew. Emphasis on the contributions of Ancient Near Eastern Studies (archaeology, comparative literature and Semitic linguistics) to understanding the text. Topic in 2001-02: TBA.

JWST 329 A BOOK OF THE BIBLE. (3) (Fall) (Prerequisite: Knowledge of Hebrew) One book of the Bible will be studied in its entirety in Hebrew. Emphasis on the contributions of Ancient Near Eastern Studies (archaeology, comparative literature and Semitic linguistics) to understanding the text. Topic in 2002-03: Esther.

● **JWST 330 A BOOK OF THE BIBLE.** (3) (Winter) (Prerequisite: Knowledge of Hebrew)

JWST 331 BIBLE INTERPRETATION/MEDIEVAL ASHKENAZ. (3) (Prerequisite: Knowledge of Hebrew) An introduction to Jewish interpretation of the Bible in the Middle Ages. Readings from the Hebrew Bible and the commentaries of Rashi, Rashbam, the Tosafists, etc.

JWST 332 BIBLE INTERPRETATION/SEFARDIC TRADITION. (3) (Prerequisite: Knowledge of Hebrew. Recommended: JWST 331) Readings from the Hebrew Bible and the commentaries of Ibn Ezra, Nachmanides, Abravanel, etc.

● **JWST 333 THE HEBREW LITURGY.** (3) (Prerequisite: Reading knowledge of Hebrew)

JWST 337 JEWISH PHILOSOPHY AND THOUGHT 1. (3) (Fall) Focuses on either a period, a current of thought or the work of a thinker in the history of Jewish thought from Antiquity to the Middle Ages, paying particular attention to the relationship of Jewish thinkers to intellectual trends in their respective cultural contexts. contemporary Muslim and Christian theologians and philosophers.

JWST 338 JEWISH PHILOSOPHY AND THOUGHT 2. (3) (Winter) (Topic for 2003: The God of Aristotle and the God of the Bible in medieval Jewish and Christian philosophy: Moses Maimonides and Thomas Aquinas. Course offered jointly by the Dept. of Jewish Studies and the Faculty of Religious Studies.) Focuses on either a period, a current of thought or the work of a thinker in the history of

Jewish thought from the Middle Ages to Modern Times, paying particular attention to the relationship of Jewish thinkers to intellectual trends in their respective cultural contexts. themes and concerns of Jewish theology and on Jewish responses to contemporary trends in European thought.

JWST 340D1 ADVANCED HEBREW. (3) (Prerequisite: JWST 200 or JWST 320 or permission of the Hebrew Language Coordinator) (Students must also register for JWST 340D2) (No credit will be given for this course unless both JWST 340D1 and JWST 340D2 are successfully completed in consecutive terms)

JWST 340D2 ADVANCED HEBREW. (3) (Prerequisite: JWST 340D1) (No credit will be given for this course unless both JWST 340D1 and JWST 340D2 are successfully completed in consecutive terms) See JWST 340D1 for course description.

JWST 345 INTRODUCTION TO RABBINIC LITERATURE. (3) (All readings in English) An introduction to the study of Rabbinic texts. Topic for 2002-03: TBA.

● **JWST 346 MODERN JEWISH STUDIES.** (3) (Requires Departmental approval)

● **JWST 347 MODERN JEWISH STUDIES.** (3) (Requires Departmental approval)

JWST 348 MODERN JEWISH STUDIES. (3) Topics in Jewish Studies. Semesters will be devoted to specific issues and periods of the Jewish Experience since 1500 and the literature produced by Jews during this period. Topic for 2003-04: Jews in Film and Literature(1900-1950).

JWST 349 MODERN JEWISH STUDIES. (3) Topics in Jewish Studies. Semesters will be devoted to specific issues and periods of the Jewish Experience since 1500 and the literature produced by Jews during this period. Topic for 2003-04: Jewish Christian Relations in Modern Times.

JWST 351 STUDIES IN MODERN JEWISH LITERATURE. (3) (All texts will be read in English) Topic for 2002-03: Jewish women's writing. How sexual difference contributed to the shape and subject of specific literary works in their social and historical contexts. Issues discussed will include masculine and feminine character, and the competing realms of family and world.

● **JWST 355 THE YIDDISH CANON.** (3) (Prerequisite: Any literature course)

● **JWST 356 JEWISH LABOUR MOVEMENT/EASTERN EUROPE.** (3)

● **JWST 357 JEWISH LABOUR MOVEMENT/NORTH AMERICA.** (3)

● **JWST 358 TOPICS IN JEWISH PHILOSOPHY 1.** (3)

● **JWST 359 TOPICS IN JEWISH PHILOSOPHY 2.** (3)

● **JWST 361 THE SHTETL: 1500-1897.** (3)

● **JWST 362 THE SHTETL: 1897-1939.** (3) (Recommended: JWST 361)

● **JWST 365 MODERN JEWISH IDEOLOGIES.** (3)

● **JWST 366 HISTORY OF ZIONISM.** (3) (Recommended: JWST 365)

JWST 367 STUDIES IN HEBREW LANGUAGE AND LITERATURE. (3) (Fall) To expand knowledge of grammar, and vocabulary and idioms in order to enhance reading comprehension and facility in writing and speaking. Of value to those interested in all aspects of Hebrew literature, classical and modern.

JWST 368 STUDIES IN HEBREW LANGUAGE AND LITERATURE. (3) (Winter) To expand knowledge of grammar, and vocabulary and idioms in order to enhance reading comprehension and facility in writing and speaking. Of value to those interested in all aspects of Hebrew literature, classical and modern.

● **JWST 369 STUDIES IN HEBREW LANGUAGE AND LITERATURE.** (3) (Fall)

● **JWST 370 STUDIES IN HEBREW LANGUAGE AND LITERATURE.** (3) (Winter)

JWST 371D1 JEWS AND THE MODERN CITY. (3) (Students must also register for JWST 371D2) (No credit will be given for this course unless both JWST 371D1 and JWST 371D2 are success-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

fully completed in consecutive terms) In the forefront of the development of modern society in Europe and North America, the Jews have shown a distinct preference for the metropolis. The influence of Vienna and New York on the socio-cultural development of the Jews and on the Jewish contribution to general culture. The contributions of Schnitzler, Freud, Herzl and the New York intellectuals.

JWST 371D2 JEWS AND THE MODERN CITY. (3) (Prerequisite: JWST 371D1) (No credit will be given for this course unless both JWST 371D1 and JWST 371D2 are successfully completed in consecutive terms) See JWST 371D1 for course description.

- **JWST 374 TALMUD AND LAW 1: BAVA KAMMA.** (3)
- **JWST 375 TALMUD AND LAW 2: BAVA METZIA.** (3)

JWST 380D1 INTERMEDIATE YIDDISH. (3) (Prerequisite: JWST 280 or permission of instructor) (Students must also register for JWST 380D2) (No credit will be given for this course unless both JWST 380D1 and JWST 380D2 are successfully completed in consecutive terms) Intermediate level of study of structures of standard Yiddish. Emphasis on reading, composition and conversation. Selected readings and visual materials to expand knowledge of Yiddish culture.

JWST 380D2 INTERMEDIATE YIDDISH. (3) (Prerequisite: JWST 380D1) (No credit will be given for this course unless both JWST 380D1 and JWST 380D2 are successfully completed in consecutive terms) See JWST 380D1 for course description.

JWST 383 HOLOCAUST LITERATURE. (3) (Not open to students who have taken this topic under JWST 381) Topic for 2003-2004: Foreshadowings: An introduction to prose fiction and poetry written prior to the Holocaust which in some ways anticipate it, particularly in the depiction of racial hatred. Writers who will be studied include: Joseph Conrad, Franz Werfel, Lion Feuchtwanger, T.S. Eliot, Uri Zvi Greenberg, Arthur Schnitzler, Stefan Zweig, and Franz Kafka.

JWST 387 MODERN JEWISH AUTHORS. (3) Introduction to representative novels written in America by Jews from the 1950s to the present. Issues of Jewish identity, ethnicity will inform our discussions. Focus on contemporary Jewish authors; consideration of the ways in which the complexities of American life are re-scripted in these novels.

- **JWST 404 LITERARY RESPONSE TO LOSS/SEPARATION.** (3) (Prerequisite: Some prior related university course at 300 level or higher, e.g. literature, psychology or social work. Permission of instructor required) (All texts in English)
- **JWST 411 TOPICS: MODERN HEBREW LITERATURE 1881-1948.** (3) (Prerequisite: Knowledge of advanced Hebrew essential)
- **JWST 412 TOPICS: MODERN HEBREW LITERATURE 2.** (3) (Prerequisite: Knowledge of advanced Hebrew essential)
- **JWST 438 SURVEY OF HEBREW LITERATURE 1.** (3) (Prerequisite: Advanced Hebrew or equivalent)
- **JWST 439 SURVEY OF HEBREW LITERATURE 2.** (3) (Prerequisite: Advanced Hebrew or equivalent)

JWST 445 THE POETRY OF NATIONALISM. (3) An introduction to the work of various modern 'national poets' - i.e. poets closely linked to national movements who expressed (or constructed) a particular national identity and whose work has lasting artistic value. These will include Mickiewicz of Poland, Tagore of India, Yeats of Ireland, and Bialik of pre-state Israel.

- **JWST 456 STUDIES IN THE HEBREW BIBLE.** (3) (Fall) (Requires Departmental approval) Supervised independent research in Hebrew scripture and its interpretation.
- **JWST 457 STUDIES IN THE HEBREW BIBLE.** (3) (Winter) (Requires Departmental approval)

JWST 474 MAIMONIDES' MISHNEH TORAH. (3) Study of the Moses Maimonides' Mishneh Torah, including such subjects as idolatry, repentance, and sacrifices, to torts, contracts, and public law.

- **JWST 475 THE RESPONSA LITERATURE.** (3)

JWST 480 ADVANCED YIDDISH 1. (3) (Fall) (Prerequisite: JWST 380 or permission of the instructor) (Not open to students who have

taken JWST 480D1 and JWST 480D2) This course is aimed at developing advanced proficiency in Yiddish language skills.

JWST 481 ADVANCED YIDDISH 2. (3) (Winter) (Prerequisite: JWST 380D1 and JWST 380D2; or permission of the instructor.) (Not open to students who have taken JWST 480D1 and JWST 480D2.) This course is aimed at introducing the study of literary texts in Yiddish.

- **JWST 485 TUTORIAL IN YIDDISH LITERATURE.** (3)
- **JWST 486 TUTORIAL IN YIDDISH LITERATURE.** (3)
- **JWST 487 TUTORIAL IN YIDDISH LITERATURE.** (3)

JWST 488 TUTORIAL IN YIDDISH LITERATURE. (3)

- **JWST 491 HONOURS THESIS 1.** (3) (Restriction: Open only to Honours and Joint Honours students.)
- **JWST 492 HONOURS THESIS 2.** (3) (Restriction: Open only to Honours and Joint Honours Students.)
- **JWST 502 CONTEMPORARY HEBREW LITERATURE.** (3) (Prerequisite: JWST 340 or permission of instructor) (Knowledge of Hebrew required)

JWST 510 JEWISH BIBLE INTERPRETATION 1. (3) (Not open to students who have taken JWST 512) The issues, approaches, and texts of Jewish Bible interpretation between the Biblical and talmudic eras: Bible interpretation in the Bible; in Greco-Roman Jewish literature; in the Mishnah, Tosefta, Targumim, and Talmudim; early Samaritan interpretation, Bible interpretation in ancient synagogue art, and in the massoretic literature.

JWST 511 JEWISH BIBLE INTERPRETATION 2. (3) (Not open to students who have taken JWST 512) The issues, problems, approaches, and texts of Jewish Bible interpretation in medieval, renaissance, early modern, and modern times. Interpretation in the Geonic, Ashkenazi, Sefardic, North African, Italian, European, Yemenite, North American and Israeli centres of Jewish Learning.

JWST 523 ANCIENT BIBLE INTERPRETATION. (3) Advanced level work in one aspect of Jewish Bible interpretation in ancient times.

JWST 534 HOMILETIC MIDRASH. (3) The issues and techniques of early rabbinic preaching and teaching the Bible as they emerge from a close reading of homiletical midrashic texts.

JWST 535 EXEGETIC MIDRASH. (3)

JWST 539 BIBLICAL INTERPRETATION 1. (3) Close readings in one or more texts of early rabbinic Bible interpretation: Mishnah, Tosefta, Halakhic and Aggadic Midrashim, Talmud.

JWST 540 BIBLICAL INTERPRETATION 2. (3) Close reading of medieval rabbinic bible interpretation: Ashkenazi and Sefaradi exegetes, commentators, philologists, philosophers and jurists.

JWST 543 MAIMONIDES AS PARSHAN. (3) (Requires Departmental approval) (Not open to students who have taken JWST 540) Biblical Interpretation in the Guide of the Perplexed and related writings.

- **JWST 544 NACHMANIDES AS PARSHAN.** (3)

JWST 548 MEDIEVAL PARSHANUT. (3) Advanced level work in one aspect of Jewish Bible interpretation in medieval times.

- **JWST 552 JUDAISM AND POVERTY.** (3) (Prerequisite: One course in Jewish Studies, Sociology or Social Work.)
- **JWST 556 MODERN PARSHANUT 1.** (3) (Not open to students who have taken JWST 560)

JWST 558 TOPICS: MODERN JEWISH THOUGHT. (3) Topic for 2003-04: Franz Rosenzweig's Star of Redemption. A close study of selections from this central text of twentieth-century Jewish thought.

JWST 562 MEDIEVAL ISLAMIC & JEWISH PHIL. (3) (Prerequisite: one course in Greek, Islamic or Jewish Philosophy, or permission of instructor.) (Topic for 2003: The Taste of God - Philosophy, Revelation and Mysticism in the thought of the Muslim theologian al-Ghazali and the Jewish poet and theologian Judah Halevi. Course offered jointly by the Dept. of Jewish Studies and the Institute of Islamic Studies.) Deals with the manifold points of contact between medieval Muslim and Jewish intellectual history. Muslim and Jewish philosophers, theologians and mystics belonged to the same

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

currents of thought, used the same language and studied the same sources in translation, proposing similar answers to questions that arose in the context of their respective religious traditions.

JWST 573 HISTORY OF HEBREW BIBLE TEXT. (3) (Prerequisite: permission of instructor) (Not open to students who have taken JWST 507) The text of the Hebrew Bible as it evolved between antiquity and the most recent printed edition. Attention will be given to the accurate reconstruction of the Bible from primary and secondary witnesses: Greek and Aramaic translations, Dead Sea Scrolls, and ancient quotations, and the Massoretic notes and lists.

JWST 575 TOPICS IN PARSHANUT. (3) Advanced level work in one aspect of Jewish Bible Interpretation that cuts across all periods of Jewish Bible interpretation.

● **JWST 576 JEWISH FAMILY LAW.** (3)

JWST 581 ARAMAIC LANGUAGE. (3) (Requires Departmental approval) (Not open to students who have taken JWST 506)

JWST 585 TUTORIAL: EASTERN EUROPEAN STUDIES 1. (3)

JWST 586 TUTORIAL: EASTERN EUROPEAN STUDIES 2. (3)

JWST 589 TUTORIAL IN JEWISH LITERATURE. (3) Supervised research in Modern Jewish history.

JWST 590 TUTORIAL IN JEWISH LITERATURE. (3) Supervised research in Modern Jewish history.

LACS – Latin American & Caribbean Studies

Offered by: Program in Latin-American and Caribbean Studies
Former Teaching Unit Code: 138

LACS 497 RESEARCH SEMINAR: LATIN AMERICA AND THE CARIBBEAN. (3) (Open to Program students and to others by written permission of the Program Adviser) (Ordinarily offered in alternate years) An interdisciplinary research seminar on topics of common interest to staff and students of the Latin-American and Caribbean Studies Program.

LACS 498 INDEPENDENT RESEARCH PROJECT. (3) (Prerequisite: LACS 497 and written permission of the Program Adviser) This course is designed to allow students to pursue interdisciplinary research projects under close supervision.

LING – Linguistics

Offered by: Department of Linguistics
Former Teaching Unit Code: 104

LING 200 INTRODUCTION TO THE STUDY OF LANGUAGE. (3) (Fall and Winter) (No prerequisite) General interest course; intended for students in all fields. Topics include: linguistic competence vs performance, language and the brain, language acquisition, sociolinguistics, historical linguistics, language universals, pragmatics.

LING 201 INTRODUCTION TO LINGUISTICS. (3) (Fall and Winter) (No prerequisite) (Note: This course is a prerequisite for all other courses in Linguistics except LING 200, LING 301 and LING 350) Primarily for students intending to take further courses in linguistics. Topics include: phonetics, phonology, morphology, syntax, and semantics. Students will be introduced to techniques of linguistic analysis.

LING 230 PHONETICS. (3) (Winter) (Prerequisite: LING 201. Not open to students who have taken LING 250.) Intensive training in the identification and production of speech sounds. Phonemic analysis. The investigation of how sounds function within a system.

LING 301 STRUCTURE OF ENGLISH. (3) (Winter) (Prerequisite: LING 200 or LING 201) (Students who have taken LING 371 are strongly encouraged not to take LING 301) A linguistic investigation of the grammar of Modern English, focusing on the structural characteristics of English sentence types, words and sounds.

LING 320 SOCIOLINGUISTICS 1. (3) (Winter) (Prerequisite: LING 201. Not open to students who have taken LING 325.) A survey of

language in its social context. The main focus will be on the influence of social factors like age, gender, social class and speech style on linguistic variation and change. Contact amongst languages (e.g. in Montreal) and the birth and death of languages will also be discussed.

LING 331 PHONOLOGY 1. (3) (Fall) (Prerequisite: LING 230. Not open to students who have taken LING 351.) Introduction to phonological theory and analysis.

LING 350 LINGUISTIC ASPECTS OF BILINGUALISM. (3) (Winter) (Prerequisite: LING 200 or LING 201) Linguistic competence and performance in bilinguals: the organization of the bilingual's grammar. Syntactic constraints on code mixing: How many grammars are involved? Unidirectional and bidirectional grammatical interference. Structural distance between genetically related and unrelated languages and its effect on the organization of the bilingual's grammar.

LING 355 LANGUAGE ACQUISITION 1. (3) (Fall) (Prerequisite: LING 201. Not open to students who have taken LING 321.) A critical study of the application of linguistic theory and description to first and second language learning. Topics include: the acquisition of sounds, syntax and word meanings; acquisition strategies; properties of the input; theories of first and second language acquisition.

LING 370 INTRODUCTION TO SEMANTICS AND PRAGMATICS. (3) (Winter) (Prerequisite: PHIL 210) Introduction to the study of the meaning of sentences (through the application of rudimentary predicate logic), and the study of how meaning is modulated by use (pragmatics).

LING 371 SYNTAX 1. (3) (Winter) (Prerequisite: LING 201. Not open to students who have taken LING 360.) Introduction to the study of generative syntax of natural languages, emphasizing basic concepts and formalism: phrase structure rules, transformations, and conditions on rules.

LING 390 NEUROSCIENCE OF LANGUAGE. (3) (Prerequisite: An introductory course in Linguistics, Psychology or Neuroscience at the 200 level or above.) The neurobiological study of the human language faculty. Theoretical and experimental approaches to neurolinguistics, focusing on linguistic capacity in the healthy and damaged brain.

★ **LING 410 STRUCTURE OF A SPECIFIC LANGUAGE 1.** (3) (Winter) (Prerequisite: LING 230, LING 331, and LING 371, or permission of instructor) Application and refinement of analytical methods in phonology, morphology, and syntax to phenomena from a specific language. One focus will be the identification of empirical generalizations which form the basis for the development of the theory. The language of study will vary from year to year.

● ★ **LING 415 FIELD METHODS OF LINGUISTICS.** (3) (Winter) (Prerequisites: LING 230, LING 331 and LING 371. Not open to students who have taken LING 471.)

LING 419 LINGUISTIC THEORY 1. (3) (Fall) (Prerequisite: two of LING 331, LING 370, LING 371, LING 440. Not open to students who have taken LING 491.) This course looks at the nature and structure of linguistic theory.

LING 425 HISTORICAL LINGUISTICS. (3) (Fall) (Prerequisite: LING 230. Not open to students who have taken LING 400.) An examination of how languages change over time and the methods that allow us to study linguistic history. Topics include: types of language change (sound change, analogy, etc.) linguistic reconstruction, the origins of modern languages.

LING 440 MORPHOLOGY. (3) (Fall) (Prerequisite: LING 230 or LING 371, preferably both.) An introduction to the study of the internal structure of words. Topics will include the different ways words are formed in languages, how sound changes take place within words, how words are used in sentences.

● ★ **LING 450 LINGUISTIC THEORY AND PROCESSING.** (3) (Prerequisite: LING 371)

LING 451 ACQUISITION OF PHONOLOGY. (3) (Prerequisite: LING 331; a course in language acquisition highly recommended.) Exploration of the development of prosodic and segmental structure in

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

children, with an emphasis on current theoretically-informed work in this area.

LING 455 SECOND LANGUAGE SYNTAX. (3) (Prerequisite: LING 301 or LING 371.) The nature of the linguistic knowledge acquired by second language learners, focussing on description and explanation of second language syntax and morphology.

LING 480D1 HONOURS THESIS. (3) (Not open to students who have taken LING 482.) (Students must also register for LING 480D2.) (No credit will be given for this course unless both LING 480D1 and LING 480D2 are successfully completed in consecutive terms) (LING 480D1 and LING 480D2 together are equivalent to LING 480.) Honours thesis.

LING 480D2 HONOURS THESIS. (3) (Not open to students who have taken LING 482.) (Prerequisite: LING 480D1.) (No credit will be given for this course unless both LING 480D1 and LING 480D2 are successfully completed in consecutive terms) (LING 480D1 and LING 480D2 together are equivalent to LING 480.) See LING 480D1 for course description.

LING 481D1 JOINT HONOURS THESIS. (1.5) (Students must also register for LING 481D2) (No credit will be given for this course unless both LING 481D1 and LING 481D2 are successfully completed in consecutive terms)

LING 481D2 JOINT HONOURS THESIS. (1.5) (Prerequisite: LING 481D1) (No credit will be given for this course unless both LING 481D1 and LING 481D2 are successfully completed in consecutive terms)

LING 483 PROSEMINAR 1. (3) (Fall or Winter) (Permission of instructor.) Intensive study of a selected field or topic.

LING 484 PROSEMINAR 2. (3) (Fall or Winter) (Permission of instructor.) Intensive study of a selected field or topic.

LING 488 INDEPENDENT STUDY 1. (3) (Fall or Winter) (Permission of instructor.) Independent study of a selected field or topic.

LING 489 INDEPENDENT STUDY 2. (3) (Fall or Winter) (Permission of instructor.) Independent study of a selected field or topic.

★ **LING 520 SOCIOLINGUISTICS 2.** (3) (Fall) (Prerequisite: LING 320 or permission of instructor.) A seminar on variationist "micro-sociolinguistics", including a survey of the most important primary literature on sociolinguistic variation and introduction to sociolinguistic fieldwork.

● ★ **LING 521 DIALECTOLOGY.** (3) (Fall) (Prerequisite: LING 230 and LING 320)

● ★ **LING 525 TOPICS IN HISTORICAL LINGUISTICS.** (3) (Fall) (Not open to students who have taken LING 541.) (Prerequisites: LING 371, LING 425 and LING 571, which can be taken concurrently, or permission of the instructor.)

● **LING 531 PHONOLOGY 2.** (3) (Winter) (Not open to students who have taken LING 530.) (Prerequisites: LING 331 and permission of instructor.)

LING 555 LANGUAGE ACQUISITION 2. (3) (Winter) (Prerequisites: LING 355 and LING 371 and permission of instructor) A detailed overview of recent experimental work on first language acquisition of syntax within the principles and parameters framework, concentrating on both theoretical and methodological issues.

LING 560 FORMAL METHODS IN LINGUISTICS. (3) (Fall) (Prerequisite: LING 370 and permission of instructor) (Not open to students who have taken MATH 240) This course presents the formal methods used in the study of language (namely, the theories of sets, relations, functions, partial orders, and lattices as well as the principle of mathematical induction).

LING 571 SYNTAX 2. (3) (Fall) (Prerequisite: LING 371) This course extends and refines the theory of grammar developed in LING 371, while introducing some primary literature and developments (in certain modules of the grammar such as phrase structure, wh-movement, and binding).

● **LING 590 INTRODUCTION TO NEUROLINGUISTICS.** (3) (Prerequisite: 12 credits in Linguistics)

MEST – Middle East Studies

Offered by: Faculty of Arts
Former Teaching Unit Code: 193

MEST 496 INDEPENDENT READING AND RESEARCH. (3)

MUAR – Music - Arts Faculty

Offered by: Department of Theory (Faculty of Music)
Former Teaching Unit Code: 210

MUAR courses are considered to be courses taught in the Faculty of Arts, but they cannot be credited toward the B.A. or B.Sc. Music programs.

Students who have completed MUTH 110, MUTH 111, MUTH 210, or MUTH 211, or who have Matriculation Music or McGill Conservatory Theory Secondary V or its equivalent may not register for MUAR 201 or MUAR 202.

Students who read music and have an instrumental or vocal background may proceed directly to MUAR courses at the 300 level.

MUAR 201 BASIC MATERIALS: WESTERN MUSIC. (3) (3 hours) A combination of elementary theory and ear training (sightsinging and aural recognition), and basic piano skills. Topics include: notation of pitch and rhythm, intervals, scales and modes, concept of key, triads and seventh chords, introductory melody and accompaniment writing.

MUAR 202 BASIC MATERIALS: WESTERN MUSIC 2. (3) (3 hours) (Prerequisite: MUAR 201 or permission of instructor) Integrated course in music theory with creative applications of acquired skills. Analysis and writing: concepts of melodic organization, elementary harmonic progressions, two-part contrapuntal techniques, fundamental formal procedures, examination of popular song and jazz. Development of individual skills: intermediate sightsinging, aural recognition, keyboard techniques, small group performance in class.

MUAR 211 THE ART OF LISTENING. (3) (3 hours) An introduction to the major forms and styles in Western music from the baroque to the present, with emphasis on guided listening in the classroom. The ability to read music is not a prerequisite.

● **MUAR 260 BASIC MATERIALS OF JAZZ.** (3) Study of contemporary and traditional jazz improvisation. Exploration of harmonic framework of music from the jazz repertoire (melody, voice leading, traditional jazz writing). Characteristic sounds of predominant scales and modes and their potential uses. Common song forms and their harmonic devices.

MUAR 374 SPECIAL TOPICS IN MUSIC. (3) (3 hours) A course whose topics will correspond to special historical events and their associated musical, political, and cultural contexts.

● **MUAR 381 MUSIC IN GOTHIC AND RENAISSANCE CULTURE.** (3)

MUAR 384 ROMANTICISM AND THE PIANO. (3) (3 hours) (Prerequisite: MUAR 201 or MUAR 211 or permission of instructor) A survey of nineteenth-century European piano music: the piano virtuoso as cult figure, the social functions of the piano, women and the piano, and developing Romantic sensibilities as expressed in piano music throughout the century. Repertoire may include works by Beethoven, Chopin, Liszt, and Rachmaninoff, among others.

MUAR 387 THE OPERA. (3) (3 hours) (Prerequisite: MUAR 201 or MUAR 211) A survey of opera from c.1600 to the present. Opera as ritual, opera as spectacle, opera as catharsis, opera as business, opera and its literary models. The continuing relevance of the operatic experience today.

MUAR 389 THE SYMPHONY AND CONCERTO. (3) (3 hours) (Prerequisite: MUAR 201 or MUAR 211) An historical overview of two major genres in the current concert repertoire: baroque foundations, the Viennese achievement, Beethoven's influence, visionary

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ies and nationalists after 1850, cross-currents in the twentieth century.

MUAR 392 POPULAR MUSIC AFTER 1945. (3) (3 hours) (Prerequisite: MUAR 201 or MUAR 211 or permission of instructor) An historical survey of major artists, genres, and styles in the most widespread traditions of postwar commercial music. The course will include practice in techniques of listening, discussion of the shaping institutions of commercial music, and consideration of the interaction of musical style and culture.

MUAR 393 INTRODUCTION TO JAZZ. (3) (3 hours) (Prerequisite: MUAR 201 or MUAR 211 or permission of instructor. Open only to non-Music majors) A survey of the development of jazz from its late 19th-century origins in America to the present day, with an introduction to musical concepts relevant to the genre and consideration of sociocultural issues.

NAST – North American Studies

Offered by: Faculty of Arts
Former Teaching Unit Code: 158

NAST 471 TOPICS IN NORTH AMERICAN STUDIES 1. (3) (See Adviser)

PHIL – Philosophy

Offered by: Department of Philosophy
Former Teaching Unit Code: 107

Any 200-level course can be taken without prerequisites.

300-level courses without stated prerequisites may be taken without prior study of philosophy. Students should consult individual instructors.

Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.

Some courses are given only in alternate years.

PHIL 200 INTRODUCTION TO PHILOSOPHY 1. (3) (Philosophy students may use either PHIL 200 or PHIL 201 towards their program requirements, but not both. Students may, however, take both for credit (using the second as an elective), as the content in PHIL 201 does not overlap with PHIL 200) A course treating some of the central problems of philosophy: the mind-body problem, freedom, scepticism and certainty, fate, time, and the existence of God.

PHIL 201 INTRODUCTION TO PHILOSOPHY 2. (3) (Philosophy students may use either PHIL 200 or PHIL 201 towards their program requirements, but not both. Students may, however, take both for credit (using the second as an elective), as the content in PHIL 201 does not overlap with PHIL 200) An introduction to some of the major problems of philosophy. This course does not duplicate PHIL 200.

PHIL 210 INTRODUCTION TO DEDUCTIVE LOGIC 1. (3) (Not open to students who are taking or have taken MATH 318) An introduction to propositional and predicate logic; formalization of arguments, truth tables, systems of deduction, elementary metaresults, and related topics.

● **PHIL 220 INTRODUCTION TO HISTORY AND PHILOSOPHY OF SCIENCE 1.** (3)

PHIL 221 INTRODUCTION TO HISTORY AND PHILOSOPHY OF SCIENCE 2. (3) A survey of the development of modern science since the Eighteenth Century.

PHIL 230 INTRODUCTION TO MORAL PHILOSOPHY 1. (3) A survey of a number of historically important and influential theories. Philosophers to be discussed may include Aristotle, Hume, Kant, Bentham, Mill, and Moore.

PHIL 237 CONTEMPORARY MORAL ISSUES. (3) An introductory discussion of central ethical questions (the value of persons, or the relationship of rights and utilities, for example) through the investi-

gation of currently disputed social and political issues. Specific issues to be discussed may include pornography and censorship, affirmative action, civil disobedience, punishment, abortion, and euthanasia.

● **PHIL 240 POLITICAL PHILOSOPHY 1.** (3)

PHIL 242 INTRODUCTION TO FEMINIST THEORY. (3) An introduction to feminist theory as political theory. Emphasis is placed on the plurality of analyses and proposals that constitute contemporary feminist thought. Some of the following are considered: liberal feminism, marxist and socialist feminism, radical feminism, post-modern feminism, francophone feminism, and the contributions to feminist theory by women of colour and lesbians.

PHIL 301 PHILOSOPHICAL FUNDAMENTALS. (3) (Prerequisites: two previous courses in philosophy, one of which must be PHIL 210 or written consent of the Department) (Open only to and required of Philosophy Honours and Joint Honours students) An intensive study of basic philosophical skills; reading, writing, analysis, and argumentation.

PHIL 304 CHOMSKY. (3) Philosophical aspects of Chomsky's contribution to psychology, linguistic theory, theories of human nature, and to politics.

PHIL 306 PHILOSOPHY OF MIND. (3) A survey of major positions of the mind-body problem, focusing on such questions as: Do we have minds and bodies? Can minds affect bodies? Is mind identical to body? If so, in what sense "identical"? Can physical bodies be conscious.

PHIL 310 INTERMEDIATE LOGIC. (3) (Prerequisite: PHIL 210 or equivalent) A second course in Logic. NB. The course will be technical in nature, and some mathematical aptitude is essential. The emphasis is on the expressive properties of standard logical systems, including implications for the philosophy of mathematics. We will study the Completeness of First-Order Logic, then the 'limitative' theorems of Tarski and Gödel.

PHIL 334 ETHICS 1. (3) (Prerequisite: one of PHIL 230, PHIL 237, PHIL 242, or written permission of the instructor) A course focusing on such central questions of ethical theory as: Why be moral? Are moral judgments subjective? On what is morality based? What is the nature of the good.

PHIL 336 AESTHETICS. (3) An introduction to issues central to aesthetic theory; the nature of aesthetic judgment, perception of the aesthetic object, the nature of the art object.

● **PHIL 340 PHILOSOPHY OF THE SOCIAL SCIENCES 1.** (3)

PHIL 341 PHILOSOPHY OF SCIENCE 1. (3) A discussion of philosophical problems as they arise in the context of scientific practice and enquiry. Such issues as the philosophical presuppositions of the physical and social sciences, the nature of scientific method and its epistemological implications will be addressed.

PHIL 343 BIOMEDICAL ETHICS. (3) An investigation of ethical issues as they arise in the practice of medicine (informed consent, e.g.) or in the application of medical technology (in vitro fertilization, euthanasia, e.g.)

PHIL 345 GREEK POLITICAL THEORY. (3) (Not open to students who have taken POLI 333) An examination of the ethical and political theories of ancient Greece, especially those of Plato and Aristotle.

PHIL 348 PHILOSOPHY OF LAW 1. (3) (This course is intended for students with a non-professional interest in law, as well as for those considering law as a profession) A discussion of the nature of justice and law, and of the relationship between them.

● **PHIL 350 HISTORY AND PHILOSOPHY OF ANCIENT SCIENCE.** (3)

PHIL 353 THE PRESOCRATIC PHILOSOPHERS. (3) An examination of the surviving fragments of the presocratic philosophers and schools of philosophy, as well as later reports of their views.

PHIL 354 PLATO. (3) An examination of some of the philosophical problems (those in logic, epistemology, metaphysics, and ethics, e.g.) found in a selection of Plato's dialogues.

PHIL 355 ARISTOTLE. (3) An examination of selected works by Aristotle. The course considers issues in moral philosophy as well

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

as those found in the logical treatises, the Physics and Metaphysics, and in the philosophy of mind.

PHIL 356 EARLY MEDIEVAL PHILOSOPHY. (3) An examination of selected works in the Christian, Islamic and Jewish traditions. Topics in moral and political philosophy, logic and metaphysics, philosophical psychology and epistemology, philosophy of science, and philosophical theology may be discussed.

● **PHIL 357 LATE MEDIEVAL AND RENAISSANCE PHILOSOPHY.** (3)

PHIL 360 17TH CENTURY PHILOSOPHY. (3) An examination of the work of such seventeenth-century philosophers as Descartes, Hobbes, Gassendi, Malebranche, Leibniz, and the Cambridge Platonists.

PHIL 361 18TH CENTURY PHILOSOPHY. (3) A survey of eighteenth century philosophy, especially British philosophy. Attention is given to fundamental metaphysical, epistemological, and moral issues as reflected in the work of such philosophers as Locke, Shaftesbury, Berkeley, Hutcheson, Butler, Hume and Reid.

PHIL 366 18TH AND EARLY 19TH CENTURY GERMAN PHILOSOPHY. (3) (Prerequisite: PHIL 360 or PHIL 361 is recommended) An examination of the works of such philosophers as Kant, Fichte, Jacobi, Schelling, and Hegel.

PHIL 367 19TH CENTURY PHILOSOPHY. (3) (Prerequisite: A previous course in philosophy is recommended) An examination of the works of such 19th century philosophers as Mach, Helmholtz, Dedekind, Frege, Marx, Kierkegaard, Schopenhauer, Nietzsche, Mill and Bradley.

PHIL 370 PROBLEMS IN ANALYTIC PHILOSOPHY. (3) An introduction to the central questions in the analytic tradition, through the works of important early figures in that tradition. Philosophers to be discussed may include: Frege, Russell, Wittgenstein, Ramsay, Carnap and the "logical positivists".

PHIL 375 EXISTENTIALISM. (3) (Prerequisite: one course in philosophy) This course will examine the nature of existentialist thought as represented in various philosophical and literary texts. Particular themes to be examined include freedom, alienation, responsibility and choice, and the nature of self.

PHIL 397 TUTORIAL. (3) (Open to second year Full Honours students in Philosophy and to other students, with consent of the Department)

PHIL 398 TUTORIALS. (3) (Open to second year Full Honours students in Philosophy and to other students, with consent of the Department)

● **PHIL 410 ADVANCED TOPICS IN LOGIC 1.** (3) (Prerequisite: PHIL 310 or equivalent)

PHIL 411 TOPICS IN PHILOSOPHY OF LOGIC AND MATHEMATICS. (3) (Prerequisites: PHIL 210 or the equivalent, and one intermediate course in philosophy) A course focusing on some philosophical issue (e.g., the nature of numbers or the relation of truth to provability) as it arises in the study of mathematics and logic.

● **PHIL 415 PHILOSOPHY OF LANGUAGE.** (3) (Prerequisites: PHIL 210 or equivalent and one intermediate course in philosophy)

● **PHIL 419 EPISTEMOLOGY.** (3) (Prerequisite: PHIL 210 or equivalent and one intermediate course in philosophy)

PHIL 421 METAPHYSICS. (3) (Prerequisites: PHIL 210 or equivalent and one intermediate course in philosophy) An examination of central questions in metaphysics in their historical and contemporary forms. Topics may be chosen from such issues as: personal identity, the nature of space and time, the nature of events and properties, possible worlds, and the problem of realism.

PHIL 432 PHILOSOPHY OF RELIGION 2. (3)

PHIL 434 ETHICS 2. (3) (Prerequisite: PHIL 334 or written permission of the instructor) Advanced discussion of one or more themes in ethics. Topics will vary from year to year but may include such issues as the nature of rights and duties, moral realism and anti-realism, or the place of reason in morality.

PHIL 436 AESTHETICS 2. (3) (Prerequisite: PHIL 336 or written permission of the instructor) An advanced discussion of issues in aesthetics.

PHIL 440 PHILOSOPHY OF SOCIAL SCIENCES 2. (3) (Prerequisite: PHIL 340 or written permission of the instructor) An advanced course on such topics as methodology of, or explanation, in the social sciences or models of rationality. Topics will vary from year to year.

PHIL 441 PHILOSOPHY OF SCIENCE 2. (3) (Prerequisite: PHIL 341 or written permission of the instructor) An analysis of some key philosophical ideas in science and technology, e.g. problem, explanation, forecast, testability and truth.

PHIL 442 TOPICS IN FEMINIST THEORY. (3) (Prerequisite: PHIL 242 and one intermediate course in philosophy) Advanced discussion of topical and central themes in feminist theory.

● **PHIL 446 CURRENT ISSUES IN POLITICAL PHILOSOPHY.** (3) (Prerequisite: at least one course in political philosophy)

● **PHIL 450 MAJOR PHILOSOPHERS 1.** (3) (Prerequisite: one intermediate course in philosophy)

PHIL 452 LATER GREEK PHILOSOPHY. (3) (Prerequisite: PHIL 354 or PHIL 355) (Not open to students who have taken PHIL 351) An examination of some of the major post-Aristotelian schools of philosophy. Texts from the Peripatetic, Stoic, Epicurean, Sceptical, Platonic, and medical traditions may be considered. Problems in logic, ethics, physics, epistemology, and metaphysics will be addressed.

● **PHIL 453 ANCIENT METAPHYSICS AND NATURAL PHILOSOPHY.** (3)

● **PHIL 454 ANCIENT MORAL THEORY.** (3)

PHIL 460 MAJOR PHILOSOPHERS 2. (3) This seminar will give detailed attention to the work of one philosopher or to a single philosophical theme addressed by several philosophers. Emphasis will be placed on understanding how the metaphysical, epistemological, and moral views of a figure or figures are internally related.

PHIL 470 TOPICS IN CONTEMPORARY ANALYTIC PHILOSOPHY. (3) (Prerequisite: PHIL 370, PHIL 415 or written permission of instructor) An advanced discussion of major themes in the analytic tradition.

PHIL 474 PHENOMENOLOGY. (3) (Prerequisite: one intermediate course in philosophy) A study of phenomenology from a historical and thematic perspective. The course will typically involve the study of central thinkers such as Husserl, Heidegger, or Merleau-Ponty, with an examination of the nature and development of the phenomenological movement.

PHIL 475 TOPICS IN CONTEMPORARY EUROPEAN PHILOSOPHY. (3) (Prerequisite: one intermediate course in philosophy) Advanced discussion of selected themes in contemporary European philosophy.

PHIL 480 TOPICS IN THE HISTORY OF PHILOSOPHY. (3) (Prerequisite: one intermediate course in philosophy) An advanced discussion of some theme and/or problem in the history of philosophy.

PHIL 481 TOPICS IN PHILOSOPHY. (3)

PHIL 497 TUTORIAL. (3) Open to third year Full Honours students in Philosophy, and to other students, with consent of the Department.

May also be available as: PHIL 497N1 and PHIL 497N2

PHIL 498 TUTORIALS. (3) Open to third year Joint Honours students in Philosophy, and to other students, with consent of the Department.

May also be available as: PHIL 498N1 and PHIL 498N2

● **PHIL 499 TUTORIALS.** (6)

PHIL 499D1 TUTORIALS. (3) (Students must also register for PHIL 499D2) (No credit will be given for this course unless both PHIL 499D1 and PHIL 499D2 are successfully completed in consecutive terms) (PHIL 499D1 and PHIL 499D2 together are equivalent to PHIL 499) Open to third year Full Honours students in Philosophy, and to other students, with consent of the Department.

PHIL 499D2 TUTORIALS. (3) (Prerequisite: PHIL 499D1) (No credit will be given for this course unless both PHIL 499D1 and PHIL

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

499D2 are successfully completed in consecutive terms) (PHIL 499D1 and PHIL 499D2 together are equivalent to PHIL 499) See PHIL 499D2 for course description.

May also be available as: **PHIL 499N1 and PHIL 499N2**

● **PHIL 506 SEMINAR: PHILOSOPHY OF MIND.** (3) (Prerequisite: PHIL 306. Open only to students as indicated above and to Cognitive Science Minors) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.)

● **PHIL 507 SEMINAR: COGNITIVE SCIENCE.** (3) (Prerequisites: PHIL 306, PHIL 415 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

● **PHIL 510 SEMINAR: ADVANCED LOGIC 2.** (3) (Prerequisite: PHIL 310 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.)

PHIL 511 SEMINAR: PHILOSOPHY OF LOGIC AND MATHEMATICS. (3) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.)

PHIL 515 SEMINAR: PHILOSOPHY OF LANGUAGE. (3) (Prerequisite: PHIL 415 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department) An advanced course devoted to a topic in the philosophy of language.

PHIL 519 SEMINAR: EPISTEMOLOGY. (3) (Prerequisite: PHIL 420 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.) An advanced course devoted to a topic in the theory of knowledge. Subject varies from year to year.

● **PHIL 521 SEMINAR: METAPHYSICS.** (3) (Prerequisite: PHIL 421 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.)

PHIL 534 SEMINAR: ETHICS. (3) (Prerequisite: PHIL 334 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

PHIL 541 SEMINAR: PHILOSOPHY OF SCIENCE. (3) (Prerequisite: PHIL 441 or other requirements specified by the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department) An advanced course devoted to a topic in the philosophy of science.

PHIL 543 SEMINAR: MEDICAL ETHICS. (3) (Prerequisite: PHIL 343 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department) An advanced course devoted to a particular philosophical problem as it arises in the context of medical practice or the application of medical technology.

PHIL 544 POLITICAL THEORY. (3) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

● **PHIL 548 SEMINAR: PHILOSOPHY OF LAW.** (3) (Prerequisite: PHIL 348 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

PHIL 551 SEMINAR: ANCIENT PHILOSOPHY 2. (3) (Prerequisite: at least one course in ancient philosophy and the specific requirements of individual instructors) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint

Honours students, except by written permission of the Department) An advanced course on a philosopher or philosophical issue articulated in antiquity.

● **PHIL 556 SEMINAR: MEDIEVAL PHILOSOPHY.** (3) (Prerequisite: PHIL 345 or PHIL 357 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

● **PHIL 560 SEMINAR: 17TH CENTURY PHILOSOPHY.** (3) (Prerequisite: PHIL 360 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

PHIL 561 SEMINAR: 18TH CENTURY PHILOSOPHY. (3) (Prerequisite: PHIL 361 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.) An advanced course on an eighteenth-century philosopher or philosophical issue.

PHIL 567 SEMINAR: 19TH CENTURY PHILOSOPHY. (3) (Prerequisite: PHIL 366 or PHIL 367 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.) An advanced course on 19th-century philosophy or philosophical issue.

● **PHIL 570 SEMINAR: CONTEMPORARY ANALYTIC PHILOSOPHY.** (3) (Prerequisite: PHIL 370 or PHIL 415 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department.)

PHIL 575 SEMINAR: CONTEMPORARY EUROPEAN PHILOSOPHY. (3) (Prerequisite: PHIL 475 or written permission of the instructor) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department) An advanced course on contemporary European philosophy or some important issue in the Continental tradition.

● **PHIL 580 SEMINAR: PROBLEMS OF PHILOSOPHY 1.** (3) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

● **PHIL 581 SEMINAR: PROBLEMS OF PHILOSOPHY.** (3) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department)

PHIL 590 SEMINAR: SPECIAL TOPICS IN PHILOSOPHY. (3) (Prerequisites: one course in philosophy) (Seminars are open only to graduate students and final year Philosophy Majors, Honours and Joint Honours students, except by written permission of the Department) Psychoanalysis: a critical examination. Depending on the interests of the class, areas covered would include: psychoanalytic epistemology, psychoanalysis and the pre-Socratics, psychoanalysis and tragedy, reasons versus causes in psychoanalysis, hermeneutics, psychoanalytic truth, self-deception, irrationality, paradox, creativity, internal object world and its relation to external objects.

POLI – Political Science

Offered by: Department of Political Science

Former Teaching Unit Code: 160

POLI 211 COMPARATIVE GOVERNMENT AND POLITICS. (3) (Fall) Introduction to the study of comparative politics as it applies both to the developed world and developing countries. The course presents the basic concepts and approaches used in the field of comparative politics and it focuses on patterns of similarity and difference in a way political institutions and processes are structured in a wide variety of national contexts.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

POLI 212 GOVERNMENT AND POLITICS - DEVELOPED WORLD. (3) (Winter) The nature of politics in a few selected nations of the industrialized world, applying the concepts introduced in POLI 211 to specific national contexts. Countries studied will be drawn principally from Europe and North America.

POLI 221 GOVERNMENT OF CANADA. (3) (Fall) An examination of the central governmental institutions, including parliament, federalism, and the judiciary.

POLI 222 POLITICAL PROCESS AND BEHAVIOUR IN CANADA. (3) (Winter) (Not open to students who have taken 160-320 prior to 1996-97) An introduction to contemporary political life in Canada that examines how demands are identified and transmitted through the political systems. Emphasis will be placed on: the Canadian political culture; socialization and political participation; the electoral system; elections and voting; the role and structure of political parties; and the influence of organized interest.

POLI 226 LA VIE POLITIQUE QUÉBÉCOISE. (3) (An ability to understand and read French is required; writing and speaking ability are not) (This course is offered in English and French in alternate years. For 2003-04 it will be offered in English) Une introduction à la vie politique québécoise à travers l'étude des institutions, des idéologies et des comportements politiques. Une attention particulière sera accordée à la structure et aux changements dans le système politique québécoise.

POLI 227 DEVELOPING AREAS/INTRODUCTION. (3) (Winter) An introduction to Third World politics. A comparative examination of the legacies of colonialism, the achievement of independence, and contemporary dynamics of political and socio-economic development in Africa, Asia and Latin America. Topics include modernization, dependency, state-building and national integration, revolution, the role of the military, and democratization.

POLI 231 INTRODUCTION TO POLITICAL THEORY. (3) (Fall) The course introduces students to political theory through critical examination of classic texts in the history of political thought. In addition to gaining an understanding of several different traditions of political thought, students are encouraged to develop their skills in textual interpretation, critical reasoning, and essay-writing.

POLI 232 MODERN POLITICAL THOUGHT. (3) (Winter) The course introduces students to modern political thought through a critical examination of some of the key political ideologies and concepts of contemporary political discourse. Themes vary from year to year, and may include liberalism, conservatism, socialism, feminism, democracy, power, justice, and freedom.

POLI 243 INTERNATIONAL POLITICS OF ECONOMIC RELATIONS. (3) (Winter) An introduction to international relations, through examples drawn from international political economy. The emphasis will be on the politics of trade and international monetary relations.

POLI 244 INTERNATIONAL POLITICS: STATE BEHAVIOUR. (3) (Fall) Offers a comprehensive introduction to the behaviour of nation states. Explores how states make foreign policy decisions and what motivates their behaviour. Other covered topics include the military and economic dimensions of state behaviour, conflict, cooperation, interdependence, integration, globalisation, and change in the international system.

POLI 300D1 DEVELOPING AREAS/REVOLUTION. (3) (Prerequisite: A basic course in Comparative Politics or written permission of the instructor) (Students must also register for POLI 300D2) (No credit will be given for this course unless both POLI 300D1 and POLI 300D2 are successfully completed in consecutive terms) The post WW II revolutionary process in the third world. Attention to the nature of the revolutionary process in the struggle for national liberation both where this approach succeeded and failed. Examples drawn from Asia, Africa and Latin America. Students will be required to do a thorough case study.

POLI 300D2 DEVELOPING AREAS/REVOLUTION. (3) (Prerequisite: POLI 300D1) (No credit will be given for this course unless both POLI 300D1 and POLI 300D2 are successfully completed in consecutive terms) See POLI 300D1 for course description.

● **POLI 301 THE MODERN INTERNATIONAL SYSTEM.** (3) (Prerequisite: A 200-level course in International Relations. Not open to students who have taken 160-243 prior to 1997-98)

POLI 311 TECHNIQUES OF EMPIRICAL RESEARCH. (3) An introduction to empirical political research. Among the topics considered are the formulation of research problems, the selection of samples, interviewing, questionnaire construction, and the analysis and interpretation of data.

POLI 315 APPROACHES TO POLITICAL ECONOMY. (3) (Prerequisite: POLI 211 or POLI 212 and one preferably university-level economics course) Influential traditions in political economy. Focus on how these attempted to integrate the economic and political. Application of economic analysis to social and political phenomena ("social choice"). Recent efforts to combine the deductive logic of economics with comparative empirical analysis of actors in different institutional settings. Extension to the international political economy.

POLI 318 COMPARATIVE LOCAL GOVERNMENT. (3) (Prerequisite: POLI 211 or POLI 212 or written permission of instructor) An examination of the organization and conduct of local government in Canada, the United States, and selected European countries. Attention to theories of local government, the criteria for comparative analysis, the provision of public goods and bads, urban political patterns and the constitution of new institutional arrangements to deal with "urban crises" in North America.

POLI 319 POLITICS OF LATIN AMERICA. (3) (Prerequisite: A basic course in Comparative Politics or a course on the region or written permission of the instructor) This course will deal with the dynamics of political change in Latin America today.

POLI 320 ISSUES IN CANADIAN DEMOCRACY. (3) (Prerequisite: At least one other course in Canadian or Comparative Government and Politics or permission of instructor) Critical analysis of selected issues and debates in Canadian politics, including citizen participation, electoral system effects, party financing, office-seeking, approaches to representation, and direct democracy and non-party alternatives. Topics are examined from both the perspective of the general population and the specific experience of women and ethno-racial minorities.

POLI 321 ISSUES: CANADIAN PUBLIC POLICY. (3) (Prerequisite: at least one other course in Canadian or Comparative Politics) The Canadian political process through an analysis of critical policy issues in community development, welfare state, education, and institutional reforms in public service delivery systems. Diagnostic and prescriptive interpretations of public choices in a federal-parliamentary regime.

POLI 322 POLITICAL CHANGE IN SOUTH ASIA. (3) (Prerequisite: A basic course in Comparative Politics or a course on the region or written permission of the instructor) Political change in South Asia in late colonial and post-colonial periods. Issues covered include social and cultural history; colonial rule, nationalism and state formation; democratic and authoritarian tendencies; economic policies and consequences; challenges to patterns of dominance and national boundaries; prospects for democracy, prosperity and equality.

POLI 323 DEVELOPING AREAS/CHINA AND JAPAN. (3) (Winter) (Prerequisite: A basic course in Comparative Politics or a course on the region or written permission of the instructor) A survey of traditional and modern political society in China and Japan. Special emphasis is placed on governmental policy and institutions in relation to ideology in the Peoples' Republic of China and post-1945 Japan.

POLI 324 DEVELOPING AREAS/AFRICA. (3) (Prerequisite: A basic course in Comparative Politics or a course on the region or written permission of the instructor) The government and politics of African states south of the Sahara with reference to the ideological and institutional setting as influenced by the forces of tradition and the impact of Western colonialism.

POLI 325D1 GOVERNMENT AND POLITICS: UNITED STATES. (3) (Prerequisite: POLI 211 or POLI 212 or written permission of the instructor) (Students must also register for POLI 325D2) (No credit will be given for this course unless both POLI 325D1 and POLI

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

325D2 are successfully completed in consecutive terms) A survey of the American political system, with emphasis on the constitutional and philosophical setting, the institutions and their interactions, the political process, public policy issues, and political change.

POLI 325D2 GOVERNMENT AND POLITICS: UNITED STATES. (3) (Prerequisite: POLI 325D1) (No credit will be given for this course unless both POLI 325D1 and POLI 325D2 are successfully completed in consecutive terms) See POLI 325D1 for course description.

POLI 326 PROVINCIAL POLITICS. (3) (Prerequisite: A basic course in Canadian Government or Politics or permission of the instructor) The effect of regional and provincial culture on the operation of political parties and the institutions of government; the effect of institutional modernization on provincial governments; the role of provincial sub-systems within the Canadian political system.

● **POLI 328 MODERN POLITICS IN WESTERN EUROPE.** (3) (Prerequisites: POLI 211 or POLI 212, or POLI 227)

POLI 329 POST-SOVIET POLITICS. (3) (Prerequisite: POLI 211, POLI 212, or written consent of instructor; Soviet history helpful but not required) This course explores the institutions of the Soviet system and pressures to reform this system. Examines specific changes made to the system through democratization and market reform. Compares these changes to similar transitions in other countries to assess possible twists in Russian's political future.

POLI 333 WESTERN POLITICAL THEORY 1. (3) (Prerequisite: POLI 231 or written permission of the instructor) The major themes and writers in the political theory of classical antiquity. The political ideas of Thucydides, Plato, Aristotle, and the Hellenistic philosophers will be explored through the significant texts of this period.

POLI 334 WESTERN POLITICAL THEORY 2. (3) (Prerequisite: POLI 333 or written permission of the instructor. POLI 333 should be taken before this course and POLI 433 after it) Medieval and renaissance political philosophy, from Saint Augustine to Sir Thomas More. Scholastic and neo-scholastic political thought, natural law and natural rights, as well as civic and northern humanism, republicanism and liberty. Twentieth century work on similar concepts will be used.

POLI 336 LE QUÉBEC ET LE CANADA. (3) (An ability to understand and read French is required; writing and speaking ability are not) (Not open to students who have taken QCST 336) Comment les Canadiens anglais et les Québécois se perçoivent-ils? Les différences culturelles entre les deux groupes. Les relations politiques et économiques entre les deux groupes. L'impact de la Révolution Tranquille. La place des francophones et des anglophones dans la vie collective. Les projets de réaménagement du cadre politique.

POLI 337 CANADIAN PUBLIC ADMINISTRATION. (3) (Prerequisite: at least one other course in Canadian government or politics) Organization and practice of public administration at the federal provincial and local level in Canada. Contrasting theories/techniques of public administration and policy, organization of field offices for delivery of essential public services, governments as employers, and institutional and policy changes to resolve crisis inherent in "the paradoxical view of bureaucracy".

POLI 339 COMPARATIVE DEVELOPED: TOPICS 1. (3) (Prerequisite: a basic course in Comparative Politics or written permission of the instructor) Selected aspects of politics in developed countries. Topic for 2002-03: Canada's Relations with the United States and Mexico.

POLI 340 DEVELOPING AREAS/MIDDLE EAST. (3) (Prerequisite: A basic course in Comparative Politics or a course on the region or written permission of the instructor) An examination of the societies, political forces and regimes of selected countries of the Eastern Arab world (Egypt, Syria, Lebanon, Jordan, Palestine, Saudi Arabia).

POLI 341 FOREIGN POLICY: THE MIDDLE EAST. (3) (Prerequisite: A 200- or 300- level course in International Relations or Middle East politics or permission of the instructor) An examination of the changing regional security environment and the evolving foreign

policies and relationships of Arab states in three areas - relations with non-Arab regional powers (Israel, Iran), inter-Arab relations, Great Power relations. The course will focus particularly on Egypt, Syria, Iraq and Saudi Arabia.

POLI 342 CANADIAN FOREIGN POLICY. (3) (Prerequisite: A basic course in Canadian Government and Politics or International Politics or written consent of instructor) The development and articulation of Canadian foreign policy. Theoretical approaches. The environmental setting. Historical perspectives. Trans-Atlantic linkages. The American connection. The Common Market. The United Nations. Military security. Developing relations with Asia, Africa, Latin America. Canada in global society.

POLI 345 INTERNATIONAL ORGANIZATION. (3) (Prerequisite: A basic course in International Politics or written consent of instructor) Focus on the United Nations - its performance and problems. Emphasis on two of its roles: as an agent for conflict management and as a source of pressure to redistribute values, wealth and skills.

POLI 346 AMERICAN FOREIGN POLICY. (3) (Prerequisite: POLI 244 or a course in American history) An exploration of American foreign policy from 1945 to the present. Topics to be addressed are the origins of the Cold War, deterrence, strategy and arms control, American intervention in Latin America and Vietnam, U.S. policy in the Post Cold War era - Gulf War, Haiti, Somalia, Yugoslavia and relations with Japan.

POLI 347 ARAB-ISRAEL CONFLICT, CRISIS, PEACE. (3) (Fall) (Prerequisite: 160-243 prior to 1997-98; or POLI 244) Concepts - protracted conflict, crisis, war, peace; system, subsystem; Conflict-levels of analysis; historical context; images and issues; attitudes, policies, role of major powers; Crises-Wars - configuration of power; crisis models; decision-making in 1956, 1967, 1973, 1982 crisis-wars; conflict- crisis management; Peace-Making - pre-1977; Egypt-Israel peace treaty; Madrid, Oslo, Israel-Jordan peace; prospects for conflict resolution.

POLI 349 FOREIGN POLICY: ASIA. (3) (Prerequisite: A basic course in International or Asian politics or written permission of instructor) A study of foreign policies of three Asian states - China, Japan and India. Focuses on security and economic dimensions and internal and external sources. Also covers regional cooperation in Asia.

POLI 351 CRISIS, CONFLICT AND WAR. (3) (Prerequisite: A basic course in international politics or permission of the instructor) Deals with causes and consequences of international conflict, and its two key manifestations - crisis and war. Synthesizes research from data-based and other analytical approaches.

POLI 354 APPROACHES TO INTERNATIONAL POLITICAL ECONOMY. (3) (Prerequisite: A basic course in International Relations and an introductory course in Macro Economics) The course presents theoretical approaches to understanding change in the international political economy.

POLI 357 POLITICS: CONTEMPORARY EUROPE. (3) (Prerequisite: POLI 212 or written permission of the instructor) An examination of political institutions and processes in today's Europe, concentrating on the member-states of the European Union and on the Union itself. The course is organized thematically rather than on a country-by-country basis.

● **POLI 359 TOPICS IN INTERNATIONAL POLITICS.** (3) (Prerequisites: A basic course in International Relations)

POLI 360 SECURITY: WAR AND PEACE. (3) (Prerequisite: A basic course in International Relations or written permission of the instructor) Focuses on international security and strategies of war and peace in historical and comparative frameworks. Topics include case studies of 20th century wars, conventional and nuclear strategy, and various approaches to peace.

POLI 362 POLITICAL THEORY AND INTERNATIONAL RELATIONS. (3) (Prerequisites: POLI 231, or POLI 232 and POLI 243 or POLI 244) Key contributions of political theory to the study and practice of international relations. Three prevailing theoretical traditions will be examined: realism, 'international society', and cosmopolitanism. Key practical issues to be explored from these perspectives include

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

war, humanitarian intervention, economic globalization, environment, and gender.

POLI 363 CONTEMPORARY POLITICAL THEORY. (3) (Prerequisite: POLI 231 or POLI 232) This course explores fundamental currents of thought in political philosophy. Topics will vary from year to year, and may include issues such as classical liberalism and its opponents, the foundations of socialism and Marxism, rational choice theory and its critics.

POLI 365 DEMOCRATIC THEORY. (3) (Prerequisite: POLI 231 or POLI 232 or written permission of instructor) A series of lectures and seminars on democratic theory.

POLI 366 TOPICS IN POLITICAL THEORY. (3) (Prerequisites: A basic course in Political Theory) A specific problem area in Political Theory.

● **POLI 371 CHALLENGE OF CANADIAN FEDERALISM.** (3) (Prerequisite: at least one course in Canadian politics)

POLI 378 THE CANADIAN JUDICIAL PROCESS. (3) (Fall) (Prerequisite: POLI 221 or POLI 222 or permission of the instructor) (Not open to students who took 160-379 (1990-91) or 160-427 (1989-90)) An examination of the structure of the judiciary and its role in the Canadian political process. Topics include the nature of judicial power and its constitutional framework in Canada, the structure and function of courts, judicial recruitment and personnel, judicial policy-making and the political role of the Supreme Court under the Charter of Rights and Freedoms.

POLI 379 TOPICS IN CANADIAN POLITICS. (3) (Prerequisite: A basic course in Canadian Government and Politics) Topics in Canadian politics.

● **POLI 411 IMMIGRATION AND MULTICULTURALISM IN CANADA.** (3) (Prerequisite: at least one course in Canadian politics, preferably at the 300 or 400 level, or permission of the instructor)

POLI 412 CANADIAN VOTING/PUBLIC OPINION. (3) (Prerequisite: at least one course in Canadian politics, preferably at the 300 or 400 level, or permission of the instructor) A critical examination of major debates within the literature on Canadian voting behaviour and public opinion.

POLI 414 SOCIETY AND POLITICS IN ITALY. (3) (Prerequisite: a basic course in Comparative Politics and preferably an upper level course or written permission of the Instructor) Analysis of modern Italian political development in comparison to other Western and Mediterranean countries. What makes Italian politics unique, what makes it resemble that of other countries.

● **POLI 417 HEALTH CARE IN CANADA.** (3) (Prerequisites: POLI 221 or POLI 221)

POLI 419 TRANSITIONS FROM COMMUNISM. (3) (Prerequisites: A previous History or Political Science course on the USSR, or Eastern Europe after WW II, or written permission of the instructor) Selected problems facing the Post-Soviet world. Themes include: new political institutions, parties, and groups; economic reform; social problems; ideological changes; the rise of ethnonationalism; linkages with the West.

● **POLI 422 DEVELOPING AREAS/TOPICS 2.** (3) (Prerequisites: a basic course and preferably an upper level course in comparative politics)

POLI 423 POLITICS OF ETHNO-NATIONALISM. (3) (Prerequisites: one 300 or 400-level course in comparative politics; and one 300 or 400-level course on developing areas (any discipline.) The same course can fulfill both requirements) Theories of ethno-nationalism examined in light of experience in Asia, Middle East and Africa. Topics include formation and mobilization of national, ethnic and religious identities in colonial and post-colonial societies; impact of ethno-nationalism on pluralism, democracy, class and gender relations; means to preserve tolerance in multicultural societies.

POLI 424 MEDIA AND POLITICS. (3) (Prerequisites: POLI 111 or POLI 112; and at least 3 credits in Political Science at the 300 level.) The role of media in domestic and international politics, with reference to recent studies in political science. Themes in the study of mass media and politics in developed democracies.

POLI 425 TOPICS IN AMERICAN POLITICS. (3) (Prerequisite: POLI 325) This course involves a detailed analysis of a limited area of American politics and government. Topic for 2002-03: The Supreme Court and Constitutional Law.

POLI 427 SELECTED TOPICS: CANADIAN POLITICS. (3) (Prerequisite: A basic course and preferably an upper level course as well in Canadian Government and Politics or permission of the instructor) Selected problem areas in Canada's political process, political culture, constitutional development, and machinery of government.

● **POLI 428 POLITICS OF FRANCE.** (3) (Prerequisite: POLI 211 or either POLI 211 or POLI 212 or POLI 328 or POLI 357 or written permission of the instructor)

POLI 431 NATIONS AND STATES/DEVELOPED WORLD. (3) (Prerequisite: POLI 211 or POLI 212 or POLI 328) The role of nationalism in European and North American political development. Topics include: nationalism and state-formation, secession and sub-state nationalism, war and nationalism, federal and consociational arrangements in multi-national societies.

POLI 433 HISTORY OF POLITICAL/SOCIAL THEORY 3. (3) (Prerequisite: POLI 231 or written permission of instructor) (POLI 334 should be taken before this course) Early modern political philosophy, from Luther to Rousseau and Burke. Resistance theories of the 16th century, Hobbes and Locke, the Enlightenment and the French Revolution. Twentieth century work on concepts developed in this period such as rights, revolution, legitimacy, democracy, authority and liberty.

POLI 434 HISTORY OF POLITICAL/SOCIAL THEORY 4. (3) (Recommended: POLI 231 or POLI 232 or written permission of instructor) A consideration of selected writers and themes of late 19th and 20th century political theory. Writers include Hegel, Clausewitz, Marx, Mill, Nietzsche, Lenin, Rowis, Foucault, and Habermas. The rise of industrial society, scientism, the romantic revolt, revolutionary movements, socialism and liberal-democracy.

POLI 437 POLITICS IN ISRAEL. (3) (Prerequisite: POLI 211 or POLI 212. Recommended JWST 366) An analysis of the nature and development of the Israeli political system, including historical background, Zionist ideology, the electoral system, the political parties, the institutions of government, constitutional issues, and religion and politics. The relationship between domestic politics and foreign policy will also be explored.

POLI 441 IPE: NORTH-NORTH RELATIONS. (3) (Prerequisites: At least one course in international politics) A political economy course on political and economic changes which have blurred the domestic/international distinction, making domestic issues the subject of negotiation among states. The development of the EU which reinforces this as well as the politics of firms and states, trade, money, and regulation are studied.

● **POLI 443 CHANGE IN INTERNATIONAL POLITICS.** (3) (Prerequisite: POLI 244 or POLI 243 plus POLI 301 or a 300- or 400-level course in International Relations)

POLI 444 TOPICS IN INTERNATIONAL POLITICS. (3) (Prerequisite: An upper level course in International Politics or written permission of the instructor) A specific problem area in International Politics.

POLI 445 IPE: NORTH-SOUTH RELATIONS. (3) This course examines the politics of economic relations between economically advanced, industrialized countries and the less economically developed countries in the postwar period.

● **POLI 446 LES POLITIQUES PUBLIQUES AU QUÉBEC.** (3) (Prerequisites: POLI 226 or POLI 336 or permission of the instructor) (An ability to understand and read French is required; writing and speaking ability are not) (Not open to students who have taken QCST 446 or QCST 456)

POLI 447 CANADIAN CONSTITUTIONAL POLITICS. (3) (Prerequisites: A 300-level Canadian Politics course and one of POLI 221 (Government of Canada), POLI 222 (Political Process & Behaviour in Canada), POLI 226 (La Vie Politique Québécoise) or Permission of Instructor) An analysis of the major constitutional conflicts since the adoption of the Constitution Act of 1982. The focus will be on the theories of federalism and conceptions of the political community

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

informing the specific proposals, their objectives and details, and the politics of the outcomes.

POLI 450 PEACEBUILDING. (3) (Prerequisites: previous courses in comparative politics/developing areas and international relations. Internet research skills are strongly recommended) An examination of transitions from civil war to peace, and the role of external actors (international organizations, bilateral donors, non-governmental organizations) in support of such transitions. Topics will include the dilemmas of humanitarian relief, peacekeeping operations, refugees, the demobilization of ex-combatants, transitional elections, and the politics of socio-economic reconstruction.

POLI 451 THE EUROPEAN UNION. (3) (Prerequisite: one course each in International Relations and Comparative Politics) The emergence of the EU and its innovative institutions and policies will be studied through lectures, discussions, and a simulation (of a European Council or Parliament session). Emphasis upon current debates about the EU's developing identity, its internal political economy, its institutions of 'multilevel' governance, and its external relation.

POLI 459 TOPICS IN POLITICAL THEORY. (3) (Prerequisite: An upper level course in Political theory or written permission of the instructor) This course will deal with a specific problem area in Political theory.

● **POLI 464 COMPARATIVE POLITICAL ECONOMY.** (3) (Prerequisites: At least one course in comparative politics. A basic course in economics is advised)

● **POLI 466 PUBLIC POLICY ANALYSIS.** (3)

POLI 469 POLITICS OF REGULATION. (3) (Prerequisite: POLI 221 or POLI 222 and at least one 300-level course or above in Canadian politics, or permission of instructor) Issues arising from the use of regulation as a governing instrument including origins of regulation, costs and benefits, political accountability and regulatory change including deregulation. Issues will be explored through examination of broadcasting and telecommunications regulation and their convergence in the "Information Highway".

POLI 471 DEMOCRACY IN THE MODERN WORLD. (3) (Prerequisite: A course in Comparative Politics or written permission of the instructor) Topics include competing conceptions of democracy; transitions to democratic rule; and the political, economic and social factors affecting newly established democratic regimes. Case studies are drawn from Latin America, Southern Europe and Eastern Europe, and other developing areas.

POLI 472 DEVELOPING AREAS/SOCIAL MOVEMENTS. (3) (Prerequisites: POLI 227 and an upper level course in the Politics of Developing Countries or permission of the instructor) Topics include the factors contributing to the emergence of social movements and the influence of social movements on politics. A variety of movements are examined through case studies, including peasant, labor, women's and urban poor movements.

● **POLI 473 DEMOCRACY AND THE MARKET.** (3) (Prerequisite: A course in Comparative Politics or written permission of the instructor)

POLI 478 THE CANADIAN CONSTITUTION. (3) (Winter) (Prerequisites: POLI 378 or an upper level course in Canadian Politics or permission of the instructor) (Not open to students who took 160-427 in 1989-90 or 1991) An examination of legislative and judicial protection of rights and liberties in Canada. Topics to be covered include civil rights and the division of powers; the implied bill of rights theory; the 1960 Bill of Rights; establishment and enforcement of human rights legislation; and the Charter of Rights and Freedoms.

POLI 490 INDEPENDENT READING AND RESEARCH. (3) (Fall and Winter) Final year Honours students wishing to pursue a specialized interest will be allowed to undertake a program of independent reading and/or research in that area under the supervision of a member of staff. Such programs may be undertaken by students either individually or in small groups. It is the responsibility of the student to obtain the instructor's consent prior to registration.

POLI 499 HONOURS ESSAY. (3) (Fall and Winter) (Open to Honours students only) Regular meetings between students and professors, the writing of a well researched essay and its oral defense. The essay should demonstrate some experience with primary sources, the ability to explore various theoretical perspectives as well as to organize and present a set of arguments in a systematic and thorough manner.

POLI 521 SEMINAR: CANADIAN POLITICS AND GOVERNMENT. (3) (Open to graduate students, final year Honours students, and other advanced undergraduates with the permission of the instructor) (Prerequisite: At least one 300 or 400-level course in Canadian Politics) Selected problems of Canadian socio-economic and political structures; political culture; constitutional development, and governmental structure. Topic for 2003-04: Constitutional Politics.

POLI 522 SEMINAR: DEVELOPING AREAS. (3) (Prerequisite: At least one upper level course in the politics of developing areas) (Open to graduate students, final year Honours students, and other advanced undergraduates with the permission of the instructor) A research seminar dealing with experiences of various developing countries. Examines the intersections of visions of gender and community; the interactions between mobilization along gender and community lines; the gendered nature and cultural coding of various policy initiatives. Greater emphasis given to concerns and actions of women, and to visions of community based on religion and race. Students are expected to undertake a research project. Topic for 2003-04: Power, Marginality, Resistance.

POLI 524 SEMINAR: DEVELOPED AREAS. (3) (Prerequisite: At least one upper-level course in the politics of developed areas) (Open to graduate students, final year Honours students, and other advanced undergraduates with the permission of the instructor) Topic for 2003-04: Passage to Modernity and Democratic Transformation in Comparative Perspective. Perspective.

POLI 561 SEMINAR: POLITICAL THEORY. (3) (Prerequisite: At least one upper level course in political philosophy) (Open to graduate students, final year Honours students, and other advanced undergraduates with the permission of the instructor) A topic in political philosophy such as democracy, liberty, property or nationalism, or a political philosopher, is studied to enable students to research a topic in depth, to present their papers to the seminar, and to engage in and profit from discussion and debate. Topic for 2003-04: Justice and Reconciliation.

POLI 575 SEMINAR: INTERNATIONAL POLITICS. (3) (Open to graduate students and final year Honours students only) A research seminar dealing with topics in the field of international politics. Topic for 2003-04: Domestic and International Politics of Separatism.

POLI 599 INTERNSHIP: POLITICAL SCIENCE. (3) (Fall and Winter) (Open, with permission, to final year Honours and Joint Honours students, and graduate students. This course does not count as a 500-level seminar under the Honours requirements) The internship shall consist of a minimum of 150 hours of work over a period of 12 weeks, plus a major research project based on the internship. The major project will ordinarily consist of a major research paper, plus a substantial written record of the work conducted during the internship.

QCST – Quebec Studies

Offered by: Quebec Studies Programme
Former Teaching Unit Code: 157

QCST 300 ÉTUDES SUR LE QUÉBEC. (3)

QCST 440 ASPECTS DU QUÉBEC CONTEMPORAIN/ASPECTS OF CONTEMP. QUEBEC. (3) (Cours obligatoire pour tous les étudiants(es) en Études sur le Québec. Également accessible aux étudiants(es) qui ont une connaissance de base de la société et culture québécoises, avec la permission du professeur) (Required course for all students in Quebec Studies. Open also to U2 and U3 students who have a basic knowledge of Quebec society) (Instruction, discussions, oral presentations and papers can be in French or English) L'enseignement, les discussions, les exposés et les travaux peu-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

vent se faire en français et en anglais. Le thème du séminaire change à chaque année, mais porte toujours sur une facette de la société québécoise moderne. Cours interdisciplinaire, on y étudie différents aspects: historique, sociologique, économique, politique, culturel, etc. An interdisciplinary approach from a political science angle is comparing the topic's various dimensions: historical, sociological, economical, political, cultural, etc. This seminar has a different topic each year it is given, but all topics are directly related to some important problems or phenomena in modern Quebec politics and society.

QCST 472D1 TUTORIAL/TRAVAUX DIRIGÉS. (3) (Obligatoire pour les étudiants(es) inscrit(e)s au concentration majeur en Études sur le Québec.) (Required for U3 students in completing a Major Concentration in Quebec Studies.) (Students must also register for QCST 472D2) (No credit will be given for this course unless both QCST 472D1 and QCST 472D2 are successfully completed in consecutive terms) Sous la direction du Directeur du Programme d'études sur le Québec ou d'un professeur, l'étudiant(e) choisit un sujet sur lequel il (elle) travaille pendant une année et rédige un essai d'une cinquantaine de pages. Under the supervision of either the Director of Quebec Studies Program or a professor, the student chooses a topic on which she/he works for a year and then submits an essay of approximately 50 pages.

QCST 472D2 TUTORIAL/TRAVAUX DIRIGÉS. (3) (Prerequisite: QCST 472D1) (No credit will be given for this course unless both QCST 472D1 and QCST 472D2 are successfully completed in consecutive terms) See QCST 472D1 for course description.

RUSS – Russian (Arts)

Offered by: Department of Russian and Slavic Studies
Former Teaching Unit Code: 141

RUSS 199 FYS: PATTERNS - RUSSIAN CULTURE. (3) (Fall or Winter) (Prerequisites: None) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) Exploration of cultural archetypes defining continuity and change from Peter the Great to the present; the Russian national identity, double-faith, Western and Slavophile influences, Mother Russia, superfluous men and the Eternal Feminine, anarchism, Stalinism. Interdisciplinary (literature, art, film, music, pop culture, applied arts, journalism). Research- and conference-technique seminar.

RUSS 210 ELEMENTARY RUSSIAN LANGUAGE 1. (3) (Fall) (Departmental approval required) Reading, grammar, translation, oral practice.

RUSS 211 ELEMENTARY RUSSIAN LANGUAGE 2. (3) (Winter) (Prerequisite: RUSS 210 or equivalent) (Departmental approval required) Russian Language; continuation of RUSS 210.

RUSS 215 ELEMENTARY RUSSIAN LANGUAGE INTENSIVE 1. (6) (Fall) (Departmental approval required) (Not open to students who are taking or have taken RUSS 210, RUSS 211 or equivalent) An intensive introduction to the Russian language which covers the first year of the normal level, i.e. RUSS 210/RUSS 211 in one semester. The basic grammatical structures are covered.

● **RUSS 217 RUSSIA'S ETERNAL QUESTIONS.** (3) (Permission of the instructor)

RUSS 218 RUSSIAN LITERATURE IN REVOLUTION. (3) (Winter) (Prerequisite: None, but some background in Russian 20C history is helpful) (Conducted in English) The Russian twentieth-century literary dynamic up to the watershed of Stalin's death (1953). Carving out cultural territory against ideological polemics, revolutionary versus traditional values, the explosion of avant-garde experimentation under mounting critical conformism as reflected in major works and authors (Mayakovsky, Babel, Bulgakov, Platonov and others).

RUSS 219 RUSSIAN LITERATURE IN RECOVERY. (3) (Winter) (Prerequisite: None, but some background in Russian 20C history is helpful) (Conducted in English) Rediscovering the Russian literary

heritage, both traditional and avant-garde, after Stalin's death (1953). The Thaw, Soviet beatniks, Solzhenitsyn-style dissidents against cultural iconoclasts, the challenge and decline of perestroika, raising the literary Iron Curtain to include women writers, emigres, Western influence and the angst of pluralism.

RUSS 223 RUSSIAN WRITERS - 19TH CENTURY. (3) (Fall) (Conducted in English) Designed for students interested in Russian literature and its authors. A broad overview acquainting them with the main Russian literary currents of the 19th century and with the lives and destinies of its writers.

RUSS 224 FROM WAR TO REVOLUTION. (3) (Winter) (Conducted in English) Russian literature from the Crimean War (1856) to the revolutions of 1917. The classical novel through Symbolism to the end of the Empire. Literature in an age of uncertainty. There will be an examination of the works of Tolstoy, Dostoevsky, Chekhov, Bely, Gorky and other selected authors.

RUSS 235D1 WESTERN ARMENIAN. (3) (Fall) (Please consult Department prior to registration.) (Students must also register for RUSS 235D2) (No credit will be given for this course unless both RUSS 235D1 and RUSS 235D2 are successfully completed in consecutive terms) This is an introductory course designed to cover First and Second levels in two semesters. The course aims at developing skills in speaking, reading and writing Armenian. Selective readings will be used to provide information about the civilization and culture of Armenian people.

RUSS 235D2 WESTERN ARMENIAN. (3) (Winter) (Prerequisite: RUSS 235D1) (No credit will be given for this course unless both RUSS 235D1 and RUSS 235D2 are successfully completed in consecutive terms) See RUSS 235D1 for course description.

● **RUSS 236 WESTERN ARMENIAN.** (3) (Winter) (Prerequisite: RUSS 235D1/RUSS 235D2 or knowledge corresponding to a first level course) (Please consult Department prior to registration.)

● **RUSS 255D1 INTRODUCTION TO POLISH.** (3) (Students must also register for RUSS 255D2) .

● **RUSS 255D2 INTRODUCTION TO POLISH.** (3) (Prerequisite: RUSS 255D1)

RUSS 310 INTERMEDIATE RUSSIAN LANGUAGE 1. (3) (Fall) (Prerequisite: RUSS 210 and RUSS 211 or equivalent) (Requires departmental approval) (Not open to students who are taking RUSS 316) Reading, translation, conversation.

RUSS 311 INTERMEDIATE RUSSIAN LANGUAGE 2. (3) (Winter) (Prerequisite: RUSS 310 or equivalent) (Requires departmental approval) (Not open to students who are taking or have taken RUSS 316) Reading, translation, conversation.

RUSS 316 INTERMEDIATE RUSSIAN LANGUAGE INTENSIVE 2. (6) (Winter) (Prerequisite: RUSS 215 or equivalent) (Departmental approval required) (Not open to students who have taken RUSS 310, RUSS 311 or are taking RUSS 311) Continuing the Intensive program of RUSS 215 this course covers the second year of the normal level, i.e. RUSS 310/RUSS 311, in one semester. The basic grammatical structures are covered.

RUSS 327 OUTLINES 19TH CENTURY RUSSIAN LITERATURE: ROMANTIC PERIOD. (3) (Fall) (Prerequisite: RUSS 215 or equivalent, or permission of the Department. The course will be conducted to some extent in Russian) A general introduction to Russian prose, poetry and drama in the 19th Century. Selected texts will be read in the original and discussed.

RUSS 328 OUTLINES 19TH CENTURY RUSSIAN LITERATURE: RUSSIAN REALISM. (3) (Winter) (Prerequisite: RUSS 327 or permission of the Department. The course will be conducted to some extent in Russian) A general introduction to Russian prose, poetry and drama in the 19th Century. Selected texts will be read in the original and discussed.

RUSS 330 INTRODUCTION TO SOVIET RUSSIAN LITERATURE BEFORE WWII. (3) (Fall) (Prerequisite: RUSS 215 or equivalent, or permission of the Department) (The course will be conducted mainly in Russian) Selected texts will be read in the original and discussed.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

RUSS 331 INTRODUCTION TO SOVIET RUSSIAN LITERATURE AFTER WWII. (3) (Winter) (Prerequisite: RUSS 330 or equivalent. The course will be conducted mainly in Russian) Selected texts will be read in the original and discussed.

- **RUSS 345D1 INTERMEDIATE POLISH STUDIES.** (3) (Fall) (Prerequisite: RUSS 255 or permission of the Department) (Please consult Department prior to registration.) (Students must also register for RUSS 345D2)

- **RUSS 345D2 INTERMEDIATE POLISH STUDIES.** (3) (Winter) (Prerequisite: RUSS 345D1)

RUSS 400 ADVANCED RUSSIAN LANGUAGE 1. (3) (Fall) (Prerequisite: RUSS 310 and RUSS 311 or equivalent or permission of the Department) (Conducted in Russian) Advanced practical Russian grammar and composition. May include reading a variety of texts and media from classical to contemporary (literature, newspapers, TV, film, etc.).

RUSS 401 ADVANCED RUSSIAN LANGUAGE 2. (3) (Winter) (Prerequisite: RUSS 400 or equivalent) (Conducted in Russian) Advanced practical Russian grammar and composition. May include reading a variety of texts and media from classical to contemporary (literature, newspapers, TV, film, etc.).

- **RUSS 411 DRAMA IN RUSSIAN LITERATURE AFTER 1850.** (3)

RUSS 415 ADVANCED RUSSIAN LANGUAGE INTENSIVE 1. (6) (Fall) (Prerequisite: RUSS 215/RUSS 316 or RUSS 310/RUSS 311) (Requires departmental approval) Continuing the Intensive program of RUSS 215 and RUSS 316, students will complete their study of the fundamental structure of modern literary Russian, including the morphology and syntax of the nominal and verbal systems.

RUSS 416 ADVANCED RUSSIAN LANGUAGE INTENSIVE 2. (6) (Winter) (Prerequisite: RUSS 415) (Requires departmental approval) Continuing the Intensive program of RUSS 215/RUSS 316, students will complete their study of the fundamental structure of modern literary Russian, including the morphology and syntax of the nominal and verbal systems. Besides developing an oral facility in the language, this course introduces the student to the study of literature by analysing literary texts of prerevolutionary and Soviet Russia to see the use and verbal systems, syntax, stylistic levels, historical changes.

- **RUSS 451 20TH-CENTURY RUSSIAN LANGUAGE AND LITERATURE AFTER WWII.** (3) (Winter) (Prerequisite: RUSS 450 or equivalent, or permission of the Department. Corequisite: RUSS 453 or permission of the Department) (Conducted in Russian)

RUSS 452 ADVANCED RUSSIAN LANGUAGE AND SYNTAX 1. (3) (Fall) (Prerequisite: RUSS 415 and RUSS 416 or equivalent or permission of the Department) Prose composition, translation, essay writing. An introduction to Russian stylistics.

RUSS 453 ADVANCED RUSSIAN LANGUAGE AND SYNTAX 2. (3) (Winter) (Prerequisite: RUSS 452 or equivalent) Prose composition, translation, essay writing. An introduction to Russian stylistics.

- **RUSS 455 HISTORY OF THE RUSSIAN LANGUAGE 1.** (3) (Fall) (Prerequisite: RUSS 415 and RUSS 416 or equivalent or permission of the Department) (Course given principally in Russian)

- **RUSS 456 HISTORY OF THE RUSSIAN LANGUAGE 2.** (3) (Prerequisite: RUSS 455 or equivalent) (Course given principally in Russian)

RUSS 458 DEVELOPMENT RUSSIAN NOVEL BEFORE TURGENEV. (3) (Fall) (Prerequisite: RUSS 415 and RUSS 416 or equivalent or permission of the Department) (Conducted in Russian) The development of the Russian novel before Turgenev. Reading texts will be chosen from the prose works of Karamzin, Bestuzhev, Pushkin, Lermontov, and Gogol.

RUSS 459 RUSSIAN NOVEL PUSHKIN-GOGOL. (3) (Winter) (Prerequisite: RUSS 458 or equivalent) (Conducted in Russian) The development of the Russian novel from Pushkin to Gogol. Reading texts will be chosen from the prose works of Pushkin and Gogol.

RUSS 460 RUSSIAN NOVEL 1860-1900 1. (3) (Fall) (Prerequisite: RUSS 452 and RUSS 453 or equivalent or permission of the

Department) The Golden Age of the novel in Russian Literature. The major works of Turgenev, Dostoevsky and Tolstoy will be read in the original and discussed in Russian.

RUSS 461 RUSSIAN NOVEL 1860-1900 2. (3) (Winter) (Prerequisite: RUSS 460) The Golden Age of the novel in Russian literature. The major works of Turgenev, Dostoevsky and Tolstoy will be read in the original and discussed in Russian.

- **RUSS 462 SOVIET LITERATURE: THAW - EARLY 70s.** (3) (Fall) (Prerequisite: RUSS 415, RUSS 416 or permission of Department) (Conducted mainly in Russian)

RUSS 463 SOVIET LITERATURE: EARLY 70s - PERESTROIKA. (3) (Winter) (Prerequisite: RUSS 415, RUSS 416 or Permission of Department) (Conducted mainly in Russian) Continuation of RUSS 462. Major themes in Soviet literature from the early 1970s to present. Breakdown of the doctrine of Socialist Realism and the emergence of new themes critically evaluating the Soviet past. Excerpts from selected works (Aitmatov, Grossmann, Rasputin, Rybakov, Tolstaya, Trifonov) will be read.

RUSS 465 RUSSIAN MODERNIST PROSE 1. (3) (Fall) (Prerequisite: Permission of the Department) (Conducted mainly in Russian) Russian poetry, prose, drama, the essay and other media from the Silver Age to WWI, from Chekhov to Blok and Belyi. The crisis of realism, decadence, symbolism, and its waning traced through the eternal feminine, the devil, the city, poetry as pure creation, and millennial crisis.

- **RUSS 466 RUSSIAN MODERNIST PROSE 2.** (3) (Winter) (Prerequisite: Permission of the Department) (Conducted mainly in Russian)

RUSS 470 INDIVIDUAL READING COURSE. (3) (Fall) (Prerequisite: Permission of instructor) Supervised reading under the direction of a member of staff.

RUSS 471 INDEPENDENT RESEARCH. (3) (Winter) (Prerequisite: Permission of instructor) Supervised research under the direction of a member of staff.

- **RUSS 490 HONOURS SEMINAR.** (3) (Fall) (Prerequisite: Permission of the Department) (Restricted to Honours or Joint Honours in Russian and Slavic Studies)

RUSS 491 HONOURS SEMINAR. (3) (Winter) (Prerequisite: RUSS 490) This course is intended to allow students to bring together their knowledge of the general area of Russian & Slavic Studies and produce a synthesis appropriate to their level of development. The major exercise will consist of the writing of a research paper displaying their competence.

RUSS 510 HIGH STALINIST CULTURE. (3) (Fall) (Given in English) Novels, films, art, architecture, pageantry, rhetoric and routine of the Stalinist 1930s-40s, including socialist realism as an aesthetic doctrine, utopian blueprint, target of parody, amalgam of a sub-merged avantgarde and state-controlled pop culture, precursor of the postmodernist simulacrum, self-proclaimed international style and/or uniquely Russian 20th-century project.

SOCI – Sociology (Arts)

Offered by: Department of Sociology

Former Teaching Unit Code: 166

Although students from outside the Department may take courses in the Department without having had SOCI 210 Sociological Perspectives (except where noted otherwise) nevertheless this course is recommended.

SOCI 199 FYS: TRANSITION FROM SCHOOL TO WORK. (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) An examination of the vocational preparation provided by various levels of the educational system (including adult education); the relationship between the preparation and subsequent labour market experience; and the organization of training with particular reference to

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

government training policy. International comparisons are central to the content of this course.

SOCI 210 SOCIOLOGICAL PERSPECTIVES. (3) Major theoretical perspectives and research methods in sociology. The linkages of theory and method in various substantive areas including: the family, community and urban life, religion, ethnicity, occupations and stratification, education, and social change.

SOCI 211 SOCIOLOGICAL INQUIRY. (3) (Prerequisite or Corequisite: SOCI 210) An introductory review of methods of sociological research including research design, elementary quantitative data analysis, observation, and use of official statistics. Detailed examination of published examples of the use of each of the major techniques of data analysis and collection.

● **SOCI 215 GENDER FAMILY AND SOCIAL CHANGE.** (3)

● **SOCI 216 SOCIAL PSYCHOLOGY.** (3) (Not open to students who have taken PSYC 215, PSYC 330, or MGCR 221)

SOCI 217 CANADIAN MASS COMMUNICATIONS. (3) An introduction to the history, structure and functions of the mass media in Canada and the way ownership patterns affect message content. The focus is comparative, stressing differences between the U.S. and Canada and policy interrelationships resulting from overflow programming.

SOCI 219 SOCIOLOGY OF CULTURE. (3) A survey of theoretical approaches and substantive topics in the culture. Topics include: norms and values in national cultures; negotiation of cross-cultural interpersonal exchanges; structural codes and cultural classifications; production constraints on cultural objects; the differential reception of cultural products.

SOCI 222 URBAN SOCIOLOGY. (3) Comparative analysis of the process of urbanization in Europe, North America and the Third World; effects of urbanization upon social institutions and individuals; theories of urbanization and urbanism; the Canadian urban system; urban problems in comparative view.

SOCI 225 MEDICINE AND HEALTH IN MODERN SOCIETY. (3) Socio-medical problems and ways in which sociological analysis and research are being used to understand and deal with them. Canadian and Québec problems include: poverty and health; mental illness; aging; death and dying; professionalism; health service organization.

SOCI 230 SOCIOLOGY OF ETHNIC RELATIONS. (3) (Prerequisite: SOCI 210 or permission of instructor) An introduction to the sociological study of minority groups in Canada. The course will explore the themes of racism, prejudice, and discrimination, ethnic and racial inequalities, cultural identities, multiculturalism, immigration. Theoretical, empirical, and policy issues will be discussed. While the focus will be primarily on Canada, comparisons will be made with the United States.

SOCI 234 POPULATION AND SOCIETY. (3) An introduction to population studies and techniques of demographic analysis. Demographic processes and social structures and changes. Empirical findings and the theory of the demographic transition. World patterns, selected country case studies, and Canadian population issues. Population policies, political and economic controversies.

SOCI 235 TECHNOLOGY AND SOCIETY. (3) An examination of the extent to which technological developments impose constraints on ways of arranging social relationships in bureaucratic organizations and in the wider society: the compatibility of current social structures with the effective utilization of technology.

SOCI 247 FAMILY AND MODERN SOCIETY. (3) (Course for the Women's Studies Concentrations) Contrasting family in Canada and in the United States for the recent past. Examination of theories on family; changes and diversity of family life; complex relationships among marriage, work, and family; domestic violence; various types of family experience; and the future of the family.

SOCI 250 SOCIAL PROBLEMS. (3) Contrasting theoretical approaches to social problems.

SOCI 254 DEVELOPMENT AND UNDERDEVELOPMENT. (3) Competing theories about the causes of underdevelopment in the poor

countries. Topics include the impact of geography, the population explosion, culture and national character, economic and sexual inequalities, democracy and dictatorship. Western imperialism and multi-national corporations, reliance on the market, and development through local participation, cooperation, and appropriate technology.

SOCI 265 WAR, STATES AND SOCIAL CHANGE. (3) The impact of war on society in agrarian and industrial epochs. Particular attention is given to the relationship between war and economic development, social classes, nationalism, and democratization.

SOCI 270 GENDER, FAMILY AND SOCIAL CHANGE. (3) This course explores gender and family relations from a sociological perspective, focusing on the impact of social, economic, and political changes. Topics include changing gender roles within the family and workplace, sexual relationships, gender-related child-rearing practices, youth culture, divorce, and political conflicts over gender and family related issues.

SOCI 305 SOCIALIZATION. (3) The effects of early childhood experiences upon adult personality, and the transmission of social roles and values. Topics include: social reinforcement theories, modeling theories, maternal deprivation, culture and personality studies, cognitive development and infantile sexuality. The processes of sex-role socialization.

● **SOCI 307 SOCIAL MOVEMENTS.** (3)

SOCI 309 HEALTH AND ILLNESS. (3) Health and illness as social rather than purely bio-medical phenomena. Topics include: studies of ill persons, health care occupations and organizations; poverty and health; inequalities in access to and use of health services; recent policies, ideologies, and problems in reform of health services organization.

SOCI 310 SOCIOLOGY OF MENTAL DISORDER. (3) Data and theories of mental disorders. Transcultural psychiatry, psychiatric epidemiology, stress, labelling, mental health care delivery, the family, positive mental health and the "sick" society in the framework of sociological theories of stratification, organization and social psychology.

SOCI 312 INDUSTRIAL SOCIOLOGY. (3) Focus on the responses of both workers and managers to changes in the organization and character of industrial work, taking into account the larger social and economic contexts within which those responses take place.

SOCI 315 SOCIOLOGY OF RELIGION. (3) The social determinants and consequences of religious commitment. Beliefs and practices in cross-cultural perspective. Classical theories of the social functions of religion including those of Marx, Weber and Durkheim. Religion and social class in modern society. Functional alternatives to religion.

SOCI 318 TELEVISION IN SOCIETY. (3) TV in the social communication process: a surveyor of the environment, a socializer, a definer of "public" realities and a forum of debate. Topics include: TV reporting of political and international events, differences in French/English outlooks, and the portrayal of women.

SOCI 321 WOMEN AND WORK. (3) (Course for the Women's Studies Concentrations) Focus on women's roles as workers within and outside the home. The socialization and preparation of women for adult work roles: work as housewives, labour force participation patterns, rewards within the labour force (e.g. income, status, job satisfaction), and forces which affect and change women's work role.

SOCI 326 POLITICAL SOCIOLOGY. (3)

SOCI 327 JEWS IN NORTH AMERICA. (3) Understanding of contemporary North American Jewry using findings of sociology and other social sciences. Social, cultural, and political issues of concern to the Jewish community. Specific characteristics of Jewish life in Canada, and Québec in particular, in comparison to the American Jewish experience.

SOCI 330 CLASSICAL SOCIOLOGICAL THEORY. (3) (Prerequisite: SOCI 210 or permission of instructor) Major sociological theoretical traditions are seen in their historical contexts, as the background to

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

current theoretical issues. Emphasis on Smith, Tocqueville, Marx, Durkheim, Weber and Parsons.

SOCI 333 SOCIAL STRATIFICATION. (3) The pattern, causes and consequences of social inequality. Among the inequalities considered are those of economic class, sex (gender), race, ethnicity and age. Competing theories of the causes of social inequalities are compared and assessed.

SOCI 335 SOCIOLOGY OF STATE REPRESSION. (3) (Prerequisite: SOCI 210 OR POLI 211) Survey of central theories and case studies of state repression in the developing world and Western industrialized countries. Macro-sociological analysis of state structure as well as micro-level studies of soldiers and policemen engaged in repression action.

SOCI 338 INTRODUCTION TO BIOMEDICAL KNOWLEDGE. (3) The dynamics of biomedical disciplines and specialties. Social, scientific, political and commercial aspects of biomedical research. The organization of work in clinical and fundamental research and its consequences on the choice of research topics.

SOCI 340 CURRENT PROBLEMS IN SOCIOLOGY. (3) (Prerequisite: permission of instructor. Open to U2 and U3 students only) Intended for students who are adequately prepared to undertake advanced work and have an explicit proposal to submit.

SOCI 341 CURRENT PROBLEMS IN SOCIOLOGY. (3) (Prerequisite: permission of instructor. Open to U2 and U3 students only) Intended for students who are adequately prepared to undertake advanced work and have an explicit proposal to submit.

SOCI 342 INDEPENDENT STUDY 1. (3) (Prerequisite: permission of instructor. Open to U2 and U3 students only) Intended for students who are adequately prepared to undertake advanced work and have an explicit proposal to submit.

SOCI 343 INDEPENDENT STUDY 2. (3) (Prerequisite: permission of instructor. Open to U2 and U3 students only) Intended for students who are adequately prepared to undertake advanced work and have an explicit proposal to submit.

SOCI 350 STATISTICS IN SOCIAL RESEARCH. (3) (Prerequisite: SOCI 211) (Not open to students who have taken PSYC 204, PSYC 305 or ECON 227) (Credit for other statistics courses may preclude credit for this course and conversely. Please see regulations concerning statistics courses under "General Information") This is an introductory course in descriptive and inferential statistics. The course is designed to help students develop a critical attitude toward statistical argument. It serves as a background for further statistics courses, helping to provide the intuition which can sometimes be lost amid the formulas.

SOCI 353 INEQUALITY AND SOCIAL CONFLICT. (3) Investigation of causes, processes, and outcomes of large scale social strife particularly as related to stratification systems.

SOCI 354 DYNAMICS OF INDUSTRIAL SOCIETIES. (3) (Prerequisite: SOCI 210 or any other introductory course in the social sciences) Theories of social, economic, and political change in the industrialized societies. Causes of cycles in economic growth; imperialism and war; and in ethnic, religious, and industrial conflict. Causes of long run trends in social inequality, crime, family stability, and the position of women. Comparison of North America, Europe, Russia, and Japan.

SOCI 366 SOCIAL CHANGE IN THE CARIBBEAN. (3) Similarities and differences in the development of Caribbean societies. The heritage of plantation economies. Social and economic implication of contrasting political systems. Religion and folklore in modernizing societies. Internal migration and emigration. Caribbean communities abroad.

SOCI 377 DEVIANCE. (3) Introduction to the sociological study of deviance. Emphasis on the "societal reaction" or "interactionist" approach to deviance. The correctional and causal approach towards deviance, its limitations and alternative ways to address the subject of deviance.

● **SOCI 386 CONTEMPORARY SOCIAL MOVEMENTS.** (3)

SOCI 388 CRIME. (3) An introduction to the standard data sets available and the basic issues in crime measurement. The course focuses on how social constraints, opportunities and perceived pay-offs account for the specific patterns that shape crime participation rate, degree of involvement in illicit endeavors and duration of criminal careers.

SOCI 418 HUMAN RIGHTS AND HUMANITARIANISM. (3) (Prerequisites: SOCI 210 or POLI 211) Human rights and humanitarian actors are increasingly important players in transnational and local politics. This course will study their motivations, methods of operation, and effectiveness. Whose interest do they serve - victims of war and repression, or the interests of powerful Western nations?

SOCI 420 ORGANIZATIONS. (3) (Prerequisites: SOCI 210 or SOCI 235) A survey of theories of organization with particular reference to problems of growth, technology, centralization and decentralization, and organizational environments.

● **SOCI 435 POPULAR CULTURE.** (3)

SOCI 440 CURRENT PROBLEMS. (3) (Prerequisite: permission of instructor. Open to U2 and U3 students only) Intended for students who are adequately prepared to undertake advanced work and have an explicit proposal to submit.

SOCI 442 INDEPENDENT READING AND RESEARCH. (3) (Prerequisite: permission of instructor. Open to U2 and U3 students only) Intended for students who are adequately prepared to undertake advanced work and have an explicit proposal to submit.

SOCI 443 INDEPENDENT READING AND RESEARCH. (3) (Prerequisite: permission of instructor. Open to U2 and U3 students only) Intended for students who are adequately prepared to undertake advanced work and have an explicit proposal to submit.

SOCI 444 THE SOCIOLOGY OF LABOUR FORCE. (3) (Prerequisite: SOCI 235 or SOCI 333 or SOCI 312 or ECON 306, or permission of the instructor) Competing sociological theories and empirical research on labour force functioning and the labour market. Neo-classical economics, Marxian analysis, and dual-segmented labour market approaches. Topics include: education and the job market, occupational structures, income inequalities, the geographic mobility and the socio-political consequences of work structures. Canadian materials in comparative perspective.

● **SOCI 445 READINGS: SOCIOLOGICAL THEORY.** (3) (Prerequisite: SOCI 330 or permission of instructor)

SOCI 460 RESPONSES TO SOCIAL PROBLEMS. (3) (Prerequisite: permission of instructor.) This seminar focuses on attempts to resolve social problems. There will be discussion and debate concerning policies suggested and critical examination of their potential successes and failures. The course presupposes knowledge of social problems issues obtained in 166-250. Topics include: crime and prisons; discrimination and inequality; poverty; and drug use.

SOCI 461 QUANTITATIVE DATA ANALYSIS. (3) (Prerequisite: SOCI 350) (Credit for other statistics courses may preclude credit for this course and conversely. Please see regulations concerning statistics courses under "General Information") This course blends theory and applications in regression analysis. It focuses on fitting a straight line regression using matrix algebra, extending models for multivariate analysis and discusses problems in the use of regression analysis, providing criteria for model building and selection, and using statistical software to apply statistics efficiently.

SOCI 470 TOPICS IN ECONOMIC SOCIOLOGY. (3)

SOCI 475 CANADIAN ETHNIC STUDIES SEMINAR. (3) (Open to students following the Minor Concentration in Canadian Ethnic Studies; or to students with at least nine credits, three at the 300 level, in the social sciences; or with permission of instructor) An interdisciplinary seminar focusing on current social sciences research and public policies in areas relating to Canadian ethnic studies. Topics will include ethnic and racial inequalities, prejudice and discrimination, ethnic identities and cultural expressions, the structure and organization of minority groups.

SOCI 477 REACTIONS TO DEVIANCE. (3) (Prerequisite: SOCI 377) The nature and variety of agencies that exist for the control or treat-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ment of persons designated as "deviant". The rise and conjectured fall of institutionalization as a response to deviance. Canadian materials bearing on these subjects.

SOCI 480 HONOURS PROJECT. (3) (For Sociology U3 Honours and Joint Honours students only) The Honours Project, normally in the form of a paper, provides every Honours student with the opportunity to work independently on a topic of special interest. The student works out the topic for the Honours Project through discussions with appropriate potential supervisors (aided by the Honours Adviser when necessary).

● **SOCI 485 SOCIETY, ECONOMY AND POLITY IN ITALY.** (3) (Restriction: Open to U3 students or other students with permission of instructor)

SOCI 489 GENDER, DEVIANCE AND SOCIAL CONTROL. (3) (Course for Women's Studies Concentrations) (Prerequisite: Permission of instructor) (Restriction: open to U3 students concentrating on social problems.) This seminar examines how the definition of deviance, reactions to deviance and explanations deviance are gendered. Specific topics vary from year to year.

SOCI 495 SOCIAL PROBLEMS AND CONFLICTS. (3) (Prerequisite: permission of instructor) This course explores the social construction of "social problems". It focuses on the social conflicts involved in the definition of social issues and on how and why "problems" change over time. Issues such as drinking, smoking, drug use, pornography, abortion, and homosexuality will be discussed.

SOCI 504 QUANTITATIVE METHODS 1. (3) (Prerequisites: SOCI 350 and SOCI 461 or equivalents) Analysis of quantitative information, especially in large, survey-type, data sets. Use of computer programs such as SPSS and SAS. Topics include: cross tabulations with an emphasis on multi-dimensional tables, multiple correlation and regression, and, the relationship between individual and aggregate level statistical analyses. Special reference to demographic techniques.

SOCI 505 QUANTITATIVE METHODS 2. (3) (Prerequisite: SOCI 504) Topics include: problems - and solutions - in regression analysis, models for categorical dependent variables, including logit, log-linear, and linear probability models, measurement models, structural equation models with latent variables (LISREL), and time series and panel analysis.

SOCI 510 SEMINAR IN SOCIAL STRATIFICATION. (3) (Prerequisites: SOCI 333 and SOCI 350 or equivalents) Recent theoretical and empirical developments in social stratification and inequality. The study of social class, with attention to the anomalous findings on heterogeneity in labour markets and the labour process, status attainment processes, and the socio-political and industrial attitudes of the working class. Students will prepare quantitative analysis of Canadian survey material as well as critical qualitative reviews.

SOCI 511 MOVEMENTS/COLLECTIVE ACTION. (3) A critical examination of classical and more recent approaches to the study of social movements and collective action. Discussion of: the role of grievances and interests, incentives and beliefs, conditions of breakdown and solidarity, mobilization and social control, the dynamics of collective action.

● **SOCI 515 MEDICINE AND SOCIETY.** (3) (Prerequisite: Undergraduate students require permission of instructor)

● **SOCI 516 ADVANCED PSYCHOLOGICAL SOCIOLOGY.** (3)

● **SOCI 520 MIGRATION AND IMMIGRANT GROUPS.** (3) (Prerequisite: 15 credits in the Social Sciences)

SOCI 530 SEX AND GENDER. (3) (Restriction: Open to Honours Sociology students and to Sociology Majors with the permission of the instructor) This seminar critically reviews theoretical perspectives and research on sex and gender in various domains of social life. It gives special emphasis to work which considers the meaning of gender and how it differs across time and place.

● **SOCI 535 SOCIOLOGY OF THE FAMILY.** (3) (Undergraduate students require permission of instructor)

SOCI 538 SELECTED TOPICS IN SOCIOLOGY OF BIOMEDICAL KNOWLEDGE. (3) The seminar will examine recent work in the sociology of biomedical knowledge. It will focus on the technological shaping of biomedical knowledge, i.e. on the impact of new technologies and equipments on the development of biomedical knowledge.

SOCI 540 QUALITATIVE RESEARCH METHODS. (3) (Restrictions: open to Sociology Honours students, and Sociology Major Concentration students with the instructor's permission) Qualitative methodology, mainly participant observation, structured and unstructured interviewing. Students begin a research project using these techniques and submit field notes once a week.

SOCI 545 SELECTED TOPICS. (3) This seminar is directed to the needs of individual students. It will focus on the areas of expertise of visiting Professors/Scholars. The topics covered are not included in our regular curriculum and vary from year to year.

SOCI 550 DEVELOPING SOCIETIES. (3) Comparison of alternative explanations of underdevelopment: the impact of social stratification, relations of domination and subordination between countries, state interference with the market. Alternative strategies of change: revolution, structural adjustment, community development and cooperatives. Students will write and present a research paper, and participate extensively in class discussion.

● **SOCI 560 GENDER AND ORGANIZATION.** (3) (Prerequisite: Permission of Instructor)

SOCI 565 SOCIAL CHANGE IN PANAMA. (3) (Prerequisites: SOCI 218 and SOCI 350 or equivalents.) (Corequisites: BIOL 473, ENVR 451 and ABEN 450.) (Restriction: location in Panama. Students must register for a full term in Panama.) Analysis of social change in Panama, particularly during the 20th century: demography, social and economic structures, rural and urban activities and landscapes, indigeneous peoples, the effects of the Canal and the Free Trade Zone. Focus throughout on the interaction of human society and the environment. Four field trips.

SOCI 571 DEVIANCE AND SOCIAL CONTROL. (3) This seminar focuses on how social groups enforce rules (and maintain social order) through coercion and socialization. It reviews current research and critiques key theoretical approaches to social control. Included are discussions of regulating institutions such as prisons and mental asylums, and the roles of gossip, manners and etiquettes.

SOCI 580 SOCIAL RESEARCH DESIGN AND PRACTICE. (3) (Open to U3 and graduate students) Asking researchable sociological questions and evaluation of different research designs used to answer such questions. Development of cogent research proposals, including data collection procedures. Principles, dynamics, strengths and practical limitations of research designs. Examples from recent publications.

SOCI 590 CONFLICT AND STATE BREAKDOWN. (3) (Open to graduate students in Sociology, Political Science, Anthropology, and History AND undergraduate students with permission of instructor.) Survey of central theories of ethnic conflict, state breakdown, and warlordism in the developing world. Emphasis on the conflicts of the 1990s in Africa, the former Soviet Union and the Balkans.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

SSMD – Social Studies of Medicine

Offered by: Department of Social Studies of Medicine (Faculty of Medicine)

Former Teaching Unit Code: 527

SSMD 199 FYS: MIND-BODY MEDICINE. (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Limit 25 students) Health is influenced by biological, psychological and social factors. The interaction between these determinants in the onset, course and recovery from a variety of diseases (e.g. AIDS) will be highlighted. Students will select one phase of a particular illness (e.g. remission following breast cancer treatment) and explore the related biopsychosocial factors.

- **SSMD 400 INTERDISCIPLINARY SEMINAR.** (3)

SWRK – Social Work

Offered by: School of Social Work

Former Teaching Unit Code: 407

Several Social Work courses are open to non-Social Work students. An updated list is available from the Social Work General Office.

SWRK 199 FYS: SOCIAL WORK PROFESSION. (3) (Fall) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) The course will explore the profession and practice of social work including its history; ethical foundations and place in society. It will also address the various fields in which social workers practice - eg. health; child welfare; women's issues.

SWRK 240 INTRODUCTION TO SOCIAL WORK. (3) (Fall) (Limited to B.S.W. U1 students) Frameworks for understanding the personal and subjective predicaments of selected client populations e.g. the elderly, the urban poor, single-parent families, children at risk, people with disabilities. Examination of social legislation and social services. Introduction to social work practice concepts and methods.

SWRK 255 INTRODUCTION TO PRACTICUM. (3) (Winter) (Limited to B.S.W. U1 students) (Prerequisite: SWRK 240) A compulsory interviewing skills laboratory for all U1 social work students. Student participation essential. Communication exercises are built in. Held in conjunction with a 4-hour weekly volunteer assignment.

- **SWRK 340 INTEGRATIVE SEMINAR.** (3) (Fall and Winter) (Prerequisite: SWRK 240 and SWRK 255 or SWRK 350 and SWRK 353. Corequisite: SWRK 355) (Limited to B.S.W. U2 students)

- **SWRK 340D1 INTEGRATIVE SEMINAR.** (1.5) (Students must also register for SWRK 340D2)

- **SWRK 340D2 INTEGRATIVE SEMINAR.** (1.5) (Prerequisite: SWRK 340D1)

SWRK 341 INTRODUCTION: PRACTICE WITH FAMILIES. (3) (Winter) An introduction to theories and techniques of family assessment and intervention using genograms, family systems and eco-systemic approaches and family life cycle theory. The effects of class, gender, race, culture; also diverse family forms (nuclear, extended, divorcing, reconstituted, substitute, lone parent, gay/lesbian) are considered. Illustrations using simulations and tapes.

SWRK 344 ANTI-OPPRESSION SOCIAL WORK PRACTICE. (3) (Winter) (Limited to B.S.W. students) This course will examine alternative practice models based on the theoretical principles of anti-oppression social work, where oppressions such as racism, heterosexism/homophobia, classism, sexism and ableism, are understood to intersect at individual, institutional and systemic levels. Of special interest are issues of access and equity in human services.

SWRK 350 SOCIAL WORK SKILLS LABORATORY. (3) (Summer) (Limited to Special B.S.W. Students)

SWRK 352 PUBLIC SOCIAL SERVICES IN CANADA. (3) (Fall) (Limited to B.S.W. U1 and Special B.S.W. students) An introduction to public social services programs in effect in Canada, with emphasis on Quebec, in the fields of income and health care. Policy issues surrounding the programs are raised.

SWRK 353 INTRODUCTION TO PRACTICE. (6) (Summer) (Corequisite: SWRK 350) (Limited to Special B.S.W. students only)

SWRK 354 SOCIAL WORK IN THE HEALTH FIELD. (3) (Winter) (Limited to Social Work students) (Not open to B.S.W. U1 students) An introduction to health and health institutions in the context of service delivery. Major themes will include: multidisciplinary teamwork in the hospital; crisis intervention; legal ethical issues; and emerging issues for social workers in health.

SWRK 355 FIELD PRACTICE 1. (3) (Fall and Winter and Summer) (Prerequisite: Introductory U1 and Special B.S.W. courses) (Limited to B.S.W. U2 and Special B.S.W. students) Supervised educational experiences in social work practice designed to integrate practice and theory.

SWRK 356 FIELD PRACTICE 2. (3) (Fall and Winter and Summer) (Prerequisite: SWRK 355) (Limited to B.S.W. U2 and Special B.S.W. students) Supervised educational experiences in social work practice designed to integrate practice with theoretical knowledge.

SWRK 357 LEGAL PROBLEMS OF THE POOR. (3) (Winter) (Limited to B.S.W. U1 students) Law and social welfare, with emphasis on the socio-legal problems and rights of the poor. Methods of legal protection and redress. Aspects of Canadian civil and criminal law.

SWRK 374 COMMUNITY DEVELOPMENT/SOCIAL ACTION. (3) (Fall) (Not Open To U1 Level Students.) The organizing process and development of direct organizing skills. Emphasis on organizational entities, community power and conflict, organizing strategies and their application, urban community development.

SWRK 376 SOCIAL WORK PRACTICE WITH GROUPS. (3) (Fall) (Prerequisite: U1 required Social Work course) (Limited to B.S.W. students only) Theory and practice of work with groups. Emphasis on understanding group concepts and group dynamics and learning about various theoretical models of social group work practice. Focus on group development theory and the skills of the worker in a small group context. Small group participation, role playing and simulations will be utilized.

SWRK 377 WOMEN'S ISSUES IN PRACTICE. (3) (Winter) (Limited to B.S.W. U2, B.S.W. U3, Special B.S.W. and U3 Women's Studies Major/ Minor Concentration students) Social work practice with women based on recent advances in understanding women's relationships to the structures and institutions of society. Issues which arise in the provision of social services: women and the family, mental and physical health, poverty and the welfare system, feminist counselling.

SWRK 400 POLICY AND PRACTICE FOR REFUGEES. (3) (Fall and Summer) (Limited to B.S.W. U3 level students, and U3 non-Social Work students) Refugee-generating conflicts, international and national responses are considered. Canadian policy, history and response to refugees are analyzed. Theory-grounded practice with refugees is examined, including community organizing and direct service delivery to individuals and families.

SWRK 401 SOCIAL WORK RESEARCH. (3) (Winter) (B.S.W. U3 and Special B.S.W. students only) This course examines the kinds of research questions found in social work, the stages of the problem-solving process, and some methods commonly employed to address such questions. The course also aims to locate research, as a "way of knowing", into a broader debate on methodology.

SWRK 402 DEVELOPMENTAL DISABILITIES. (3) (Winter) (Limited to U2 and U3 level students) This course provides an in-depth analysis of social work's response to persons with a developmental disability. Students will review both the practice and the policy considerations that pertain to the field of developmental disabilities with a

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

special emphasis on the effects of deinstitutionalization and the community response.

SWRK 403 ASSESSMENT - CLINICAL AND COMMUNITY. (3) (Winter) (Limited to B.S.W. U2, B.S.W. U3 and Special B.S.W. students only.) (Prerequisite: SWRK 240) Social work assessment is the crucial professional activity on which all interventions, clinical and community, are based. This course will address relevant factors involved in the situations faced by social work practitioners and their clients as they attempt to collaboratively solve problems.

SWRK 420 ADVANCED FIELD PRACTICE 1. (3) (Fall and Winter and Summer) (Prerequisite: SWRK 355 and SWRK 356) (Limited to B.S.W. U3 and Special B.S.W. students) Supervised educational experience in social work practice at an advanced level.

SWRK 421 ADVANCED FIELD PRACTICE 2. (3) (Fall and Winter and Summer) (Prerequisite: SWRK 420) (Limited to B.S.W. U3 and Special B.S.W. students) Supervised educational experience in social work practice at an advanced level.

SWRK 434 PRACTICE WITH INVOLUNTARY CLIENTS. (3) (Winter) (Limited to B.S.W. U3 and Special B.S.W. students) Issues and practice problems encountered with involuntary clients in settings such as courts, youth protection agencies and total institutions. Topics include: reaction of the client and worker to the "involuntary" situation, the ethics and efficacy of "coerced treatment" and practice interventions with involuntary clients. Students draw on their own experience with these issues.

SWRK 438 DRUG ADDICTION AND SOCIETY. (3) (Fall or Winter) (Limited to B.S.W. U3 and Special B.S.W. Students) This course examines primarily the abuse in our society of illegal drugs e.g. heroin, cocaine and marijuana, and the abuse of prescription drugs, e.g. tranquilizers and narcotics. Topics include: assessment and treatment; I.V. drug use and the spread of the HIV virus; Canada's policy on illegal drugs.

● **SWRK 451 RETHINKING CHILD WELFARE.** (3) (Fall or Winter) (Limited to B.S.W. U3 students)

SWRK 458 SOCIAL POLICY AND ADMINISTRATION. (3) (Fall and Summer) (Prerequisite: SWRK 352) (Limited to B.S.W. U3 and Special B.S.W. students) An analysis of the administrative structures and dynamics of social service organizations, with special attention to Québec policies and to the role of social workers. Examples are drawn from current field experiences of students.

SWRK 459 ADULT/CHILD SEXUAL RELATIONS. (3) (Limited to B.S.W. U3 and Special B.S.W. students) An examination of intra/extra-familial child sexual abuse with a focus on the individual and family psychodynamics, the legal systems that respond to the problem and on assessment and treatment skills.

SWRK 463 PRACTICE WITH THE ELDERLY. (3) (Fall) (Limited to B.S.W. U2, B.S.W. U3, Special B.S.W. and U3 non-B.S.W. students) An introduction to social services to the aged. The involvement of the social worker with respect to: institutionalizing the elderly, community care, economics and aging, widowhood, separation and loss, the family situation of the elderly, and the strengths of older people.

SWRK 465 SCHOOL SOCIAL SERVICES. (3) (Winter) (Limited to B.S.W. students) (Not open to U1 students) Introduction to models of school social work practice. Diagnostic and practice approaches places emphasis on the relationships between the school, family, community and the pupil. Problems which affect the school social worker include: youth protection, children with special needs, drop-outs, conduct-disordered behaviour, integration of immigrants and violence.

● **SWRK 467 APPROACHES TO COMMUNITY PRACTICE.** (3) (Limited to U3 level students. Non-Social Work students are expected to have relevant field experience)

SWRK 471 TUTORIAL IN SOCIAL WORK RESEARCH. (3) (Fall and Winter and Summer) (Prerequisite: SWRK 401 or equivalent.) (Limited to B.S.W. U3 and Special B.S.W. students) Opportunity for interested students to conduct a small-scale practical research project, either individually or in a small group, with tutorial assistance from staff members.

SWRK 472 FAMILY ASSESSMENT. (3) (Fall) (Limited to B.S.W. U3 and Special B.S.W. students) An opportunity to participate in a seminar focusing on an integrative model of work with families. Concurrent field practice with families required.

SWRK 473 INDIVIDUALS AND FAMILIES IN CRISIS. (3) (Limited to B.S.W. U3 and Special B.S.W. students) Theory and practice of work with individuals and families under stress. Topics include: categories of hazardous events; affective, behavioural and role disorderization; phases in the crisis cycle; techniques of crisis intervention and abatement.

● **SWRK 478 PROFESSIONAL PRACTICE ISSUES.** (3) (Limited to B.S.W. U3 and Special B.S.W. students)

SWRK 481 GOAL DIRECTED TIME LIMITED PRACTICE. (3) (Fall) (Limited to B.S.W. U3 and Special B.S.W. students) Principles of goal directed time limited casework with individuals, couples and families. Relevant theory will be examined and applied to practice drawing upon examples from the students' field experiences. Emphasis on goal setting, contracting, use of tasks, evaluation of practice.

SWRK 482 MENTAL HEALTH AND ILLNESS. (3) (Winter) (Limited to B.S.W. U3 and Special B.S.W. students) An overview of practice in the field of mental health and illness, as a base for practicums in related settings. Content includes basic understanding of mental illness, its impact on patients of all ages and their families, current approaches to prevention and treatment, cultural and ethical issues, and future orientations.

SWRK 485 TUTORIAL: SOCIAL WORK PRACTICE. (3) (Fall and Winter and Summer) (Limited to B.S.W. U3 and Special B.S.W. students.) An individual or small group tutorial in which students will work independently in conjunction with the instructor. The student will undertake a project related to the area of specialization.

SWRK 486 TUTORIAL IN SOCIAL POLICY. (3) (Fall and Winter and Summer) (Limited to B.S.W. U3 and Special B.S.W. students.) An individual or small group tutorial in which students will work independently in conjunction with the instructor. The student will undertake a project related to the area of specialization.

SWRK 492 VIOLENCE AGAINST WOMEN AND CHILDREN. (3) (Winter) (Limited to B.S.W. U3, Special B.S.W., and Women's Studies Major/Minor Concentration students) Through a feminist theoretical lens, this course examines a range of male-perpetrated sexual and physical abuses of women and children. Such an examination includes critical appraisals of "common knowledge", research findings, dominant modes of intervention, and social welfare policies and legislation.

SWRK 493 SEMINAR ON CHILD PROTECTION. (3) (Fall) (Limited to B.S.W. U3 and Special B.S.W. students) The field of child protection and the problems of physical and sexual abuse and neglect of children. The general characteristics of this vulnerable population group and their families as well as some models of intervention.

SWRK 497 CLINICAL PRACTICE SEMINAR 1. (3) (Limited to B.S.W. U3 and Special B.S.W. students) Practice competence with various population groups: physically and mentally handicapped, terminally-ill, multi-problem families. Topics may change from year to year.

SWRK 498 CLINICAL PRACTICE SEMINAR 2. (3) (Fall) (Limited to B.S.W. U2, B.S.W. U3, Special B.S.W. and U3 non-B.S.W. students) Practice competence with various population groups. Topics may change from year to year.

● **SWRK 530 SOCIAL PERSPECTIVES ON AGING 1.** (3) (Limited to U3 and M.S.W. students)

● **SWRK 531 SOCIAL PERSPECTIVES ON AGING 2.** (3) (Summer) (School of Social Work: Limited to U3 and M.S.W. students)

SWRK 532 INTERNATIONAL SOCIAL WORK. (3) (Winter) (Limited to B.S.W. U3, Special B.S.W. and M.S.W. students) Discussion based upon intensive study and reports on problems in selected countries. Emphasis on identifying major social problems, understanding the social forces bearing on those problems and considering appropriate professional approaches to aid in their solution.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

SWRK 539 CHRONIC AND TERMINAL ILLNESS. (3) (Winter) (Limited to B.S.W. U3, Special B.S.W. and M.S.W. students) A seminar to examine practice with persons living with chronic and terminal illnesses. Needs of families, caretakers, health care workers and the gay community are studied.

WMST – Women's Studies

Offered by: Arts - Dean's Office
Former Teaching Unit Code: 163

WMST 200 INTRODUCTION TO WOMEN'S STUDIES. (3) An introduction to the interdisciplinary field of Women's Studies from historical and contemporary perspectives, this course will explore key concepts, issues and modes of analysis based on the intersection of gender with factors such as race, ethnicity, class, religion, and sexuality.

- **WMST 301 WOMEN'S STUDIES CURRENT TOPICS 1.** (3) (Prerequisite: WMST 200 or PHIL 242 or permission of instructor)

- **WMST 302 WOMEN'S STUDIES CURRENT TOPICS 2.** (3) (Prerequisite: WMST 200 or PHIL 242 or permission of instructor)

WMST 303 FEMINIST THEORY AND RESEARCH. (3) (Prerequisite: WMST 200) (Restriction: Open to Women's Studies students only) This course explores contemporary feminist theories and critiques of approaches to knowledge developed in the humanities, social, natural, and applied sciences. Feminist contributions to research and critical practices will be examined in relation to course projects.

- **WMST 401 WOMEN'S STUDIES SPECIAL TOPICS 1.** (3) (Prerequisite: WMST 200 or PHIL 242 or permission of instructor)

- **WMST 402 WOMEN'S STUDIES SPECIAL TOPICS 2.** (3) (Prerequisite: WMST 200 or PHIL 242 or permission of instructor)

WMST 461 TUTORIAL IN WOMEN'S STUDIES 1. (3) (Prerequisite: WMST 303 or permission of instructor) (Restriction: Majors, Honours and Joint Honours students in Women's Studies) Advanced reading course and independent research project under the supervision of an instructor on aspects of Women's Studies.

WMST 462 TUTORIAL IN WOMEN'S STUDIES 2. (3) (Prerequisite: WMST 303 or permission of instructor) (Restriction: Majors, Honours and Joint Honours students in Women's Studies) Advanced reading course and independent research project under the supervision of an instructor on aspects of Women's Studies.

WMST 495D1 HONOURS/JOINT HONOURS COLLOQUIUM. (1.5) (Prerequisite: WMST 303. Corequisite: WMST 496D1.) (Restriction: Honours/Joint Honours students in Women's Studies) (Students must also register for WMST 495D2) (No credit will be given for this course unless both WMST 495D1 and WMST 495D2 are successfully completed in consecutive terms) Students will research, discuss, and present their thesis topics.

WMST 495D2 HONOURS/JOINT HONOURS COLLOQUIUM. (1.5) (Prerequisite: WMST 495D1) (No credit will be given for this course unless both WMST 495D1 and WMST 495D2 are successfully completed in consecutive terms) See WMST 495D1 for course description.

WMST 496D1 HONOURS THESIS. (3) (Restriction: Honours students in Women's Studies.) (Students must also register for WMST 496D2.) (No credit will be given for this course unless both WMST 496D1 and WMST 496D2 are successfully completed in consecutive terms.) Supervised reading and preparation of an Honours Thesis under the direction of a member of staff.

WMST 496D2 HONOURS THESIS. (3) (Prerequisite: WMST 496D1) (No credit will be given for this course unless both WMST 496D1 and WMST 496D2 are successfully completed in consecutive terms.) See WMST 496D1 for course description.

WMST 497D1 JOINT HONOURS THESIS. (1.5) (Prerequisite: WMST 303) (Corequisite: WMST 495D1) (Students must also register for WMST 497D2) (No credit will be given for this course unless both WMST 497D1 and WMST 497D2 are successfully completed in consecutive terms) Supervised reading and preparation of a Joint Honours thesis under the direction of a member of staff.

WMST 497D2 JOINT HONOURS THESIS. (1.5) (Prerequisite: WMST 497D1) (Corequisite: WMST 495D2) (No credit will be given for this course unless both WMST 497D1 and WMST 497D2 are successfully completed in consecutive terms) See WMST 497D1 for course description.

May also be available as WMST 497N1 and WMST 497N2

WMST 498 SEMINAR ON WOMEN'S STUDIES 1. (3) An interdisciplinary seminar on topics of common interest to the area of Women's Studies.

- **WMST 499 SEMINAR ON WOMEN'S STUDIES 2.** (3)

- **WMST 501 ADVANCED TOPICS 1.** (3) (Prerequisite: WMST 303 or permission of instructor)

WMST 502 ADVANCED TOPICS 2. (3) (Prerequisite: WMST 303 or permission of instructor) Advanced topics in theory and methodology related to Women's Studies. Topics will vary from year to year. Topic for 2002-03: Introduction to Gender-based Analysis: Engendering Change. Students will explore the origins of gender-based analysis, the evolution of terminology and feminist critiques of the engagement of women with the state. Using case studies, students will learn to do and evaluate gender-based analysis in selected policy areas (including health, development, education etc.).

WMST 513 GENDER, RACE AND SCIENCE. (3) This course is a philosophical exploration of the nature of science concerning sex, gender, race and racial stereotypes, and the construction of "womanhood". The social history/biography of women and minorities in science will be studied to develop a critique of biological determinism and explore the meaning and possibility of a "feminist science".

Faculty of Education

EDEA – Arts Education

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Codes: 424 Education in Drama;
426 Education in the Arts; 429 Education in Music

- ▲ **EDEA 201 BASIC MUSICIANSHIP TEACHING 1.** (3) (Offered through Distance Education)

- ▲ **EDEA 204 DRAWING.** (3) Development of sound drafting skills through the study of organic forms and the human figure in various media.

- ▲ **EDEA 205 PAINTING 2.** (3) (Prerequisite: EDEA 204) Investigation of color, media, tools, techniques. Studies of natural forms, the human figure.

EDEA 206 1ST YEAR PROFESSIONAL SEMINAR. (1) (Corequisite: EDFE 205) This seminar along with First Year Field Experience Music serves as an orientation to the culture of the school and to teaching as a profession. Emphasis is on the general functioning of elementary and secondary schools. Topics include the role of the arts in the curriculum.

EDEA 207 2ND YEAR PROFESSIONAL SEMINAR. (1) (Prerequisites: EDEA 206 and EDFE 205. Corequisite: EDFE 206) This seminar continues the process of developing a professional identity. Topics include strategies for accommodating individual differences, coaching and tutoring individuals and small groups, peer teaching and tutoring, the role of the arts in the curriculum, differences and similarities in teaching music and teaching other subjects.

- ▲ **EDEA 241 BASIC ART MEDIA FOR CLASSROOM.** (3) An introduction to media that can be easily adapted to elementary classroom studio exploration.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

▲ **EDEA 242 CULTURAL SKILLS.** (3) Development of First Nations and Inuit skills and knowledge in art, music, handicrafts or other areas both modern and traditional. Topics will vary and be chosen from a range identified by classroom teachers. Course may continue over several training sessions.

□ ▲ **EDEA 296 BASIC DESIGN.** (3) Exploration of the basic elements of visual art through two dimensional composition and three-dimensional constructions. Investigation of materials and tools and the processes of manipulating and relating materials.

● * **EDEA 301 FOUNDATIONS OF EDUCATION IN THE ARTS.** (3) (Offered through Distance Education)

● □ ▲ **EDEA 302 SPECIAL TOPICS.** (3)

● □ ▲ **EDEA 303 MUSICIANSHIP FOR TEACHERS 2.** (3) (Offered through Distance Education) (Prerequisites: EDEA 201 or EDEA 214 and permission of instructor)

□ ▲ **EDEA 304 PAINTING 3.** (3) (Prerequisite: EDEA 205) Continuation of course EDEA 205 with emphasis on drawing and structure.

□ ▲ **EDEA 305 PAINTING 4.** (3) Continuation of course EDEA 304 with emphasis on advanced composition.

EDEA 306 3RD YEAR PROFESSIONAL SEMINAR. (2) (Prerequisites: EDEA 207 and EDFE 206. Corequisite: EDFE 305) This seminar emphasizes classroom management in the elementary classroom and the development of strategies for teaching music to large groups; critical examination of the school, the program, the teacher and the student body and how these elements converge in the elementary classroom.

● □ ▲ **EDEA 307 DRAWING 2.** (3) (Prerequisite: EDEA 204)

● □ ▲ **EDEA 314 INSTRUMENTS IN THE CLASSROOM.** (3) (The ability to read notation is not a prerequisite)

□ † **EDEA 332 ART CURRICULUM AND INSTRUCTION - ELEMENTARY.** (3) An introduction to theories on children's visual expression and perception, lesson planning, and classroom-oriented studio practice.

● □ ▲ **EDEA 341 LISTENING FOR LEARNING.** (3) (Offered through Distance Education) (The ability to read notation is not a prerequisite)

□ † **EDEA 342 CURRICULUM AND INSTRUCTION IN DRAMA EDUCATION.** (3) Pedagogical theory and practical applications in the teaching of developmental drama, dramatic forms, improvisation and theatre arts.

● **EDEA 343 ART CURRICULUM AND INSTRUCTION FOR ART MAJORS.** (3)

□ † **EDEA 345 MUSIC CURRICULUM AND INSTRUCTION FOR GENERALISTS.** (3) Study of materials and instructional techniques grounded in an understanding of basic musical concepts and contemporary theories of music teaching and learning. Definition of musical objectives and rationales, selection and development of materials, review of MEQ guidelines. Participation through singing, movement, listening, discussion and lesson planning and implementation.

● ▲ **EDEA 352 MUSIC LISTENING IN EDUCATION.** (3)

□ ▲ **EDEA 362 MOVEMENT, MUSIC AND COMMUNICATION.** (3) Coordination of musical perception and movement and development of communication skills that arise from this combination. Structured and improvised eurhythmic activities are used to explore the relationship between time, space and energy. Classroom applications are explored. No formal music training is required.

● □ ▲ **EDEA 394 CREATIVE DRAMATICS FOR CLASSROOM.** (3) (Offered through Continuing Education) A participatory course in creative drama and the use of improvisational techniques in the pursuit of student development.

□ ▲ **EDEA 396 SPEECH IN DRAMA EDUCATION.** (3) (Offered through Continuing Education) A study of the elements of voice production in teaching public speaking and drama, including training activities to develop the voice in speech and drama. Theoretical

aspects of the structure and functioning of the voice and speech mechanism are included.

□ ▲ **EDEA 404 PAINTING 5.** (3) (Prerequisite: EDEA 305) Major problems in graphic expression. A tutorial course where the student selects the instructor. Individual conferences and criticism leads the student to an independent approach to painting.

□ ▲ **EDEA 405 PAINTING 6.** (3) (Prerequisite: EDEA 404) The student will be required to work in a variety of sizes up to mural painting. Exploration of selected media and new dimensions of design.

EDEA 406 4TH YEAR PROFESSIONAL SEMINAR. (2) (Prerequisites: EDEA 306 and EDFE 305. Corequisite: EDFE 405) Continuation of topics from Third Year Professional Seminar Music with emphasis on philosophical issues of music teaching at the secondary level.

● **EDEA 407 FINAL YEAR PROFESSIONAL SEMINAR MUSIC.** (3) (Corequisite: EDEA 407.) (Restriction: Students in B.Ed. in Music or Concurrent B.Ed./B.Mus.)

□ **EDEA 410 AESTHETICS AND ART FOR THE CLASSROOM.** (3) The course is designed to address the need for teachers to be able to lead students to increased perceptual awareness and critical thinking in relation to their visual environment. Museum visits are a regular component of this course.

* † **EDEA 442 ELEMENTARY MUSIC CURRICULUM AND INSTRUCTION.** (3) Preparation for Third Year Field Experience. Includes the study of curriculum content and instructional approaches, classroom management issues, lesson planning and program development for elementary schools.

* † **EDEA 472 SECONDARY MUSIC CURRICULUM AND INSTRUCTION.** (3) Preparation for Fourth Year Field Experience. Includes the study of curriculum content and instructional approaches, classroom management issues, lesson planning and program development for secondary schools.

● **EDEA 492 DRAMA/PLAY PRODUCTION IN EDUCATION.** (3) (Prerequisites: one or more of the following, or the permission of the instructor: EDEA 394, EDEA 494, ENGL 269)

● □ ▲ **EDEA 494 IMPROVISATIONAL THEATRE ARTS FOR CLASS.** (3) (Prerequisite: EDEA 394)

□ ▲ **EDEA 496 SCULPTURE 1.** (3) (Offered through Continuing Education) An investigation of basic sculpture methods and concepts with a view toward developing personal aptitudes. Development of three-dimensional thinking through direct experience with processes using new and traditional materials.

● □ ▲ **EDEA 497 SCULPTURE 2.** (3) (Prerequisite: EDEA 496)

EDEC – Curriculum and Instruction

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Code: 455

▲ **EDEC 200 INTRODUCTION TO INUIT STUDIES.** (3) An introductory survey of Inuit history, language and culture, and of the social and political issues affecting contemporary Inuit life.

EDEC 201 FIRST YEAR PROFESSIONAL SEMINAR. (1) (Corequisite: EDFE 200) (Open to B.Ed. Secondary and B.Ed. K/Elem. students only) This seminar in conjunction with the field experience serves as an orientation to the culture of the school and to teaching as a profession. The focus of the seminar is on the general functioning of schools.

▲ **EDEC 202 EFFECTIVE COMMUNICATION.** (3) (Not open to students who have taken EDES 201, EDEC 203, EDEC 204, EDEC 205 or EDEC 206) (Offered through Continuing Education) (Note that Arts students are allowed 6 credits in writing courses and may only take an EC course before EFRL 250.) A course designed to help students develop the quality and effectiveness of their writing and speaking (in English) in a variety of academic disciplines and professional situations. Emphasis is on identifying, analyzing, and solving writing and speaking problems.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

▲ **EDEC 203 COMMUNICATION IN EDUCATION.** (3) (Restricted to Education students who have not taken EDES 201 or EDEC 202) (Because this course uses a workshop format, attendance at first class is desirable.) Written and oral communication in Education (in English): emphasis on strategies for identifying, analyzing and solving writing and speaking problems. Course work based on academic and professional communication in education, with a particular focus on classroom communication.

EDEC 204 COMMUNICATION IN SOCIAL WORK. (3) (Restricted to Social Work students who have not taken EDES 201 or EDEC 202) (Because this course uses a workshop format, attendance at first class is desirable.) Written and oral communication in Social Work (in English): emphasis on strategies for identifying, analyzing and solving writing and speaking problems. Course work based on academic and professional communication in social work.

EDEC 205 COMMUNICATION IN MANAGEMENT 1. (3) (Placement test required) (Restricted to B.Com. students who have not taken EDES 201 or EDEC 202) (Because this course uses a workshop format, attendance at first class is desirable.) (Continuing Education: requirement for for the EA, AAC, and the Canadian Institute of Management) Written and oral communication in Management (in English): emphasis on strategies for identifying, analyzing and solving writing and speaking problems. Course work based on academic and professional communication in management.

EDEC 206 COMMUNICATION IN ENGINEERING. (3) (Limited enrolment) (Restricted to B.Eng. students who have not taken EDES 201 or EDEC 202) (Because this course uses a workshop format, attendance at first class is desirable.) Written and oral communication in Engineering (in English): strategies for generating, developing, organizing, and presenting ideas in a technical setting; problem-solving; communicating to different audiences, editing and revising; and public speaking. Course work based on academic, technical, and professional writing in engineering.

● **EDEC 207 COMMUNICATION IN PUBLIC RELATIONS.** (3) (Restriction: Students in Public Relations Management Certificate only.)

EDEC 220 CURRICULUM DEVELOPMENT. (3) This course, introducing Aboriginal educators to the principles and processes of curriculum development, emphasizes the impact of language and culture on the development of materials. Features of the process of curriculum and materials design, which are strategically important in meeting the needs of Aboriginal students, are highlighted.

EDEC 221 LEADERSHIP AND GROUP SKILLS. (3) (Restriction: Normally for students registered within Certificate in First Nations and Inuit Educational Leadership) Management, effective team leadership, group dynamics, and communications skills crucial to First Nations and Inuit community-based educational leaders. Differences between traditional and mainstream institutional practices and leadership skills.

EDEC 222 PERSONNEL MANAGEMENT AND SUPPORT. (3) (Restriction: Normally for students registered within Certificate in First Nations and Inuit Educational Leadership.) Methods of appropriate and supportive supervision in a First Nations and Inuit educational milieu. Techniques of developing staff members' potential through staff development and quality performance. A compulsory practicum component will demonstrate students' transfer of theory to practice.

● ▲ **EDEC 234 ALGONQUIN SECOND LANGUAGE 2.** (3) (Prerequisite: EDEE 293)

● ▲ **EDEC 236 MOHAWK SECOND LANGUAGE 2.** (3) (Prerequisite: EDEE 296)

● ▲ **EDEC 237 MI'KMAQ SECOND LANGUAGE 1.** (3)

● ▲ **EDEC 238 MI'KMAQ SECOND LANGUAGE 2.** (3) (Prerequisite: EDEC 237)

● ▲ **EDEC 239 MI'KMAQ LANGUAGE 1.** (3)

● ▲ **EDEC 240 MI'KMAQ LANGUAGE 2.** (3) (Prerequisite: EDEC 239)

▲ **EDEC 241 CREE LANGUAGE 1.** (3) Students will learn their own phonology and see how the phonological system is reflected in dia-

lects. They will learn the spelling rules and develop their literacy skills in syllabics. Finally, they will derive Cree grammatical terms and begin to study Cree morphology and syntax.

● ▲ **EDEC 242 CREE LANGUAGE 2.** (3) (Prerequisite: EDEC 241)

● **EDEC 243 TEACHING: MULTIGRADE CLASSROOMS.** (3)

● ▲ **EDEC 244 ISSUES IN ABORIGINAL EDUCATION.** (3)

● **EDEC 245 MIDDLE SCHOOL TEACHING.** (3)

● **EDEC 246 MIDDLE SCHOOL CURRICULUM.** (3) (Prerequisite: EDEC 245)

EDEC 300 SPECIAL TOPICS 1. (3) (Offered through Continuing Education) Selected topics and contemporary developments in the areas of elementary and/or secondary education. The content will vary from year to year and will be announced prior to registration.

EDEC 301 SPECIAL TOPICS 2. (3) (Offered through Continuing Education) Selected topics and contemporary developments in the areas of elementary and/or secondary education. The content will vary from year to year and will be announced prior to registration.

EDEC 302 LANGUAGE AND LEARNING - CURRICULUM. (3) (Not for credit if EDSL 301 or EDSL 311 has been or is being taken) This course on language and learning across the curriculum will explore the central role of pupils' language, both oral and written, in their learning and the implications for using this learning tool in teaching. It will also consider "languages" (e.g. computers, media, etc.) in teaching and learning.

EDEC 305 COMMUNICATION IN MANAGEMENT 2. (3) (Restricted to B.Com. students. Prerequisite: EDEC 205 or based on the results of Placement Test.) (Because this course uses a workshop format, attendance at first class is desirable.) Advanced course (in English) in professional written and oral communication in Management. Assignments include résumés, business proposals, public relations documents and oral presentations. Students use a wide variety of communication technologies such as presentation software, video equipment, e-mail and the Internet.

EDEC 306 THIRD YEAR PROFESSIONAL SEMINAR. (3) (Prerequisites: EDPE 250 or EDSL 251 and EDFE 251. Corequisite: EDFE 302) (Open to B.Ed. Secondary students only) The primary focus of this seminar is on classroom management. Other topics will include cooperative and collaborative learning and the use of computers, video and visual aids in the classroom.

EDEC 307 THIRD YEAR PROFESSIONAL SEMINAR (K/ELEM). (3) (Prerequisites: EDFE 252 and EDPE 251. Corequisite: EDFE 303) (Open to B.Ed. K/Elem. students only) The seminar focuses on planning classroom teaching and puts into practice the students' knowledge of subject methodologies. Specific topics will include: the use of visual aids, music and video; the use of computers; classroom management; commonalities among subjects/grade levels; cooperative and collaborative learning strategies.

EDEC 310 KINDERGARTEN/ELEMENTARY CURRICULUM. (3) This course provides a general orientation to pedagogy and the pre-school/elementary school program. The main ideas in the elementary school subject areas (language arts, second language, mathematics, social studies, science, expressive arts, moral and religious education, and physical education) are explored individually and as an integrated whole.

● **EDEC 311 RESOURCE MANAGEMENT.** (3) (Restriction: Normally for students registered within the Certificate in First Nations and Inuit Educational Leadership)

● **EDEC 312 PRACTICUM IN EDUCATIONAL LEADERSHIP.** (3) (Restriction: Normally for students registered within the Certificate in First Nations and Inuit Educational Leadership)

* **EDEC 334 TEACHING SECONDARY SOCIAL STUDIES.** (3) An examination of Quebec and other secondary school social studies curricula: Objectives; theoretical orientation; course structures; curriculum resources. Teaching and learning methodologies both common to the social studies and specific to the disciplines of history, geography, and economics.

* **EDEC 335 TEACHING SECONDARY SCIENCE.** (3) A survey of the philosophy and curriculum principles behind modern high school

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

courses in the physical and life sciences, especially related to the Quebec context. An examination of teaching methods for junior and senior high school science.

● **EDEC 338 SECONDARY SCHOOL - MATHEMATICS 2.** (3) (Prerequisite: EDES 353.)

□ **EDEC 402 MEDIA, TECHNOLOGY AND EDUCATION.** (3) Orientation to the equipment and systems of educational technology. Examination of theories of educational technology, media education and technology education and the exploration and development of possible applications in school settings.

▲ **EDEC 403 THE DIALECTS OF INUKTITUT.** (3) (Prerequisite: EDEE 344) Study of the main Eskimo-Aleut dialects from Siberia to Greenland, looking at the effect of Inuit migrations across the Arctic on the development of dialectical differences. The main phonological, grammatical and lexical differences between the dialects and the patterns underlying these differences will be examined.

EDEC 404 FOURTH YEAR PROFESSIONAL SEMINAR. (3) (Prerequisites: EDEC 306, EDFE 302. Corequisite: EDFE 402) (Open to B.Ed. Secondary students only) This seminar will focus on: a) the relationships beyond the classroom, particularly at home, community and professional organizations; b) advanced methodology in the two teaching subjects.

EDEC 405 FOURTH YEAR PROFESSIONAL SEMINAR (K/ELEM). (3) (Prerequisites: EDFE 303 and EDEC 307. Corequisite: EDFE 403) (Open to B.Ed. K/Elem. students only) This seminar accompanies the second major block of student teaching. Measurement and evaluation will be central to the concerns and issues addressed in this seminar, as well as mainstreaming, special needs students, and responsibility for the learning of all students.

□ **EDEC 410 MULTI-CULTURED/MULTI-RACIAL CLASS.** (3) (Not for credit if EDER 464 or EDEE 441 has been or is being taken) This course addresses cultural diversity in Canadian classrooms. Students will consider the social, personal, pedagogical and political dimensions of classroom practice in a multi-lingual, multi-cultural, multi-racial society. It will be specifically related to the cultural diversity in schools in the Montreal area, as well as schools in Aboriginal communities.

□ **EDEC 500 TUTORING WRITING.** (3) Theory and practice of teaching writing through one-on-one conferencing. Focus on composition theory and research, rules of English usage, and tutorial teaching strategies. Practical experience offered through work in Writing Tutorial Service. Relevant for anyone who teaches or will teach in English at any level in any subject.

EDEE – Elementary Education

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Cods: 433

All EDEE courses, with the exception of EDEE 441 and EDEE 444, are normally given off-campus and limited to students enrolled in off-campus programs delivered through the Office of First Nations and Inuit Education.

The term "Inuktitut" in all course descriptions includes "Inuktitut" and "Inuinnaqtun"

EDEE 223 LANGUAGE ARTS PART 1. (3) This course will explore the current research and theory of language learning and the practices which provide meaningful language experiences in the context of the pre-school and elementary classroom.

● □ † **EDEE 224 LANGUAGE ARTS PART 2.** (3) (Prerequisite EDEE 223)

▲ **EDEE 230 ELEMENTARY SCHOOL MATHEMATICS.** (3) A course specially designed for elementary school teachers to provide the basic foundations, insight and understanding of the Quebec modern elementary mathematics programs.

EDEE 234 ELEMENTARY SCHOOL GEOMETRY. (3) A course specially designed for elementary school teachers to provide the basic foundations, insight and understanding of the geometry found in the Quebec modern elementary mathematics programs.

EDEE 240 USE AND ADAPTATION OF CURRICULA. (3) Provincial or Nunavut curricula as a basis for planning, materials production and evaluation. Methods of adapting curricula to local needs and of developing local courses of study in First Nations and Inuit community schools.

EDEE 241 TEACHING LANGUAGE ARTS. (3) (Prerequisite: Fluency in Inuktitut or another Aboriginal language) Organization and planning of Language Arts programs in Inuktitut or another Aboriginal language. Preparation and presentation of lesson sequences. Use of various techniques to improve language skills in listening, speaking, reading and writing.

EDEE 242 TEACHING MATHEMATICS. (3) An introduction to mathematical concepts and approaches to teaching First Nations or Inuit students at the elementary level. Emphasis on the preparation and use of materials directly related to First Nations or Inuit life.

EDEE 243 READING METHODS IN INUKTITUT/CREE. (3) (Prerequisite: Fluency in Inuktitut/Cree syllabics) Overview of reading theories and their application to Inuktitut/Cree; processes used by proficient readers. Methods of teaching reading.

EDEE 245 ORIENTATION TO EDUCATION. (3) The First Nations or Inuit classroom as a unique pedagogical setting. Introduction to planning and maintaining a learning environment for First Nations or Inuit children. Study and application of differential learning styles.

▲ **EDEE 246 CULTIVATING LANGUAGE AND THOUGHT.** (3) Study and observation of spoken language development and its maturation in First Nations or Inuit children. Application of observed data to the selection and devising of appropriate materials and methods for pre-school and elementary levels.

● **EDEE 247 INDIVIDUALIZED INSTRUCTION.** (6)

EDEE 248 READING AND WRITING INUKTITUT/CREE. (3) (Prerequisite: Fluency in Inuktitut/Cree syllabics) Methods of teaching syllabic reading and writing. Understanding the principles of sight word reading instruction, child observation, material development and guided instruction.

▲ **EDEE 249 INUKTITUT ORTHOGRAPHY AND GRAMMAR.** (3) (Prerequisite: Fluency in Inuktitut) Structure and morphology of Inuktitut for teachers working in that language. Use of orthography, both qaliujaaqpait (Roman script) and qaniujaaqpait (syllabics) as established by the Inuit Cultural Association.

EDEE 250 THE KINDERGARTEN CLASSROOM. (2) (Restriction: Not open to students who have taken EDEC 310) An orientation to the Kindergarten curriculum. Integration of the school subject areas (language arts, second language, mathematics, social sciences, science, expressive arts, moral and religious education, and physical education) in a manner appropriate to the developmental level of the pre-school child.

▲ **EDEE 270 ELEMENTARY SCHOOL SCIENCE.** (3) Science as a means of exploring and explaining our environment. A study of some of the fundamental concepts and process skills common to most elementary programs.

EDEE 275 SCIENCE TEACHING. (2) (Restriction: Not open to students who have taken EDEE 372 (Teaching Science)) A study of science programs and teaching strategies appropriate for providing elementary school children with an appreciation of the nature and method of science inquiry.

EDEE 282 TEACHING SOCIAL SCIENCES. (2) (Restriction: Not open to students who have taken EDEE 382) Programs, materials and strategies for social studies from Kindergarten through grade six.

● **EDEE 290 COOPERATIVE LEARNING.** (3)

● **EDEE 291 CULTURAL VALUES AND SOCIALIZATION.** (3)

EDEE 292 USING INSTRUCTIONAL RESOURCES. (3) Students will learn to find, assess, and use a variety of instructional resources. Specifically, they will learn how to evaluate the instructional value of software packages and other established audio-visual materials; how to make and use simple audio-visual materials; and how to find additional resource material in the library.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

▲ **EDEE 294 ALGONQUIN LANGUAGE 1.** (3) Students will learn the Algonquin phonological system. They will focus on animate/inanimate and inflections for agreement, aspect, tense and number. They will analyze word generation conventions and derive Algonquin labels to describe how Algonquin operates.

● ▲ **EDEE 295 ALGONQUIN LANGUAGE 2.** (3) (Prerequisite: EDEE 294)

● ▲ **EDEE 296 MOHAWK SECOND LANGUAGE 1.** (3)

▲ **EDEE 297 MOHAWK LANGUAGE 1.** (3) Students will learn the Mohawk phonological system (including glottal stop, length mark, up and down stress). Syntactically and morphologically, they will focus on the pronoun system (tense included). Word generation conventions will be analyzed and Mohawk labels developed to describe how the language functions.

▲ **EDEE 298 MOHAWK LANGUAGE 2.** (3) (Prerequisite: EDEE 297) Students will complete their earlier study of the predictable items in the language, and then will focus on the non-predictable items in Mohawk: irregular verbs, reflexive and semi-reflexive verbs, purposive stem, translocative, etc. Importance will be placed on developing reading and writing skills.

▲ **EDEE 325 CHILDREN'S LITERATURE.** (3) (Offered through Continuing Education) (Not open to students who have taken ENGL 240, ENGL 341) (Limited enrollment) Selection and use of literature suitable for children in the elementary school.

EDEE 332 TEACHING MATHEMATICS 1. (3) Curriculum trends in teaching mathematics to children. Programs, methods, materials and evaluation procedures appropriate for the elementary school. Please check timetable information for labs schedule.

▲ **EDEE 340 SPECIAL TOPICS: CULTURAL ISSUES.** (3) Seminars on Inuit culture or on selected aspects of the culture of First Nations peoples. Topics will include historical cultural contacts, native oral tradition, religious beliefs and cultural change. Preparation of a project on an aspect of First Nations or Inuit life will be required.

● ▲ **EDEE 341 INUKTITUT FOR BEGINNERS.** (3)

▲ **EDEE 342 INTERMEDIATE INUKTITUT/AMERINDIAN LANGUAGE.** (3) (Prerequisite(s): EDEE 249 or equivalent, e.g. EDEE 295, EDEE 298 or permission of Director) A study for Inuktitut/Amerindian language speakers, of Inuktitut/Amerindian language phonology and structure, emphasizing the connection between the two, demonstrating the orderliness of many dialectic differences.

● ▲ **EDEE 346 LITERATURE AND CREATIVE WRITING 2.** (3) (Prerequisite: EDEE 345)

▲ **EDEE 344 ADVANCED INUKTITUT/AMERINDIAN LANGUAGE.** (3) (Prerequisite(s): EDEE 342 or permission of Director) The final course in a set dealing with Inuktitut/Amerindian Language phonology and structure. An understanding of basic Inuktitut/Amerindian Language syntax in particular, rules governing verb and possessive endings.

▲ **EDEE 345 LITERATURE AND CREATIVE WRITING 1.** (3) A study of the development of oral and written poetry and prose in the various dialects of Inuktitut or of another Aboriginal Language from pre-European contact to the present day. Emphasis on themes and structures in contemporary writings. Original production of poetry, narrative, drama and journalism in the selected language is required of each student.

● **EDEE 350 INTEGRATING THE CURRICULUM.** (2) (Restricted to B.Ed. (K/Elem) students)

● **EDEE 352 CLASSROOM PRACTICES.** (2) (Restricted to students in B.Ed. (K/Elem))

● **EDEE 355 CLASSROOM-BASED EVALUATION.** (3) (Restriction to B.Ed. (K/Elem) students)

EDEE 372 TEACHING SCIENCE. (3) (Students must check timetable information for labs schedule) A study of science programs and teaching strategies appropriate for providing elementary school children with an appreciation of the nature and method of science inquiry.

EDEE 382 TEACHING SOCIAL STUDIES. (3) Programs, materials and strategies for social studies from Kindergarten through grade six.

● † **EDEE 402 CURRICULUM DEVELOPMENT.** (3)

● **EDEE 402D1 CURRICULUM DEVELOPMENT.** (1.5)

● **EDEE 402D2 CURRICULUM DEVELOPMENT.** (1.5)

EDEE 435 MATHEMATICS TOPICS. (3) (Permission of instructor) (Offered through Continuing Education) Seminars and workshops on specific topics in mathematics education. One to three topics will be chosen, from such areas as construction of teaching materials, evaluation, audio-visual techniques, use of calculating instruments, readiness for mathematics concepts, and curriculum development. This course will make significant use of microcomputers in mathematics education.

EDEE 441 FIRST NATIONS AND INUIT EDUCATION. (3) (Not for credit if EDEC 410 or EDER 464 has been or is being taken) Study of First Nations and Inuit schools as diverse social, cultural, linguistic, political and pedagogical settings. Considers school and community minority-majority interactions and their influence on teaching and learning in educational settings. Examines how a teacher's personal practice can be influenced by an understanding of these factors.

● **EDEE 444 FIRST NATIONS AND INUIT CURRICULUM.** (3)

● **EDEE 467 SPECIAL TOPICS IN READING.** (3)

▲ **EDEE 473 ECOLOGICAL STUDIES.** (3) (Offered through Summer Studies) A lecture, laboratory and field course to train elementary school teachers in the principles and practices of field biology and nature tours. The observation and identification of various organisms and a study of their ecological relationships in the web of life.

● ▲ **EDEE 474 PROBLEMS OF THE ENVIRONMENT.** (3) (Offered through Summer Studies)

EDEM – Administration and Policy Studies in Education

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Code: 411

EDEM 202 EDUCATIONAL AND ADMINISTRATIVE INSTITUTIONS. (3) (Limited to students enrolled in off-campus programs delivered through the Office of First Nations and Inuit Education) A study of the inter-dependency of the various institutions affecting the education of Inuit or First Nations children. Relationships of non-education institutions, such as Co-ops, Health and Social Services, and other government services, to educational services.

EDEM 405 POLICY ISSUES IN QUEBEC EDUCATION. (3) This course examines the organization of education in Quebec from various perspectives, including historical, political, social and legal. It aims to provide students with sufficient knowledge that they can begin the life-long learning process of a professional educator, aware of, and contributing to, the policy talk on school.

● **EDEM 405D1 POLICY ISSUES IN QUEBEC EDUCATION.** (1.5)

● **EDEM 405D2 POLICY ISSUES IN QUEBEC EDUCATION.** (1.5)

● **EDEM 450 CURRICULUM ALTERNATIVES.** (3) (Offered through Summer Studies)

EDER – Religious Studies

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Codes: 415 Catholic Studies,
421 Protestant Studies, 422 Jewish Studies,
423 Philosophy of Education

● ☐ ▲ **EDER 203 PHILOSOPHY OF RELIGION.** (3)

● ☐ ▲ **EDER 204 MAN BEFORE REALITY.** (3)

● ▲ **EDER 207 'WHO IS CHRIST?'** (3) (Offered through Continuing Education)

● ☐ ▲ **EDER 208 PHILOSOPHY OF HUMAN NATURE.** (3)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

☐ ▲ **EDER 209 SEARCH FOR AUTHENTICITY.** (3) (Offered through Continuing Education) A search for meaning in contemporary living as reflected in selected authors.

● ☐ **EDER 252 UNDERSTANDING AND TEACHING JEWISH LIFE.** (3)

● ☐ ▲ **EDER 290 GUIDE TO READING THE BIBLE.** (3)

☐ ▲ **EDER 309 THE RELIGIOUS QUEST.** (3) (Offered through Continuing Education) An approach to the study of religious experience as expressed in humanity's major religious traditions, especially Christianity, Judaism, Islam, Hinduism and Buddhism.

● ☐ **EDER 320 VISIONS AND REALITIES OF JEWISH EDUCATION.** (3)

● ☐ ▲ **EDER 324 VALUES AND HUMAN SEXUALITY.** (3) (Offered through Distance Education)

☐ **EDER 332 GUIDING RELIGIOUS RESPONSE - ELEMENTARY.** (3) Religious and moral phases in the development of the elementary school child and an exploration of various programs and procedures for cultivating this development.

EDER 333 MORAL/RELIGIOUS EDUCATION ELEMENTARY CURRICULUM. (3) The elementary curriculum in moral and religious education: content structure, guidelines and contextual policies; methods and materials related to moral and religious education in classroom settings.

* **EDER 340 MORAL EDUCATION CURRICULUM AND INSTRUCTION.** (3) Critical assessment of theories and models of moral education, including cognitive and affective approaches; moral education curricula and teaching methods; aims, strategies and evaluation techniques.

● **EDER 360 MRE IN THE K/ELEM. CURRICULUM.** (2) (Restriction: Not open to students who have taken EDER 333)

● **EDER 370 CLASSROOM STRATEGIES: JEWISH STUDIES.** (3)

* **EDER 372 HUMAN AND RELIGIOUS VALUES IN SECONDARY SCHOOL.** (3) An enquiry into teaching methods in two areas: (1) Religion (as a phenomenon of human experience). (2) The development of moral judgment in social and personal issues.

● **EDER 375 CATHOLIC RELIGIOUS EDUCATION (K/ELEM).** (2) (Restriction: Not open to students who have taken EDER 332)

* **EDER 392 GUIDING RELIGIOUS RESPONSE - SECONDARY.** (3) A study of developmental religious and moral life of the secondary school student, and of the programs and procedures designed to meet this development.

☐ ▲ **EDER 394 PHILOSOPHY OF GOD.** (3) (Offered through Continuing Education) A critical study of the concept of God from a variety of religious, philosophic and mystical perspectives.

☐ ▲ **EDER 395 MORAL VALUES AND HUMAN ACTION.** (3) A philosophical critical inquiry into the relationship between belief and conduct oriented toward the teacher and his/her role in education.

☐ ▲ **EDER 396 SEMINAR: CONTEMPORARY THEOLOGY.** (3) (Offered through Continuing Education) A reading seminar course in which current theological problems are discussed. Specific topics may differ from year to year.

☐ * **EDER 398 PHILOSOPHY OF CATHOLIC EDUCATION.** (3) An exploration of the philosophy of Catholic education, and its relevance in the world today.

☐ * **EDER 400 PHILOSOPHICAL FOUNDATIONS OF EDUCATION.** (3) Ideas essential for the development of a coherent educational theory and sound professional practice. Reflections on: the nature of the person, of reality, of knowledge, and of value; the aims of education, the nature of the school and the curriculum, the roles and responsibilities of professional educators.

☐ **EDER 401 TEACHING BIBLICAL LITERATURE - JEWISH SCHOOL 1.** (3) Examination of Biblical passages raising theological, moral, historical, literary, or linguistic challenges, and their interpretation within the rabbinic tradition and modern scholarship. Methodologies for teaching such passages in Jewish studies classrooms are discussed. Some familiarity with Biblical and Rabbinic Hebrew is essential, but most texts are available in English.

● **EDER 404 TEACHING HEBREW AS A SECOND LANGUAGE.** (3) (Prerequisite: JWST 340 or its equivalent)

● ☐ ▲ **EDER 406 COMPARATIVE EDUCATION.** (3)

☐ **EDER 407 TEACHING THE JEWISH LITURGY.** (3) (Prerequisite: JWST 333 or permission of instructor) Survey of the high holiday and festival liturgy of the Jewish people, including the Passover Haggadah. Emphasis is placed on the meaning and purpose of prayer, and on the theological, moral and philosophical issues raised by the texts. Curriculum developed for teaching prayer and fostering spirituality within Jewish educational frameworks is examined and evaluated.

● ☐ ▲ **EDER 408 HUMAN VALUES AND EDUCATION.** (3) (Offered through Distance Education)

● ☐ **EDER 409 WOMEN AND EDUCATION.** (3) (Core course for the Women's Studies Minor Program)

● **EDER 411 TEACHING YIDDISH AS SECOND LANGUAGE.** (3)

● ☐ **EDER 420 TEACHING JEWISH HISTORY.** (3)

● ☐ **EDER 421 TEACHING THE HOLOCAUST.** (3)

EDER 451 TUTORIAL IN JEWISH EDUCATION. (3) A reading course for students who wish to explore intensively the literature in a particular area related to teaching Jewish studies.

☐ ▲ **EDER 461 SOCIETY AND CHANGE.** (3) Factors influencing patterns of stability and change in major social institutions and the implications for formal and non-formal education.

● **EDER 462 LEARNING IN CONTEMPORARY SOCIETY.** (3)

☐ * **EDER 464 INTERCULTURAL EDUCATION.** (3) (Not for credit if EDEC 410 or EDEE 441 has been or is being taken) Issues of learning and teaching in multicultural classrooms; development of understanding of different cultures and cultural perspectives.

☐ ▲ **EDER 473 LIVING WITH INSIGHT.** (3) An examination of the moral and spiritual challenges of the modern and post-modern world. Emphasis will also be placed on the role and responsibility of education in meeting these challenges.

● ☐ ▲ **EDER 491 THEOLOGICAL THEMES.** (3) (Offered through Continuing Education)

☐ ▲ **EDER 494 ETHICS IN PRACTICE.** (3) Fundamental principles of ethics as applied to current moral issues such as abortion, drugs, nuclear war, and discrimination.

● ☐ ▲ **EDER 505 EDUCATION AND SOCIAL ISSUES.** (3)

EDES – Secondary Education

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Code: 425

● **EDES 303 PLANNING FOR TEACHING.** (3)

EDES 350 CLASSROOM PRACTICES (SECONDARY). (3) Competency-based discipline skills and methods of classroom management, emphasizing the relationship between theory and practice; the rationale for various approaches to classroom management; strategies for developing instruction that focus attention and reduce off-task behaviour.

* † **EDES 353 SECONDARY SCHOOL MATHEMATICS 1.** (3) (Prerequisites: 18 credits in post-secondary mathematics) Directed observations in secondary schools and the study of the general objectives and curriculum trends. The learning problems, teaching strategies and mathematical concepts encountered in the High School curriculum.

● **EDES 353D1 SECONDARY SCHOOL MATHEMATICS 1.** (1.5)

● **EDES 353D2 SECONDARY SCHOOL MATHEMATICS 1.** (1.5)

* † **EDES 361 SECONDARY SCHOOL ENGLISH 1.** (3) Examination of appropriate materials related to the high school English programs; exploration of various techniques of teaching language, literature, writing and dramatics in the secondary school.

EDES 365 EXPERIENCES IN COMMUNICATIONS. (3) (Offered through Continuing Education) Personal development of students as com-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

municators; involvement of the imagination in individual and group projects in language and in an other chosen medium of communication: analysis of experiences in projects in relation to general problems of communication. Continuing Education - Topic for 2003-04: Technical Writing. This course will provide the fundamental concepts and principles of technical writing including technical description, editing, document specifications and outlines, graphics, definitions, audience analysis, and document revision. Instruction on how to format and design pages, conduct and document research, use electronic mail and Web sites, make effective oral presentations, and think critically and ethically about writing.

▲ **EDES 366 LITERATURE FOR YOUNG ADULTS.** (3) (Offered through Continuing Education)

* † **EDES 370 TEACHING GENERAL SCIENCE.** (3) (Prerequisite: EDEC 335) Principles and procedures for implementation of the general science curriculum in the secondary schools of Québec. A survey of teaching methods and laboratory management appropriate to the junior and senior high school level.

* **EDES 389 ISSUES IN SOCIAL STUDIES.** (3) (Corequisite: EDEC 334) This course will examine the nature, content, and methodology of social studies education in the secondary school.

● **EDES 461 SECONDARY SCHOOL ENGLISH 2.** (3) (Restriction: Open to B.Ed Secondary students having English as a teaching option.) (Prerequisite : EDES 361)

EDET – Vocational Education

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Code: 436

EDET 275 FIELD EXPERIENCE: OVERVIEW.(3) (Offered through Continuing Education) Participation and/or observation on location in an industry or business. A study of the total operations of a selected industrial or commercial enterprise. A comprehensive technical report is submitted upon completion of the work study.

EDET 278 FIELD EXPERIENCE: OVERVIEW.(6) (Offered through Continuing Education) Participation and/or observation on location in an industry or business. A study of the total operations of a selected industrial or commercial enterprise. Includes an investigation of the inter-relationship of specific parts of sub-divisions to the product produced or the service rendered.

● **EDET 358 SPECIAL PROJECT.** (3) (Offered through Continuing Education)

EDET 360 TEACHING BUSINESS SUBJECTS. (3) (Offered through Continuing Education) A course in general teaching principles which will include the teaching and learning process, lesson planning, unit planning, and techniques of instruction specific to: a) Accounting and Business Machines b) Typewriting and Shorthand.

EDET 373 TEACHING TECHNICAL SUBJECTS. (3) (Offered through Continuing Education) Methods and techniques of instruction in vocational education subjects. Classroom management and administration. Lesson planning and use of instructional materials. Individual assignments, demonstrations and reports. Special problems of the teacher.

EDET 378 FIELD EXPERIENCE: PROCESS. (3) (Offered through Continuing Education) A work study experience selected in consultation with an advisor focusing on new equipment, techniques or practices recently introduced into industry or business. Requirements include the preparation and submission of a technical report.

EDET 379 FIELD EXPERIENCE: PROCESS. (6) (Offered through Continuing Education) A work study experience selected in consultation with an advisor focusing on new equipment, techniques or practices recently introduced into industry or business. Requirements include the preparation and submission of a technical report.

* **EDET 395 PRINCIPLES AND FOUNDATIONS.** (3) (Offered through Distance Education) A study of leaders, movements, legislation, events, and institutions that have contributed to the formation and

development of vocational education. Special attention given to economic, social and philosophical factors.

EDET 398 SPECIAL PROJECT. (3) (Offered through Continuing Education) (May also be offered through Distance Education.) A project related to the student's teaching concentration will be investigated, developed, produced, implemented, and/or evaluated, depending on the nature of the project. Students must identify the problem or topic to be investigated and obtain approval of the instructor. Includes preparation and submission of a written report.

● **EDET 461 TEACHING ACCOUNTING.** (3) (Offered through Distance Education) (Prerequisites: MGCR 211 or equivalent)

● **EDET 476 SPECIAL SEMINARS.** (3)

EDET 477 FIELD EXPERIENCE: METHODOLOGY. (3) (Offered through Continuing Education) A workstudy experience involving observation and evaluation of training techniques and pedagogical principles used by business or industry in the preparation of personnel for specified tasks. Includes preparation and submission of a technical report.

EDET 478 FIELD EXPERIENCE: METHODOLOGY. (6) (Offered through Continuing Education) A workstudy experience involving observation and evaluation of training techniques and pedagogical principles used by business or industry in the preparation of personnel for specified tasks. Includes preparation and submission of a technical report.

● **EDET 482 SELECTED STUDIES.** (3) (Offered through Continuing Education) (Prerequisite: normally taken at the U3 level)

EDFC – Bachelor of Education Core Program

Offered by: Education - Dean's Office
Former Teaching Unit Code: 448

● * **EDFC 301 ORIENTATION: SECONDARY SCHOOL TEACHING.** (0) (Co-requisite to all practice teaching courses in the secondary school level; required for secondary IG Diploma and B.Ed. U3 programs.)

● **EDFC 497 INDIVIDUAL RESEARCH PROJECT.** (3)

● **EDFC 498 INDIVIDUAL RESEARCH PROJECT.** (6) (Prerequisites: open only to U3 level students and students who have completed most of the requirements of a certificate or diploma program, and with permission of the program advisor or director)

EDFE – Student Teaching

Offered by: Education - Dean's Office
Former Teaching Unit Code: 435

EDFE 200 FIRST YEAR FIELD EXPERIENCE. (2) (Corequisite: EDEC 201) (Open to B.Ed. Secondary and B.Ed. K/Elem. students) This field experience involves observation in second language classrooms for the equivalent of about ten days. Observations will include the use of observation schemes designed to capture information about second language classrooms and programs.

EDFE 205 1ST FIELD EXPERIENCE MUSIC. (2) (Corequisite: EDEA 206) Ten days of observation and some limited teaching in an elementary school under the supervision of a cooperating music teacher.

● **EDFE 206 SECOND YEAR FIELD EXPERIENCE (MUSIC).** (2) (Prerequisites: EDEA 206 and EDFE 205. Corequisite: EDEA 207) (Open to B.Ed. in Music students)

● **EDFE 207 2ND FIELD EXPERIENCE MUSIC.** (4) (Prerequisite: EDFE 205.) (Restriction: Students in B.Ed. in Music and Concurrent B.Ed./B.Mus.)

EDFE 209 FIRST YEAR FIELD EXPERIENCE. (2) (Prerequisite: EDSDL 300. Corequisite: EDSDL 209) This field experience involves observation in second language classrooms for the equivalent of about ten days. Observations will include the use of observation schemes

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

designed to capture information about second language classrooms and programs.

● **EDFE 246 FIRST YEAR FIELD EXPERIENCE (ELEM.).** (3) (Prerequisite: EDKP 342)

EDFE 251 SECOND YEAR FIELD EXPERIENCE. (2) (Prerequisites: EDEC 201 and EDFE 200. Corequisites: EDPE 250 or EDSL 251) (Open to B.Ed. Secondary students only) The student teacher will be assigned to a school and will work with individuals or small groups of students under a mentor-teacher.

EDFE 252 SECOND YEAR FIELD EXPERIENCE (K/ELEM). (2) (Prerequisites: EDFE 200 and EDEC 201. Corequisite: EDPE 251) (Open to B.Ed. K/Elem. students only) Students will teach a specified number of days in an early childhood environment. This will provide students with the competence to work effectively in such settings and will complement the two later field experiences (III and IV) conducted at cycles one and two of the elementary level.

● **EDFE 253 SECOND FIELD EXPERIENCE (K/ELEM).** (4) (Restriction: Restricted to B.Ed. (K/Elem) students) (Prerequisite: EDFE 200 and EDEC201)

● **EDFE 254 SECOND FIELD EXPERIENCE (SEC).** (3) (Prerequisite: EDEC 201 and EDFE 200)

EDFE 259 SECOND YEAR FIELD EXPERIENCE. (2) (Prerequisite: EDSL 209 and EDFE 209. Corequisite: EDSL 259) During the second-year field experience, the student will assist experienced school personnel in a variety of classroom learning situations for the equivalent of about ten days.

EDFE 260 STAGE DE FAMILIARISATION. (1) (Not open to students who have taken UdeM: EDU 1060.) Stage de familiarisation à l'école en milieu pluriethnique et d'introduction à la fonction enseignante. Observation des élèves à l'école. Contacts avec des intervenants. Étude du projet éducatif.

● **EDFE 261 STAGE D'ASSISTANAT - 2E ANNÉE.** (3) (Prerequisites: EDFE 260.) (Corequisites: EDSL 260)

EDFE 303 THIRD FIELD EXPERIENCE (K/ELEM). (7) (Prerequisites: EDFE 253, EDEE 223, EDEE 332) (Open to B.Ed. K/Elem. students only) This first major field experience will consist of about 35-40 days of student teaching under the tutelage of school personnel.

EDFE 305 THIRD YEAR FIELD EXPERIENCE (MUSIC). (7) (Prerequisites: EDFE 206. Corequisite: EDEA 306) Thirty-five days of teaching in an elementary school under the supervision of a music teacher and other school personnel. Students will gradually assume more responsibility for student learning, formative and summative evaluation, and will be expected to experience a full teaching load.

EDFE 394 FIELD EXPERIENCE ELEMENTARY AND SECONDARY. (3)

EDFE 346 FIELD EXPERIENCE - ELEMENTARY SCHOOL. (9)

● **EDFE 346D1 FIELD EXPERIENCE - ELEMENTARY SCHOOL.** (4.5)

● **EDFE 346D2 FIELD EXPERIENCE - ELEMENTARY SCHOOL.** (4.5)

EDFE 348 THIRD YEAR FIELD EXPERIENCE PHYSICAL EDUCATION. (6) (Prerequisite: EDKP 442) This first major field experience consists of six weeks of supervised student teaching in physical education under the tutelage of school personnel.

EDFE 351 THIRD YEAR FIELD EXPERIENCE (SEC.). (8) (Prerequisites: EDFE 251, EDPE 250 or EDSL 251. Corequisite: EDEC 306) (Open to B.Ed. Secondary students only. Students must have completed, with a grade of C or higher, a minimum of 18 credits in each of their two teaching subjects) This first field experience will consist of about 40 days of student teaching under the tutelage of school personnel.

EDFE 359 THIRD YEAR FIELD EXPERIENCE (ESL/FSL). (8) (Prerequisites: EDSL 259 and EDFE 259. Corequisites: EDSL 309 and EDSL 447) The third-year field experience will consist of about 40 days of student teaching under the tutelage of experienced school personnel at the elementary level.

● **EDFE 361 STAGE D'ENSEIGNEMENT 1.** (7) (Prerequisites: EDSL 260, EDFE 261. Corequisites: EDSL 391, EDSL 394.) (Not open to students who have taken UdeM: EDU 3060.)

● **EDFE 362 STAGE D'ENSEIGNEMENT EN FRANÇAIS LANGUE SECONDE.** (7)

● **EDFE 373 SECOND YEAR FIELD EXPERIENCE PHYSICAL EDUCATION (SEC).** (3) (Prerequisite: EDFE 246)

EDFE 374 FIELD EXPERIENCE SECONDARY SCHOOL ONE SUBJECT. (3) (1 subject)

EDFE 374D1 FIELD EXPERIENCE SECONDARY SCHOOL ONE SUBJECT. (1.5) (Students must also register for EDFE 374D2) (No credit will be given for this course unless both EDFE 374D1 and EDFE 374D2 are successfully completed in consecutive terms) (EDFE 374D1 and EDFE 374D2 together are equivalent to EDFE 374)

EDFE 374D2 FIELD EXPERIENCE SECONDARY SCHOOL ONE SUBJECT. (1.5) (Prerequisite: EDFE 374D1) (No credit will be given for this course unless both EDFE 374D1 and EDFE 374D2 are successfully completed in consecutive terms) (EDFE 374D1 and EDFE 374D2 together are equivalent to EDFE 374)

● **EDFE 377D1 FIELD EXPERIENCE SECONDARY SCHOOL (TWO SUBJECT).** (7.5)

● **EDFE 377D2 FIELD EXPERIENCE SECONDARY SCHOOL (TWO SUBJECT).** (7.5) (Prerequisite: EDFE 377D1)

● **EDFE 380 3RD YEAR FIELD EXPERIENCE PHYSICAL EDUCATION.** (7) (Prerequisite: EDFE 373 and EDKP 442) (Only open to B.Ed. Physical Education students)

EDFE 403 FOURTH YEAR FIELD EXPERIENCE (K/ELEM). (8) (Prerequisites: EDFE 303, EDEE 223, EDEE 332, EDEE 372, EDEE 382 and EDEC 307. Corequisite: EDEC 405) (Open to B.Ed. K/Elem. students only) This second major field experience consisting of about 40-45 days of student teaching, will provide the opportunity to further enhance and develop teaching skills under the tutelage of school personnel. Students will be expected to assume an increased responsibility for students' learning, classroom management and formative and summative evaluations.

EDFE 405 FOURTH YEAR FIELD EXPERIENCE (MUSIC). (8) (Prerequisites: EDEA 306 and EDFE 305. Corequisite: EDEA 406) Forty days of teaching in a secondary school under the supervision of experienced school personnel in music and a second subject area. Students will gradually assume more responsibility for student learning, formative and summative evaluation, and will be expected to experience a full teaching load.

● **EDFE 406 FOURTH FIELD EXPERIENCE (K/ELEM).** (7) (Prerequisite: EDFE 303, EDEE 223, EDEE 332, EDEE 275, EDEE 282. Corequisite: EDEC 405) (Not open to students who have taken EDFE 403)

● **EDFE 407 4TH FIELD EXPERIENCE MUSIC.** (7) (Prerequisite: EDFE 305. Corequisite: EDEA 407.) (Restriction: Students in B.Ed. in Music and the Concurrent B.Ed./B.Mus.)

● **EDFE 409 FOURTH YEAR FIELD EXPERIENCE (ESL/FSL).** (8)

EDFE 422 ABORIGINAL EDUCATION PRACTICUM 1. (3) (Restricted to students registered in the Certificate in Education for First Nations and Inuit) Students will teach a specific number of weeks in an elementary school environment.

EDFE 423 ABORIGINAL EDUCATION PRACTICUM 2. (3) (Restricted to students registered in the Certificate in Education for First Nations and Inuit) Students will teach a specific number of weeks in an elementary school environment.

EDFE 444 FIELD EXPERIENCE - ELEMENTARY SCHOOL. (3)

● **EDFE 444D1 FIELD EXPERIENCE - ELEMENTARY SCHOOL.** (1.5)

● **EDFE 444D2 FIELD EXPERIENCE - ELEMENTARY SCHOOL.** (1.5)

EDFE 451 FOURTH YEAR FIELD EXPERIENCE (SECONDARY). (7) (Prerequisites: EDFE 351, EDEC 351. Corequisite: EDEC 404 or EDSL 400 or EDSL 401) (Open to B.Ed. Secondary students only) This major field experience of about 35 days of student teaching will provide the opportunity to further enhance and develop teaching skills under the tutelage of school personnel. Students will be expected to assume more responsibility for student learning, classroom management and formative and summative evaluation.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

EDFE 459 FOURTH YEAR FIELD EXPERIENCE (ESL/FSL). (7) (Prerequisites: EDSE 309 and EDFE 359. Corequisites: EDSE 409 and EDSE 458) The fourth-year field experience will consist of about 35 days of student teaching under the tutelage of experienced school personnel at the secondary level.

● **EDFE 460 ENSEIGNEMENT EN MILIEU PLUIETHNIQUE. GESTION** (9) (Prerequisite: EDSE 402, EDFE 361. Corequisite: EDSE 498, EDSE 499.) (Not open to students who have taken UdeM: EDU 4060.)

● **EDFE 461 STAGE D'ENSEIGNEMENT - IMMERSION.** (9)

EDFE 478 FIELD EXPERIENCE (ONE SUBJECT) - SECONDARY LEVEL. (6) (1 subject)

EDFE 478D1 FIELD EXPERIENCE (ONE SUBJECT) - SECONDARY LEVEL. (3) (Students must also register for EDFE 478D2) (No credit will be given for this course unless both EDFE 478D1 and EDFE 478D2 are successfully completed in consecutive terms) (EDFE 478D1 and EDFE 478D2 together are equivalent to EDFE 478)

EDFE 478D2 FIELD EXPERIENCE (ONE SUBJECT) - SECONDARY LEVEL. (3) (Prerequisite: EDFE 478D1) (No credit will be given for this course unless both EDFE 478D1 and EDFE 478D2 are successfully completed in consecutive terms) (EDFE 478D1 and EDFE 478D2 together are equivalent to EDFE 478) See EDFE 478D1 for course description.

EDFE 479 FOURTH YEAR FIELD EXPERIENCE PHYSICAL EDUCATION. (6) (Prerequisite: EDKP 442) This second major field experience consists of six weeks of supervised student teaching in physical education under the tutelage of school personnel.

● **EDFE 480 4TH YEAR FIELD EXPERIENCE PHYSICAL EDUCATION.** (7) (Prerequisite: EDFE 380) (Only open to B.Ed. Physical Education students)

EDFE 494 FIELD EXPERIENCE - SECONDARY SCHOOL (ONE SUBJECT). (9) (1 subject)

● **EDFE 495 FIELD EXPERIENCE-ELEMENTARY & SECONDARY PHYSICAL EDUCATION.** (9)

EDKP – Physical Education

Offered by: Kinesiology and Physical Education
Former Teaching Unit Code: 434

Students taking physical education skills and techniques courses are required to wear a costume appropriate to the activity as approved by the instructor. Students are also responsible for providing some items of personal sports equipment such as skis, skates, etc.

□ **EDKP 200 WEIGHT TRAINING.** (1)

EDKP 201 FITNESS LEADERSHIP. (3) The methods of active lifestyle leadership from establishment of appropriate fitness objectives through the means of helping clients achieve their goals. Included are individual and group program designs and exercise precautions in various forms of exercise programs.

EDKP 202 RHYTHMIC ACTIVITIES. (1)

● ▲ **EDKP 204 HEALTH EDUCATION.** (3) (Open only to students in the Certificate in First Nations and Inuit Education)

▲ **EDKP 205 STRUCTURAL ANATOMY.** (3) Skeletal, muscular and nervous system are examined anatomically and physiologically within the realm of how they interact to generate and apply the forces which permit man's mobility.

▲ **EDKP 206 BIOMECHANICS OF HUMAN MOVEMENT.** (3) (Prerequisite: EDKP 205) Analysis of fundamental human movement and the kinematic concepts which underlie each: Stability, agility, walking, running, jumping, throwing, absorbing forces, striking, kicking, spinning, twisting, aquatics and work positions.

● ▲ **EDKP 207 EVALUATION OF HUMAN PERFORMANCE.** (3)

EDKP 210 EDUCATIONAL GYMNASTICS. (1)

EDKP 212 FOLK DANCE. (1)

EDKP 213 AQUATICS 1. (1)

EDKP 214 BASKETBALL 1. (1)

EDKP 216 GYMNASTICS 1. (1)

EDKP 217 TRACK AND FIELD. (1) Personal skill development in the basic skills and techniques of track and field events.

EDKP 218 VOLLEYBALL 1. (1)

EDKP 220 CREATIVE DANCE. (1)

EDKP 221 WRESTLING 1. (1)

EDKP 223 BASIC GAMES. (2) Content and methodology of games teaching in elementary and secondary school settings.

● ▲ **EDKP 224 FOUNDATIONS OF MOVEMENT EDUCATION.** (3) (Not open to P.E. Majors)

● **EDKP 225 ARCHERY/GOLF.** (1)

EDKP 226 BADMINTON. (1)

EDKP 227 RUGBY. (1)

EDKP 228 FOOTBALL 1. (1)

EDKP 229 ICE HOCKEY 1. (1)

● **EDKP 231 MARTIAL ARTS.** (1)

EDKP 233 SOCCER. (1)

EDKP 234 TEAM HANDBALL. (1)

EDKP 235 TENNIS. (1)

EDKP 236 SOFTBALL. (1)

EDKP 238 FIELD HOCKEY 1. (1)

● **EDKP 239 RHYTHMIC GYMNASTICS.** (1)

EDKP 240 WINTER ACTIVITIES. (1)

● ▲ **EDKP 241 ABORIGINAL PHYSICAL ACTIVITIES.** (3) (Open only to students in the Certificate in Education for First Nations and Inuit)

EDKP 243 DANCE. (1) (Prerequisite: EDKP 202)

□ **EDKP 244 DANCE AND FITNESS.** (1)

EDKP 245 SPECIAL TOPICS 1. (1)

● **EDKP 248 RESISTANCE TRAINING.** (1)

EDKP 249 PHYSICAL ACTIVITY APPRAISAL. (1)

† **EDKP 250 PRACTICUM 1.** (3) (Corequisite: EDKP 201) A practical work-study experience with a focus on instruction and leadership in fitness. Work will be in a community placement under a qualified sponsor selected with the approval of the Department.

Also offered as:

EDKP 250D1 PRACTICUM 1. (1.5)

EDKP 250D2 PRACTICUM 1. (1.5)

● **EDKP 252 RACQUET SPORTS.** (2) (Not open to students who have taken EDKP 226 and EDKP 235)

● **EDKP 253 GYMNASTICS.** (2) (Not open to students who have taken EDKP 216 and EDKP 210)

EDKP 254 PRINCIPLES OF DANCE. (2) (Not open to students who have taken EDKP 202 and EDKP 243) Basic dance skills, dance as a movement form, dance curriculum content and dance teaching skills, and resources to support dance instructional programs.

▲ **EDKP 261 MOTOR DEVELOPMENT.** (3) Changes apparent in motor behaviour from conception to old age. Two perspectives are emphasized: 1) contemporary and historical theories of human development, 2) development of motor behaviour and influences of physical growth, sensori-perceptual development, information processing and socio-cultural factors.

EDKP 292 NUTRITION AND WELLNESS. (3) This course will examine the role of carbohydrates, fats, proteins, vitamins, minerals and water in a balanced diet. Students will be introduced to the affects of nutrition on exercise, sport performance and wellness. The validity of claims concerning nutrient supplements will be studied.

EDKP 293 ANATOMY AND PHYSIOLOGY. (3) Basic foundations of structural, neuromuscular and visceral anatomy extending to the basic elements of the neuromuscular, circulatory and respiratory

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

systems with emphasis on applications in instructional and coaching settings.

EDKP 300 SPECIAL TOPICS. (3) Content will vary from year to year and will be announced prior to registration. The course will be given by a single instructor or by a group, as the occasion warrants.

EDKP 307 EVALUATION IN PHYSICAL EDUCATION. (3) (Prerequisite: EDFE 246) (Not open to students who have taken EDKP 207) Measurement and evaluation techniques designed to assess progress in physical education settings.

EDKP 311 ATHLETIC INJURIES. (3) (Prerequisite: EDKP 205) (Offered through Continuing Education) This course is designed to educate students about the prevention, immediate care, and minor rehabilitation of athletic injuries. The course will focus on specific situations encountered in elementary, high school and fitness centers. An intensive academic program is coupled with practical lab sessions and field experience.

EDKP 314 BASKETBALL 2. (1)

● ▲ **EDKP 324 MOVEMENT EDUCATION ACTIVITIES.** (3) (Not open to P.E. Majors)

EDKP 330 PHYSICAL ACTIVITY AND HEALTH. (3) This course introduces students to literature on the role of physical activity and general health and well-being. Students will examine issues of exercise adherence, exercise prescription and the economic impact of physical fitness programs in the workplace.

▲ **EDKP 331 HOMEOSTATIC PHYSIOLOGY.** (3) (Prerequisite: EDKP 205) Introduction to the basic principles of physiological mechanisms which maintain homeostasis of the mammalian organism during non-stress conditions: cell function, neural systems and conduction; kidney, blood, cardiovascular system; respiration and metabolism.

EDKP 332 PHYSICAL EDUCATION CURRICULUM AND INSTRUCTION. (3) (Not open to P.E. Majors) Principles, programs and procedures that an elementary teacher may use to promote the designing and teaching of elementary school P.E.

● **EDKP 336 LACROSSE.** (1)

† **EDKP 342 PHYSICAL EDUCATION METHODS.** (3) This course is a prerequisite for all field experience and practice.) Designed to prepare students for a teaching/leadership role in physical education. They will examine teaching/leadership effectiveness as it relates to organization and observation techniques, planning, instruction and evaluation of physical activity.

● † **EDKP 350 PRACTICUM 2.** (3) (Prerequisite: EDKP 250)

Also offered as:

EDKP 350D1 PRACTICUM 2. (1.5) (Students must also register for EDKP 350D2) (No credit will be given for this course unless both EDKP 350D1 and EDKP 350D2 are successfully completed in consecutive terms) (EDKP 350D1 and EDKP 350D2 together are equivalent to EDKP 350)

EDKP 350D2 PRACTICUM 2. (1.5) (Prerequisite: EDKP 350D1) (No credit will be given for this course unless both EDKP 350D1 and EDKP 350D2 are successfully completed in consecutive terms) (EDKP 350D1 and EDKP 350D2 together are equivalent to EDKP 350)

● † **EDKP 371 ALTERNATIVE FIELD EXPERIENCE.** (3) (Prerequisite: EDFE 246)

● **EDKP 371D1 ALTERNATIVE FIELD EXPERIENCE.** (1.5)

● **EDKP 371D2 ALTERNATIVE FIELD EXPERIENCE.** (1.5)

▲ **EDKP 391 ERGO-PHYSIOLOGY.** (3) (Prerequisite: EDKP 331) Emphasis is on human organic adaptability; acute and chronic adaptive mechanisms to exercise and other environmental stresses are analysed. A laboratory program is included to evaluate (measure and predict) adaptive capacity and assess factors affecting it.

● **EDKP 393 SKILL LEARNING AND EXPERTISE.** (3) (Prerequisite: EDKP 261) (Not open to students who have taken EDKP 492)

● **EDKP 394 HISTORICAL PERSPECTIVES.** (3)

EDKP 396 ADAPTED PHYSICAL ACTIVITY. (3) (Not open to students who have taken EDKP 496) Assessment, instruction and evaluation in physical activity for special populations. Emphasis on inclusion of people labelled intellectually disabled, learning disabled, physically awkward, autistic, visually or hearing impaired and physically disabled. Weekly lectures plus practical teaching lab.

EDKP 400 SPECIAL TOPICS. (3)

EDKP 442 PHYSICAL EDUCATION PEDAGOGY. (3) (Prerequisites: EDKP 342, EDFE 246 and EDFE 373) This pedagogy course builds on physical education methods and field experiences. It focuses on the developing teacher, the establishment of the learning environment, and the implementation of the varied teaching strategies. Principles of research on teaching in physical education are translated into practical techniques for application in the field.

† **EDKP 450 PRACTICUM 3.** (3) (Prerequisites: EDKP 250 and EDKP 350) A work-study experience with a focus on administration and program development in fitness. Work will be in a community placement under a qualified sponsor selected with the approval of the Department.

Also offered as:

EDKP 450D1 PRACTICUM 3. (1.5)

EDKP 450D2 PRACTICUM 3. (1.5) (Prerequisite: EDKP 450D1)

EDKP 451 PERSONAL TRAINER PRACTICUM. (3)

EDKP 451D1 PERSONAL TRAINER PRACTICUM. (1.5) (Students must also register for EDKP 451D2) (No credit will be given for this course unless both EDKP 451D1 and EDKP 451D2 are successfully completed in consecutive terms) (EDKP 451D1 and EDKP 451D2 together are equivalent to EDKP 451)

EDKP 451D2 PERSONAL TRAINER PRACTICUM. (1.5) (Prerequisite: EDKP 451D1) (No credit will be given for this course unless both EDKP 451D1 and EDKP 451D2 are successfully completed in consecutive terms) (EDKP 451D1 and EDKP 451D2 together are equivalent to EDKP 451)

EDKP 452 FITNESS APPRAISAL PRACTICUM. (3)

EDKP 452D1 FITNESS APPRAISAL PRACTICUM. (1.5)

EDKP 452D2 FITNESS APPRAISAL PRACTICUM. (1.5) See EDKP 452D1 for course description.

● **EDKP 453 RESEARCH PRACTICUM IN KINESIOLOGY.** (3) (Restriction: Open to Kinesiology students only.) (Prerequisites: EDKP 206, EDKP 391, EDKP 492.)

● **EDKP 453D1 RESEARCH PRACTICUM IN KINESIOLOGY.** (1.5) (Restriction: Open to Kinesiology students only.) (Prerequisites: EDKP 206, EDKP 391, EDKP 492.)

● **EDKP 453D2 RESEARCH PRACTICUM IN KINESIOLOGY.** (1.5) (Restrictions: Open to Kinesiology students only.) (Prerequisite: EDKP 453D1)

▲ **EDKP 485 EXERCISE: CHRONIC HEALTH CONDITIONS.** (3) (Prerequisites: EDKP 331 and EDKP 391) The course briefly reviews the physiological basis of pregnancy, aging as well as selected metabolic, cardiovascular and respiratory disorders and examines the particularities of the exercise response and the effects of exercise conditioning in these populations. A special emphasis is placed on the scientific basis for exercise prescription.

▲ **EDKP 492 PSYCHOLOGY OF MOTOR PERFORMANCE.** (3) This course is concerned with selected psychological factors in terms of their relationship to the acquisition of motor skills, that is, how they affect the skill acquisition of the individual and how the activity patterns of the individual affect the psychological factors.

EDKP 493 ADMINISTRATION. (3) Organization and administration of physical education programs in various settings with emphasis on common problems relating to management practices of centres offering physical activity. Topics include facilities and equipment, fiscal considerations, liability and program planning.

† **EDKP 494 PHYSICAL EDUCATION CURRICULUM DEVELOPMENT.** (3) (Prerequisite: EDFE 373 or equivalent) Analysis of important philosophies, principles, and personal, educational, and societal issues that influence current physical and health education curricula.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ula with particular emphasis on the Québec curriculum for Physical Education and Health.

▲ **EDKP 495 SCIENTIFIC PRINCIPLES OF TRAINING.** (3) (Prerequisites: EDKP 331 and EDKP 391) Application of physiological and kinesiological principles in the selection and evaluation of athletic and physical fitness programs. Specific topics studied will include aerobic and anaerobic training, interval training, circuit training, weight training for muscular strength and endurance, flexibility, motor ability, obesity and energy balance.

● ▲ **EDKP 496 ADAPTED PHYSICAL ACTIVITY.** (3) (Prerequisite: EDKP 342 or EDKP 201)

▲ **EDKP 498 SPORT PSYCHOLOGY.** (3) (Prerequisite: EDKP 261 and EDKP 393) The psychological aspects of participation in sport and physical activity relative to performance enhancement.

● **EDKP 502 SELECTED ISSUES.** (3) (Undergraduate students require instructor's permission prior to registration.)

● **EDKP 505 SPORT AND PHYSICAL EDUCATION IN SOCIETY.**(3)

EDKP 550 ANALYZING INSTRUCTIONAL BEHAVIORS. (3) Students will investigate generic and specialized data collection instruments used in the supervision of and research into teaching and coaching. Practical experience will include the selection and use of appropriate tools, establishment of observer reliability, critical analysis of observational systems, and application of systematic observation to pertinent research questions.

● **EDKP 553 PHYSIOLOGICAL ASSESSMENT: SPORT.** (3)

EDKP 566 BIOMECHANICAL ASSESSMENT IN SPORT. (3) Various equipment and protocols will be used to evaluate the biomechanics of skilled movement patterns. Kinematic, kinetic, and electromyographic data will be collected, processed and interpreted to identify optimal performance features related to equipment design and individual technique. Each student will be required to complete a series of research projects and literature summaries.

EDPC – Ed Psych & Couns (Counselling)

Offered by: Department of Educational & Counselling Psychology
Former Teaching Unit Code: 412

EDPC 501 HELPING RELATIONSHIPS. (3) (Priority given to Educational and Counselling Psychology students.) A course in the basic principles of human relationships and communication skills, approached from a theoretical and experimental viewpoint. An emphasis will be given to training in basic listening skills, interviewing techniques, and the interpretation of non-verbal behaviour and communication.

EDPC 502 GROUP PROCESSES AND INDIVIDUALS. (3) A laboratory course in which participants observe individual dynamics within a group setting as well as understand the developmental phases of the group. Participants will be encouraged to experiment with their own behaviour, in order to increase their own awareness of functioning.

EDPC 503 HUMAN SEXUALITY: PROFESSIONALS. (3) Historical, biological, anthropological, psychological and sociological perspectives of human sexual development. Sexual dysfunctions and approaches to sex therapy. Attitudes toward sexuality held by professional helpers relative to their implications for the learning and teaching of human sexuality and sex therapy.

EDPC 504 PRACTICUM: INTERVIEWING SKILLS. (3) (Prerequisite: EDPC 501) This course will enable students to become practitioners in the field of Applied Social Sciences. Theoretical principles of the helping relationship will be applied in particular situations. Demonstration, lecture, role-playing and psychodrama techniques will be used.

EDPC 505 CRISIS INTERVENTION PROCESSES. (3) Instruction in the skills of working with crisis situations involving persons emotionally disturbed, suicidal, or alcoholic, and those who are on drugs or experiencing emotional trauma, as well as other problems. Atten-

tion will be given to identification of referral sources and the writing of reports.

EDPC 507 PRACTICUM: GROUP LEADERSHIP SKILLS. (3) (Prerequisite: EDPC 502) The practical aspects of group leadership, group design and planning. Candidates will set up groups, conduct such groups over a number of sessions, and assess these groups according to the theoretical models covered in the prerequisite course.

EDPC 508 SEMINAR IN SPECIAL TOPICS. (3) (Permission must be obtained from the Department before registration) (Open to Educational and Counselling Psychology students.) Content will vary from year to year and will be announced prior to registration. The seminar may be given by a single instructor or by a group, as the occasion warrants.

EDPC 509 INDIVIDUAL READING COURSE. (3) (Permission of Program Director required) (By arrangement with individual instructor.)

EDPC 510 FAMILY LIFE EDUCATION AND MARRIAGE. (3) The contribution of central concepts of psychological theories and therapeutic systems to the understanding of marriage and relationships. Special attention will be given to gender and ethnicity issues in order to increase the sensitivity of students to the issues typically confronted in the modern marriage and family.

● **EDPC 540 FAMILY LIFE EDUCATION.** (3) (Not open to students who have taken EDPC 640)

EDPC 542 COUNSELLING ROLE OF THE TEACHER. (3) Theory and practice in interpersonal communication, interviewing, group dynamics, group leadership management, and referral criteria and procedures for students with developmental problems who experience trauma or crisis. Addressed primarily to elementary and secondary teachers who combine instructional responsibilities with a supportive role in school guidance and counselling activities.

EDPC 562 CAREER EDUCATION AND GUIDANCE. (3) A review of career education and guidance programs that refer to the subject matter and related methods and techniques designed to foster the intellectual development of career awareness, career planning, career decision-making, and the necessary career-resilient employability skills for the school-to-work transition.

EDPE – Ed Psych & Couns (Psychology)

Offered by: Department of Educational & Counselling Psychology
Former Teaching Unit Code: 416

EDPE 208 PERSONALITY AND SOCIAL DEVELOPMENT. (3) (Not available for Psychology Major students or any student who has taken or is required to take PSYC 304 in the Psychology Department) Personality, social behavior, and moral development from nursery school up to, but not including, adolescence. Emphasis on aspects of personality and social development that are related to the process of schooling.

● **EDPE 214D1 CHILD DEVELOPMENT.** (3) (Students must also register for EDPE 214D2)

● **EDPE 214D2 CHILD DEVELOPMENT.** (3) (Prerequisite: EDPE 214D1)

EDPE 250 SECOND YEAR PROFESSIONAL SEMINAR. (1) (Prerequisites: EDEC 201 and EDFE 200. Corequisite: EDFE 251) (Open to B.Ed. Secondary students only) Individual differences in teaching and learning, learning styles, strategies for accommodating individual differences, coaching and tutoring individuals and small groups, peer teaching and tutoring.

EDPE 251 SECOND YEAR PROFESSIONAL SEMINAR (K/ELEM). (1) (Prerequisites: EDFE 200 and EDEC 201. Corequisite: EDFE 252) (Open to B.Ed. K/Elem. students only) The seminar, which accompanies the early childhood teaching experience, will focus on individual differences in teaching and learning, learning styles, strategies for accommodating individual differences in an early childhood setting.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

EDPE 300 EDUCATIONAL PSYCHOLOGY. (3) Selected theories, models, and concepts relevant to planning and reflecting upon educational practice and improvement. Overview of development, learning, thinking, motivation, individual difference, etc. In relation to applications in classroom teaching and learning, the complementary role of counsellors and psychologists, educational computing and technology. The Youth Protection Act.

☐ ▲ * **EDPE 304 MEASUREMENT AND EVALUATION.** (3) The purposes of examinations. Causes of complaints about examinations. Equalizing means and dispersions in distribution of marks. Standardized scores. The percentile system. Essay and objective-type examinations. Taxonomies of educational objectives. Validity and reliability: item analysis.

● ▲ **EDPE 310 EDUCATIONAL COMPUTER APPLICATIONS.** (3)

EDPE 320 ADULT LEARNING AND TEACHING.(3) (Offered through Continuing Education) (Also offered as part of the Business and Industrial Trainer Development Program) The application of theories of learning to adult learners. Developing effective teaching strategies for use with adult learners. Managing adult learning systems. Special characteristics of the adult learners.

EDPE 335 INSTRUCTIONAL PSYCHOLOGY. (3) (Prerequisites: An introductory course in psychology or EDPE 300) Psychological processes in instruction and learning, assessment, and curriculum design, based on theories of cognition, motivation, and the social context of instruction.

EDPE 355 COGNITION AND EDUCATION. (3) (Prerequisites: PSYC 213 or permission of the instructor) Cognition and learning in educational domains and contexts. Contributions of cognitive science to issues in education including domain-specific and general knowledge and expertise, situated cognition and learning, cognitive apprenticeship, and uses of computers and networks as cognitive tools in educational settings.

EDPE 377 ADOLESCENCE AND EDUCATION. (3) (May be offered through Continuing Education and Summer Studies) Development of personality and social behaviour in adolescence. Problems relating to self-concept, academic achievement, relationships with others, and development of values in a changing culture. Some attention to current criticisms of the school as an agency involved in adolescent development.

● **EDPE 495 INDIVIDUAL READING COURSE.** (3) (By arrangement with individual instructor. Permission must be obtained from the Department before registration)

● † **EDPE 496 INDIVIDUAL READING COURSE.** (3) (By arrangement with individual instructor. Permission must be obtained from the Department before registration)

EDPE 510 LEARNING AND TECHNOLOGY. (3) Impact of virtual learning communities on learners/teachers in formal schooling and beyond. Information technologies as a resource to enhance learning experiences, creative/critical thinking. Principles of internet design, authoring, management. Evaluation of computer-based information quality and strategies for efficient and effective use of the technology in education and society.

● **EDPE 515 GENDER IDENTITY DEVELOPMENT.** (3) (Prerequisites: EDPE 208, EDPE 300 or a course in developmental psychology)

† **EDPE 535 INSTRUCTIONAL DESIGN.** (3) This course draws on the fields of learning theory, developmental psychology, and measurement to focus on the tasks of constructing instructional materials. Areas to be considered include behaviour analysis, concept formation, and test construction.

EDPE 555 APPLIED COGNITIVE SCIENCE. (3) Examination of foundations of cognitive science including contributions by psychology, linguistics, and computer science. Consideration of theory and methodology or cognitive science in educational and instructional contexts.

EDPE 560 HUMAN DEVELOPMENT. (3) A review of current theory and knowledge of human development through the life cycle. Particular attention is given to emotional and social development. All major age-stages are considered. Emphasis is placed on the

effects of interaction between individuals of these different age groupings.

● **EDPE 564 FAMILY COMMUNICATION.** (3) (May be offered through Summer Studies)

EDPE 575 EDUCATIONAL MEASUREMENT. (3) (Also offered through Summer Studies) Statistical measurements in education, graphs, charts, frequency distributions, central tendencies, dispersion, correlation, and sampling errors.

● ☐ **EDPE 595 SEMINAR IN SPECIAL TOPICS.** (3) (Permission must be obtained from the Department before registration.)

● **EDPE 596 SEMINAR IN SPECIAL TOPICS.** (3)

EDPH – Ed Psych & Couns (Collegial)

Offered by: Department of Educational & Counselling Psychology
Former Teaching Unit Code: 449

● **EDPH 582 HIGHER EDUCATION THEORY/POLICY.** (3)

● **EDPH 588 HIGHER EDUCATION ENVIRONMENT.** (3)

EDPI – Ed Psych & Couns (Inclusive)

Offered by: Department of Educational & Counselling Psychology
Former Teaching Unit Code: 414

EDPI 211 SOCIAL AND EMOTIONAL DEVELOPMENT. (3) (Offered through Continuing Education. Limited to students enrolled in programs offered by the Office of First Nations and Inuit Education) Intensive training in observation of the development and behaviour of children as individuals and as members of modern First Nations or Inuit society. Study of educational implications of both common and divergent behaviour. Development of relevant teaching practices.

EDPI 212 PERCEPTUAL MOTOR DEVELOPMENT. (3) (Offered through Continuing Education. Limited to students enrolled in programs offered by the Office of First Nations and Inuit Education) Observation of perceptual-motor aspects of child development at the pre-school and elementary levels. Application of observations to teaching methods and materials, curriculum, classroom management and evaluation.

EDPI 309 EXCEPTIONAL STUDENTS. (3) (Prerequisite: EDPE 300 or equivalent. Open to B.Ed. and Concurrent students only.) (May be offered through Continuing Education) Evolution of special education to inclusive education; characteristics, teaching practices, and teachers' roles in inclusive classrooms. Overview of characteristics, causes, needs, and teaching strategies for students with each exceptionality, including students with intellectual, emotional, behavioral, sensory, physical and learning differences.

EDPI 341 INSTRUCTION IN INCLUSIVE SCHOOLS. (3) (Open to B.Ed. students only) Planning, implementing and evaluating curriculum and instruction for students with exceptionalities. Using technology and adapting curriculum and instruction for learners with varying abilities, learning styles, and needs. Collaboration with students, families, and other educators in the instructional process. Application component: application of instructional modifications for exceptional students in inclusive schools.

EDPI 344 ASSESSMENT FOR INSTRUCTION. (3) Assessing student strengths, problems and needs; functions and use of different types of student assessment (traditional and alternative assessments); assessing the classroom environment; issues in assessment. Application component: application of assessment process with exceptional students, and use of results for planning and adapting instruction.

EDPI 440 MANAGING THE INCLUSIVE CLASSROOM. (3) (May be offered through Continuing Education or Summer Studies) Comprehensive approach to classroom management, including management of student learning and behavior, classroom environment, material and human resources, and teacher growth. Focus on research-based practices, including behavioral approaches, for

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

effectively managing a classroom with diversity of students. Application component: application of classroom management principles in the field.

EDPI 441 STUDENTS WITH BEHAVIOR DIFFICULTIES. (3) (May be offered through Continuing Education) Theoretical approaches and specific teaching methods appropriate to the needs of students with emotional or behavior problems, including students with attention deficit hyperactivity disorder. Multimodal team intervention approaches are emphasized. Application component: application of teaching methods with students experiencing behavior difficulties.

● **EDPI 442 STUDENTS WITH LEARNING DIFFICULTIES.** (3) (Offered through Summer Studies)

● **EDPI 447 SPECIAL TOPICS.** (3)

EDPI 450 COMPUTERS AND SPECIAL NEEDS. (3) (May be offered through Continuing Education) Overview of the role and contribution of computers in relation to students with exceptionalities. Review of instructional uses of computers, applications for modifying and teaching curriculum applications for specific learning needs, assistive devices for students with sensory and physical disabilities, and resources for students and teachers.

EDPI 526 TALENTED AND GIFTED STUDENTS. (3) (May be offered through Continuing Education) The psychology and education of exceptionally able children. Definitions, assessment, classroom adaptations, technology, educational programs and educational issues. The course combines theoretical background and practical concerns. Application component: application of teaching methods with exceptionally able students.

EDPI 527 CREATIVITY AND ITS CULTIVATION. (3) (May be offered through Continuing Education) Recent research, theory, and educational practice concerning creativity, with special attention to creativity in students and educational settings.

● **EDPI 536 PRACTICUM GIFTED EDUCATION 1.** (3) (Prerequisite: EDPI 526) (Normally available in July only and offered concurrently with EDPI 537 during the Gifted Summer School) (Permission to register is required from the Gifted Summer School)

● **EDPI 537 PRACTICUM GIFTED EDUCATION 2.** (3) (Prerequisite: EDPI 526) (Normally taken with EDPI 536. Permission is required to register)

EDPI 539 FIELD WORK 1: EXCEPTIONAL STUDENTS. (3) (Open only to Education students with permission of Program Director) Supervised experience with exceptional students in an approved educational setting.

EDPI 540 FIELD WORK 2: EXCEPTIONAL STUDENTS. (3) (Prerequisite: EDPI 539) (Open only to Education students with permission of Program Director) Supervised experience with exceptional students in an approved educational setting.

● **EDPI 543 FAMILY, SCHOOL AND COMMUNITY.** (3) (Formerly 414-443) (Offered in Summer Studies)

EDPT – Ed Psych & Couns (Media)

Offered by: Department of Educational & Counselling Psychology
Former Teaching Unit Code: 432

☐ **▲ EDPT 200 APPLICATIONS SOFTWARE.** (3) (Also offered through Continuing Education) Applications Software is the "gateway" course to educational computing. It introduces novices to basic computing skills, using a printer, word processing, data bases and spreadsheets. Assignments and projects focus on educational applications by teachers and students.

▲ EDPT 204 EDUCATIONAL MEDIA 1. (3) (Offered through Continuing Education) Educational Media 1 is the "gateway" course for educational media. It reviews audio-visual education and emphasizes the rationale for audio-visual materials in education, and the underlying principles in their design, production and effective use.

● **▲ EDPT 300 SPREADSHEETS AND CHARTING.** (3) (Prerequisite: EDPT 200) (Offered only through Distance Education) This

course explores the techniques and educational applications of spreadsheets and simple charting.

▲ EDPT 348 EDUCATIONAL SOFTWARE. (3) (Prerequisites: EDPT 200 and EDPT 315) (Offered only through Distance Education) This course explores the approaches taken by different software packages, their educational applications and the management of multi-media based learning resources. Students develop and apply evaluation criteria for software selection, design teaching units incorporating educational software, and devise plans for integrating multi-media into the school curriculum.

● **▲ † EDPT 405 INDEPENDENT PROJECT.** (6)

● **EDPT 409 SPECIAL TOPICS.** (3) (Offered only through Distance Education)

▲ EDPT 420 MEDIA LITERACY FOR EDUCATION. (3) (Prerequisite: EDPT 204) (Offered only through Distance Education) The course explores the pedagogical use of media and multi-media in the classroom, and focuses in particular on the text, audience and production of media in a media literacy and integrated language arts program.

EDSL – Education In Second Languages

Offered by: Department of Integrated Studies in Education
Former Teaching Unit Code: 431

● **EDSL 209 FIRST YEAR PROFESSIONAL SEMINAR.** (1) (Corequisite: EDFE 209)

EDSL 210 FIRST PROFESSIONAL SEMINAR. (1) (Corequisite: EDFE 209) (Restriction: Not open to students who have taken EDSL 209 (First Year Professional Seminar)) How to observe in second language classrooms. Students will be introduced to ways of observing instructional practices and procedures and will begin to reflect on various interactional patterns between teachers and students as observed in the First Year Field Experience.

● **▲ EDSL 247 SECOND LANGUAGE EDUCATION IN ABORIGINAL COMMUNITIES.** (3) (Limited to students enrolled in off-campus programs delivered through the Office of First Nations and Inuit Education)

EDSL 255 SECOND PROFESSIONAL SEMINAR. (2) (Restrictions: Open to B.Ed (TESL) students. Not open to students who have taken EDSL 259 (Second Year Professional Seminar).) (Prerequisites: EDSL 210 and EDFE 209.) The course aims to develop basic practices in planning and teaching in ESL classrooms, including microteaching and reflective analysis.

EDSL 259 SECOND YEAR PROFESSIONAL SEMINAR. (1) (Prerequisite: EDSL 209. Corequisite: EDFE 259) The professional seminar is held in conjunction with the Second Year Field Experience and allows for reflection on how various teaching strategies respond to a variety of learning styles in L2 classrooms.

EDSL 260 SÉMINAIRE PROFESSIONNEL-2E. (1) (Prerequisite: EDFE 260) (Corequisite: EDFE 261, EDSL 444) Analyse réflexive des pratiques d'enseignement propres à l'assistantat.

EDSL 262 SYSTÈME ÉDUCATIF - PROFESSION ENSEIGNANTE. (3) (Not open to students who have taken UdeM: ETA 1900, McGill: EDEM 405.) Initiation aux institutions scolaires du Québec et, au premier chef, à l'école. Initiation au rôle professionnel des enseignants. Perspectives historique et contemporaine.

EDSL 263 APPRENTISSAGE ET DÉVELOPPEMENT. (3) (Not open to students who have taken UdeM: PPA 1100.) Théories de l'apprentissage scolaire. L'enseignant comme médiateur des apprentissages. Milieu scolaire et croissance de 4 à 12 ans. Entrée à l'école. Facteurs d'adaptation scolaire et sociale. Élèves à besoins particuliers.

EDSL 264 PHONÉTIQUE ET PHONOLOGIE. (3) (Not open to students who have taken UdeM: LNG 1400.) Introduction à la phonétique et à la phonologie. Techniques d'analyse et de description.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

● **EDSL 265 ACQUISITION-APPRENTISSAGE-LANGUES SECONDES.** (3) (Not open to students who have taken UdeM: DID 2102, McGill: EDSL 305.)

● **EDSL 266 MATHÉMATIQUES AU PRIMAIRE.** (3) (Not open to students who have taken UdeM: DID 1500.)

● **EDSL 267 DIDACTIQUE DES ARTS PLASTIQUES 1.** (3) (Not open to students who have taken UdeM: DID 2910.)

● **EDSL 268 INTÉGRATION DES TIC.** (3) (Not open to students who have taken UdeM: PPA 2103.)

● **EDSL 269 ÉCOLE ET ENVIRONNEMENT SOCIAL.** (3) (Not open to students who have taken UdeM: ETA 2200.)

EDSL 270 MORPHOLOGIE ET SYNTAXE. (3) (Not open to students who have taken UdeM: LNG 1540.) Principaux concepts et méthodes de l'analyse morphologique et syntaxique en grammaire générative transformationnelle. Application à la structure du mot et de la phrase en français contemporain et analyse de constructions problématiques.

EDSL 271 LEXIQUE ET SÉMANTIQUE. (3) (Restriction: Not open to students who have taken UdeM: LNG 1080) Types de sens: prédicats et objets sémantiques. Sens lexicaux vs grammaticaux; notion d'unité lexicale; lexique vs grammaire. Relations sémantiques de base (synonymie, antonymie...).

▲ **EDSL 300 FOUNDATIONS OF L2 EDUCATION.** (3) This introduction to the field of second language education provides an overview of the supporting disciplines (e.g., linguistics, psychology, sociology and education) and includes historical and analytical perspectives on the development of L2 teaching through an examination of approaches to L2 instruction and specific teaching methods.

EDSL 301 ÉTUDE DE LA LANGUE. (3) (Not for credit if EDSL 311 or EDEC 302 has been or is being taken) Notions de base pour l'enseignement des composantes linguistique (lexique, morphologie, syntaxe et sémantique) et discursive (de la phrase aux types de textes et de discours); apprentissage de la grammaire nouvelle; composante langue des programmes d'études.

▲ **EDSL 304 SOCIOLINGUISTICS AND L2 EDUCATION.** (3) (May be offered in English or French) This course introduces students to various social aspects of language, language use, and language learning by examining second language education from three inter-related perspectives: sociolinguistics, discourse, and culture. Issues range from language variation and social attitudes to conversational analysis and cross-cultural communication.

▲ **EDSL 305 L2 LEARNING: CLASSROOM SETTINGS.** (3) (Prerequisite: EDSL 300) This course provides an introduction to theory and research in second language acquisition (SLA). It is designed to help students understand the processes, developmental patterns and factors contributing to SLA so that the students will be prepared to evaluate and develop teaching procedures in light of this understanding.

EDSL 309 SÉMINAIRE PROFESSIONNEL-3E. (3) (Prerequisite: EDSL 259 and EDFE 261. Corequisite: EDFE 472.) Séminaire sur la réflexive des pratiques d'enseignement propres au secondaire.

● **EDSL 310 THIRD PROFESSIONAL SEMINAR.** (3) (Prerequisite: EDSL 255. Corequisite: EDFE 359) (Restriction: Not open to students who have taken EDSL 309)

EDSL 311 LANGUAGE STUDY FOR ESL TEACHERS. (3) (Prerequisite: EDSL 350) (Not for credit if EDSL 301 or EDEC 302 has been or is being taken) The course focuses on how the English language works as a system, examining it from the levels of phonology, morphology, syntax, semantics, and discourse. These aspects will be considered in relation to second language teaching and learning.

EDSL 319 SÉMINAIRE PROFESSIONNEL 3. (3) Ce séminaire professionnel porte sur l'analyse réflexive des pratiques stratégiques d'enseignement propres aux divers contextes scolaires au primaire. Ce séminaire vise également l'expérimentation de divers matériels pédagogiques et la simulation de techniques d'animation et de gestion de classe.

● **EDSL 320 SÉMINAIRE 3 PROFESSIONNEL.** (1)

EDSL 330 L2 LITERACY DEVELOPMENT. (3) This course examines current theories of second language literacy development and their implications for teaching, including the use of literature as a tool for language learning. Key issues include the nature of literacy development, reading and writing processes, and appropriate pedagogical approaches.

● ▲ **EDSL 341 LITTÉRATURE JEUNESSE EN FLS.** (3)

EDSL 345 ENSEIGNEMENT DU FLS-IMMERSION. (3) Ce cours examine divers cheminements retrouvés en contexte immersif ainsi que diverses approches pédagogiques propres à l'enseignement du FLS par le biais de matières scolaires. Des recherches effectuées en contexte immersif seront également examinées par rapport au développement langagier des élèves en immersion.

● **EDSL 346 TFSL IN LATE IMMERSION CLASSES.** (3)

EDSL 350 ESSENTIALS OF ENGLISH GRAMMAR. (3) (Restriction: Restricted to B.Ed. (TESL) students) (Restriction: This is a required course for B.Ed. TESL students. Students from other programs may be admitted at the discretion of the instructor.) Analysis of English phrases, clauses and sentences up to discourse level in connected text. Emphasis on distinguishing between grammatical form, meaning, and function. Identification, analysis and correction of common errors made by ESL learners.

EDSL 360 TESL/TFSL PRACTICUM - ELEMENTARY. (3) (Corequisites: EDSL 444 for TFSL students; EDSL 447 for TESL students) (Offered through Continuing Education) Supervised practice in the application of language teaching and learning theories: focus on the design and use of teaching units, the organization of communication activities, the selection and use of diagnostic and remedial materials.

EDSL 361 TESL/TFSL PRACTICUM - SECONDARY. (3) (Corequisites: EDSL 472 for TFSL students; EDSL 458 for TESL students) (Offered through Continuing Education) Supervised practice in the application of language teaching and learning theories: focus on curriculum development, and on the production of instructional, diagnostic and remedial materials.

● ◆ ▲ **EDSL 381 YOUNG ADULT LIT. STUDENTS LEARNING FSL.** (3)

● **EDSL 391 DIDACTIQUE DU FRANÇAIS EN ACCUEIL 1.** (3) (Prerequisite: EDSL 301.)

● **EDSL 392 GESTION DE CLASSE EN LANGUES SECONDES.** (3) (Not open to students who have taken UdeM: PPA 3222.)

● **EDSL 393 ADOLESCENT ET EXPÉRIENCE SCOLAIRE.** (3) (Not open to students who have taken UdeM: PPA 1210.)

● **EDSL 394 SÉMINAIRE DE STAGE-3E.** (1) (Prerequisites: EDSL 260, EDFE 261. Corequisite: EDFE 361.) (Not open to students who have taken UdeM: EDU 3061.)

EDSL 402 ÉVALUATION EN FRANÇAIS LANGUE SECONDE. (3) Évaluation des compétences en enseignement du FLS: fonctions de l'évaluation; approches normative et critérielle; planification de situations d'évaluation authentiques; élaboration d'instruments; interprétation des résultats; modalités de consignation.

EDSL 409 FOURTH YEAR PROFESSIONAL SEMINAR. (3) (Prerequisite: EDSL 359. Corequisite: EDFE 459) The fourth-year professional seminar will provide a forum for reflection on teaching in a variety of ESL classrooms at the secondary level. A wide range of techniques and materials will be experimented with and analyzed in terms of classroom processes, including instructional strategies and classroom organization.

EDSL 412 MEASUREMENT AND EVALUATION IN TESL. (3) (Prerequisites: EDSL 447 and EDFE 359) This course deals with the role of evaluation in TESL. Students will explore the kinds of information needed to make educational decisions in second language courses, different techniques for getting that information, and ways for interpreting it. Principles and methods for evaluation with and without tests are discussed and practiced.

● **EDSL 415 FOURTH PROFESSIONAL SEMINAR.** (3) (Prerequisite: EDSL 310. Corequisite: EDFE 459) (Restriction: Not open to students who have taken EDSL 409)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

EDSL 419 SÉMINAIRE PROFESSIONNEL-4E. (3) Analyse réflexive des pratiques d'enseignement propres à l'immersion.

● **EDSL 420 SÉMINAIRE 4 PROFESSIONNEL.** (2)

EDSL 444 LABORATOIRE D'ENSEIGNEMENT EN FRANÇAIS LANGUE SECONDE. (3) Entraînement à l'observation et à l'analyse de situations d'enseignement du français langue seconde au primaire. Pratiques d'habiletés en situation microenseignement. Vidéoscopie et entraînement à la pratique réfléchie.

● **EDSL 444D1 LABORATOIRE D'ENSEIGNEMENT EN FRANÇAIS LANGUE SECONDE.** (1.5) (Students must also register for EDSL 444D2)

● **EDSL 444D2 LABORATOIRE D'ENSEIGNEMENT EN FRANÇAIS LANGUE SECONDE.** (1.5)

EDSL 447 THIRD-YEAR METHODS IN TESL. (3) (Prerequisite: EDSL 311. Corequisites: EDSL 310 and EDFE 359) Intermediate-level skills in planning and teaching appropriate lessons, activities, and projects for ESL learners in a variety of programs at the elementary and secondary school levels.

● **EDSL 447D1 THIRD-YEAR METHODS IN TESL.** (1.5) (Prerequisite: EDSL 311. Corequisites: EDSL 310 and EDFE 359) (Students must also register for EDSL 447D2)

● **EDSL 447D2 THIRD-YEAR METHODS IN TESL.** (1.5) (Prerequisite: EDSL 447D1)

● **EDSL 449 SPECIAL TOPICS IN SECOND LANGUAGE TEACHING.** (3)

EDSL 458 FOURTH-YEAR METHODS IN TESL. (3) (Prerequisite: EDSL 447, EDSL 311; Corequisites: EDSL 415 and EDFE 459) Advanced-level skills in planning appropriate lessons, activities, units and projects for ESL learners in a variety of programs at the elementary and secondary levels.

● **EDSL 458D1 FOURTH-YEAR METHODS IN TESL.** (1.5) (Prerequisite: EDSL 447, EDSL 311; Corequisites: EDSL 415 and EDFE 459)

● **EDSL 458D2 FOURTH-YEAR METHODS IN TESL.** (1.5) (Prerequisite: EDSL 458D1)

EDSL 472 ENSEIGNEMENT DU FRANÇAIS LANGUE SECONDE-SECONDAIRE. (3) Le but de ce cours est de développer l'habileté à planifier des activités, des unités et des projets, dans des séquences d'enseignement, en fonction des programmes d'études: FLS, immersion et accueil. Le cours intègre les pédagogies de la communication orale et écrite de la langue seconde au secondaire.

● **EDSL 472D1 ENSEIGNEMENT DU FRANÇAIS LANGUE SECONDE-SECONDAIRE.** (1.5) (Students must also register for EDSL 472D2)

● **EDSL 472D2 ENSEIGNEMENT DU FRANÇAIS LANGUE SECONDE-SECONDAIRE.** (1.5)

● **EDSL 490 SPECIAL PROJECT.** (2)

● **EDSL 490D1 SPECIAL PROJECT.** (1) (Students must also register for EDSL 490D2)

● **EDSL 490D2 SPECIAL PROJECT.** (1) (Prerequisite: EDSL 490D1)

● **EDSL 491 DIDACTIQUE DES MATHÉMATIQUES EN LANGUES SECONDES.** (3) (Not open to students who have taken UdeM: DID 3506.)

● **EDSL 492 DIDACTIQUE DES SCIENCES-TECHNOLOGIES.** (3) (Not open to students who have taken UdeM: DID 1700.) Apprentissages propres aux sciences et à la technologie au préscolaire au primaire. Conception des élèves et démarche didactique. Résolution de problèmes et autres activités. Évaluation des apprentissages et du curriculum.

● **EDSL 493 SCIENCES HUMAINES AU PRIMAIRE.** (3) (Not open to students who have taken UdeM: DID 2205.)

● **EDSL 494 DIDACTIQUE DE L'UNIVERS SOCIAL ET TIC.** (3) (Not open to students who have taken UdeM: DID 3410.)

● **EDSL 495 RECHERCHE-RÉSOLUTION DE PROBLÈMES.** (3) (Not open to students who have taken UdeM: ETA 4000.)

● **EDSL 496 LABORATOIRE DE FORMATION PROFESSIONNELLE.** (3) (Not open to students who have taken UdeM: ETA 4410.)

● **EDSL 497 PROBLÉMATIQUE EN ÉDUCATION PRÉSCOLAIRE.** (3) (Not open to students who have taken UdeM: PPA 1205.)

● **EDSL 498 DIDACTIQUE DU FRANÇAIS EN ACCUEIL 2.** (3) (Prerequisite: EDSL 391.) (Not open to students who have taken UdeM: DID 4214.)

● **EDSL 499 SÉMINAIRE DE STAGE-4E.** (2) (Prerequisites: EDSL 394, EDFE 361. Corequisite: EDFE 460.) (Not open to students who have taken UdeM: EDU 4061.)

□ **EDSL 506 COMPUTER/INTERNET AND L2 LEARNING.** (3) Theoretical principles, models and empirical findings relevant to computer aided language learning (CALL); review and analysis of existing CALL programs, Internet resources, and multi-media technology for second language education. Application component included.

Faculty of Engineering

ARCH – Architecture

Offered by: School of Architecture
Former Teaching Unit Code: 301

A limited number of courses are open to students not registered in the School of Architecture. Please consult class schedule for further information.

ARCH 201 COMMUNICATION, BEHAVIOUR AND ARCHITECTURE. (6) (2-10-6) Introduction to design; development of design judgement and communication skills in a series of exercises addressing light, scale, space, form and colour in the built environment; introduction to techniques of oral and graphic presentation, including model making, photography, sketching and architectural drawing. The course is based in the studio and includes lectures, seminars and field trips.

ARCH 202 ARCHITECTURAL GRAPHICS AND ELEMENTS OF DESIGN. (6) (2-10-6) (Prerequisite: ARCH 201) Introduction to architectural design; consideration of building form in relation to program, structural system, material selection, site and climate; further development of skills in model making, conventional architectural drawing, axonometric and perspective drawing, sketching and architectural rendering. The course is based in the studio and includes lectures, seminars and field trips.

ARCH 217 FREEHAND DRAWING 1. (1) (0-3-0) Drawing in pencil and charcoal.

ARCH 218 FREEHAND DRAWING 2. (1) (0-3-0) (Prerequisite: ARCH 217) A continuation of course ARCH 217.

ARCH 240 ORGANIZATION OF MATERIALS IN BUILDINGS. (3) (2-3-4) The characteristics of basic building materials: wood, steel, masonry and concrete. How building materials are shaped into building components, and how these components are integrated into the building envelope. Problems, laboratory projects and field trips to illustrate principles.

ARCH 250 ARCHITECTURAL HISTORY 1. (3) (3-0-6) The study of architecture in relation to landscape, urban form and culture, from Antiquity to the end of the Middle Ages.

ARCH 251 ARCHITECTURAL HISTORY 2. (3) (3-0-6) (Prerequisite: ARCH 250) Overview of early 20th century architecture with emphasis on a thematic approach to buildings and cities, architects and ideologies. The lectures will examine the origins, development and impact of canonical figures and buildings of Modernism.

ARCH 303 DESIGN AND CONSTRUCTION 1. (6) (2-10-6) (Prerequisite: ARCH 202) An exploration of the design of buildings. Projects emphasize the major social, technological, environmental, and symbolic aspects of the design process. Introduction to specific

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

modelling, presentation, and documentation techniques. Discussions, readings, field trips and practical exercises.

ARCH 304 DESIGN AND CONSTRUCTION 2. (6) (2-10-6) (Prerequisite: ARCH 303) Continuation of Design and Construction I with projects of increasing complexity. Projects deal with particular aspects of architectural design and/or explore approaches to design methodology. Discussions, readings, field trips and practical exercises.

● □ **ARCH 319 THE CAMERA AND PERCEPTION.** (3) (2-4-3) (Prerequisite: ARCH 202) (Departmental permission required)

ARCH 321 FREEHAND DRAWING 3. (1) (0-3-0) (Prerequisite: ARCH 218) A continuation of course ARCH 218.

ARCH 322 FREEHAND DRAWING 4. (1) (0-3-0) (Prerequisite: ARCH 321) A continuation of course ARCH 321.

ARCH 324 SKETCHING SCHOOL 1. (1) (0-0-3) (Prerequisite: ARCH 218) An eight-day supervised field trip in the late summer to sketch places or things having specific visual characteristics. Students are required to include Sketching School I in the B.Sc.(Arch.) program.

ARCH 350 THE MATERIAL CULTURE OF CANADA. (3) (2-1-6) A study of Material Culture in Canada, the "stuff" of our lives; using a multi-disciplinary approach to the interpretation of the non-textual materials which have shaped the lives of past and present Canadians, using the resources of the McCord Museum and other Montreal museums, galleries and collections.

□ **ARCH 352 ART AND THEORY OF HOUSE DESIGN.** (3) (2-2-5) (Prerequisite: ARCH 202 or permission of instructor) An examination of the art and theory of the design of houses by architects who developed the form to perfection. Lectures and field trips will focus on the work of selected house architects from antiquity to the present.

ARCH 354 ARCHITECTURAL HISTORY 3. (3) (3-0-6) (Prerequisite: ARCH 250 and Arch 251) General introduction to Modern Architecture in Western Europe from the Renaissance to the end of the 19th century. The course uses a thematic approach and sources on specific ideas and works drawn particularly from Italy, France, England and Germany.

ARCH 355 ARCHITECTURAL HISTORY 4. (3) (3-0-6) (Prerequisite: ARCH 250 and ARCH 251) The study of architecture and cities in the postwar period. Emphasis placed on themes and approaches to architectural history, as opposed to traditional survey.

□ **ARCH 364 ARCHITECTURAL MODELLING.** (3) (2-1-6) (Prerequisite: ARCH 202 and ARCH 471) Architectural modeling using digital media. Topics include: advanced 3-D modeling and rendering techniques; raster and vector image editing; digital animation; hypertext and the World Wide Web; issues of representation and methodology; comparison of various publishing media.

● □ ★ **ARCH 372 HISTORY OF ARCHITECTURE IN CANADA.** (2) (2-0-4) (Prerequisite: ARCH 202) (Given alternate years, alternating with ARCH 388)

ARCH 375 LANDSCAPE. (2) (2-2-2) (Prerequisite: ARCH 202) Land form, plant life, microclimate; land use and land preservation; elements and methods of landscape design.

ARCH 377 ENERGY, ENVIRONMENT AND BUILDINGS. (2) (2-0-4) (Prerequisite: ARCH 202 or permission of instructor) Energy consumption in the built environment; architectural means to conserve energy; the potential and limitations of unconventional sources of energy; a comparative study of energy conserving buildings and their long-term environmental impact; effects of legislation and financing.

ARCH 378 SITE USAGE. (3) (2-0-7) (Prerequisite: ARCH 202 or permission of instructor) The study of the creation, form and usage of the exterior space generated in various patterns of low-rise housing. Socio-cultural aspects of patterns; exterior space as a logical extension of the living unit; social control of the use of urban and suburban land; comparative model for low-rise housing patterns.

● □ **ARCH 379 SUMMER COURSE ABROAD.** (3) (0-0-9) (Prerequisite: ARCH 202 or permission of instructor) (Departmental permission required)

● **ARCH 383 GEOMETRY AND ARCHITECTURE.** (3) (2-0-7) (Prerequisite: ARCH 202 or permission of instructor)

★ **ARCH 388 INTRODUCTION TO HISTORIC PRESERVATION.** (2) (2-2-2) (Prerequisite: ARCH 303) (Given alternate years, alternating with ARCH 372) Historic attitudes and terminologies of conservation; historic research techniques. Restoration technology of building materials and principles of interior design in the 19th and 20th centuries; current preservation planning.

ARCH 405 DESIGN AND CONSTRUCTION 3. (6) (2-10-6) (Prerequisite: ARCH 304) A structured investigation of architectural concepts; program interpretation with respect to relevant cultural, social and environmental contexts; applications of appropriate formal languages and building technologies in integrated proposals for a variety of building forms.

ARCH 406 DESIGN AND CONSTRUCTION 4. (6) (2-10-6) (Prerequisite: ARCH 405) A detailed study and comprehensive development of architectural proposals for complex building types and site conditions; the exploration of coherent initial concepts with respect to programmatic requirements, image and form; subsequent elaboration leading to meaningful and technologically viable designs for the built environment.

ARCH 410 DESIGN AND CONSTRUCTION 5. (6) A study of the function and structure of the urban environment, including surveys of selected urban areas by recording and analysing specific environmental factors. Architectural and urban design with reference to their social implications. Urban renewal and rehabilitation by means of systematic design methods. Techniques of visual communication including documentary film-making.

ARCH 447 ELECTRICAL SERVICES. (2) (2-2-2) (Prerequisite: ARCH 304) Production, measurement and control of light; design of lighting systems; electrical distribution in residential and commercial buildings; Canadian Electrical Code.

ARCH 451 BUILDING REGULATIONS AND SAFETY. (2) (2-2-2) (Prerequisite: ARCH 405) The study of building codes with specific emphasis on the National Building and National Fire Codes of Canada. Examples of existing buildings with assignments to illustrate regulations. Development of a systematic approach to the implementation of codes during the preliminary design stage of an architectural project.

ARCH 461 FREEHAND DRAWING AND SKETCHING. (1) (0-3-0) (Prerequisite: ARCH 324) Drawing and sketching in pencil, charcoal and other media both in the studio and out-of-doors.

□ **ARCH 471 COMPUTER-AIDED BUILDING DESIGN.** (2) (2-2-2) (Prerequisite: ARCH 202 or equivalent) An introduction to selected applications of interactive computing in architecture; emphasis on development of simple algorithms in graphic, as well as non-graphic, modes in hands-on situations in the lab; field trips to several in use installations.

ARCH 490 SELECTED TOPICS IN DESIGN. (2) (2-0-4) (Prerequisite: ARCH 202 or permission of instructor) A course to allow the introduction of special topics in related areas of design.

ARCH 520 MONTREAL: URBAN MORPHOLOGY. (3) (2-1-6) (Prerequisite: ARCH 251) Historical, geographical, demographical, and regional evolution of the metropolis of Montreal. Topics include: important quarters, the Montreal urban grid, industrialization, reform movements, geographical diversity, urban culture, local building techniques and materials. Basic concepts of urban morphology and their relationships to the contemporary urban context will be explored.

● **ARCH 521 STRUCTURE OF CITIES.** (3) (2-0-7) (Prerequisite: ARCH 202 or permission of instructor)

□ **ARCH 522 HISTORY OF DOMESTIC ARCHITECTURE IN QUEBEC.** (3) (2-0-7) (Prerequisite: ARCH 251) (Departmental permission required) The architecture of houses in Quebec from 1650 to the present. Distinguished buildings are reviewed from the point of view of form, style, siting and material, as influenced by climate, culture and architectural antecedents in France, England and the

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

United States. The course material is presented through alternating bi-weekly lectures and seminars.

● □ ★ **ARCH 523 SIGNIFICANT TEXTS AND BUILDINGS.** (3) (2-0-7) (Prerequisite: ARCH 251) (Alternating with ARCH 524) (Departmental permission required) Critical study of significant architectural thought since 1750 as it has been expressed in buildings and texts (treatises, manifestos, criticisms). A specific theme will be addressed every year to allow in-depth interpretations of the material presented and discussed.

● □ ★ **ARCH 524 SEMINAR ON ARCHITECTURAL CRITICISM.** (3) (2-0-7) (Prerequisite: ARCH 251) (Alternating with ARCH 523) (Departmental permission required)

□ **ARCH 525 SEMINAR ON ANALYSIS AND THEORY.** (3) (2-0-7) (Prerequisite: ARCH 202 or permission of instructor) (Departmental permission required) Analysis and evaluation of significant architectural projects with reference to contemporary architectural theories.

ARCH 526 PHILOSOPHY OF STRUCTURE. (3) (2-0-7) (Prerequisite: ARCH 202 or permission of instructor) (Not open to students who have taken ARCH 374) Philosophy of Structure aims to investigate structure in its broadest sense. The course is divided in two halves; the first one gives an overview of the development of theoretical structural frameworks such as mathematics and geometry, while the second one highlights physical structures constructed by nature (geology, turbulence), man or animals.

ARCH 527 CIVIC DESIGN. (3) (2-0-7) (Prerequisite: ARCH 378) The elements of form in buildings and their siting design in the urban setting.

ARCH 528 HISTORY OF HOUSING. (3) (2-0-7) (Prerequisite: ARCH 251 or permission of instructor) Indigenous housing both transient and permanent, from the standpoint of individual structure and pattern of settlements. The principal historic examples of houses including housing in the age of industrial revolution and contemporary housing.

ARCH 529 HOUSING THEORY. (3) (2-0-7) (Prerequisite: ARCH 528 or permission of instructor) A review of environmental alternatives in housing; contemporary housing and the physical and sociological determinants that shape it; Canadian housing.

ARCH 531 ARCHITECTURAL INTENTIONS VITRUVIUS - RENAISSANCE. (3) (2-0-7) (Prerequisite: ARCH 251) Architectural intentions embodied in buildings and writings of architects from antiquity to the Renaissance. Special emphasis is placed on the cultural connections of architecture to science and philosophy.

ARCH 532 ORIGINS OF MODERN ARCHITECTURE. (3) (2-0-7) (Prerequisite: ARCH 251) Examination of architectural intentions (theory and practice) in the European context (especially France, Italy and England), during the crucial period that marks the beginning of the modern era.

ARCH 540 SELECTED TOPICS IN ARCHITECTURE 1. (3) (2-0-7) A course to allow the introduction of new topics in Architecture as needs arise, by regular and visiting staff.

ARCH 541 SELECTED TOPICS IN ARCHITECTURE 2. (3) (2-0-7) A course to allow the introduction of new topics in Architecture as needs arise, by regular and visiting staff.

ARCH 550 URBAN PLANNING 1. (3) (2-0-7) (Prerequisite: B.Sc.(Arch.) or permission of instructor) (Not normally open to Urban Planning students) Theory and practice. An examination of different basic approaches to urban planning with special reference to Quebec.

ARCH 551 URBAN PLANNING 2. (3) (2-1-6) (Prerequisite: ARCH 550) Urban design and project development, theory and practice. Detailed analysis of selected examples of the development process and of current techniques in urban design. Includes case studies from Quebec and elsewhere.

ARCH 554 MECHANICAL SERVICES. (2) (2-0-4) (Prerequisite: ARCH 405 or permission of instructor) Problems encountered in providing mechanical services in buildings. Physiological and environmental aspects of heat, ventilation and air conditions, estimation

of heating and cooling loads and selection and specification of equipment. Sprinkler systems and plumbing. Construction problems produced by installation of this equipment.

ARCH 555 ENVIRONMENTAL ACOUSTICS. (2) (2-0-4) (Prerequisite: ARCH 405 or permission of instructor) Acoustics in architectural design, and in environmental control of buildings. Acoustical requirements in the design of auditoria such as theatres, lecture halls, opera houses, concert halls, churches, motion picture theatres, studios. Principles of noise and vibration control, sound insulating in building construction. Practical noise control in various types of buildings.

BMDE – Biomedical Engineering

Offered by: Department of Biomedical Engineering
Former Teaching Unit Code: 399

BMDE 501 SELECTED TOPICS IN BIOMEDICAL ENGINEERING. (3) (3-0-6) An overview of how techniques from engineering and the physical sciences are applied to the study of selected physiological systems and biological signals. Using specific biological examples, systems will be studied using: signal or finite-element analysis, system and identification, modelling and simulation, computer control of experiments and data acquisition.

BMDE 503 BIOMEDICAL INSTRUMENTATION. (3) (2-1-6) A review of the principles and practice of making biological measurements in the laboratory, including theory of linear systems, data sampling, computer interfaces, basic electronic circuit design and machining. Laboratory facilities allow students to experiment with computer-based data acquisition.

BMDE 519 BIOMEDICAL SIGNALS AND SYSTEMS. (3) (2-0-8) (Prerequisites: Satisfactory standing in U3 Honours Physiology (Neurophysiology option); or U3 Major in Physics-Physiology; or permission of instructor.) An introduction to the theoretical framework, experimental techniques and analysis procedures available for the quantitative analysis of physiological systems and signals. Lectures plus laboratory work using the Biomedical Engineering computer system. Topics include: amplitude and frequency structure of signals, filtering, sampling, correlation functions, time and frequency-domain descriptions of systems.

CHEE – Chemical Engineering

Offered by: Department of Chemical Engineering
Former Teaching Unit Code: 302

CHEE 200 INTRODUCTION TO CHEMICAL ENGINEERING. (4) (3-2-8) (Restrictions: students with DCS in PAS, HS or equivalent) Introduction to the design of industrial processes. Survey of unit operations, and systems of units. Elementary material balances, first and second laws of thermodynamics, use of property tables and charts, steady flow processes, heat engines, refrigeration cycles. Relationships between thermodynamic properties, property estimation techniques. Laboratory and design exercise.

CHEE 204 CHEMICAL MANUFACTURING PROCESSES. (3) (2-3-4) (Prerequisite: CHEE 200) Material and energy balances in chemical processes. Problem solving in the design of separation processes (evaporation, crystallization), reactor design, process control, and environmental applications.

CHEE 220 CHEMICAL ENGINEERING THERMODYNAMICS. (3) (3-1-8) (Prerequisite: CHEE 200) Application of thermodynamic equilibrium; free energy and equilibrium; phase rule; chemical reaction equilibrium for homogenous and multicomponent/multiphase systems. Application to the design of binary distillation. Laboratory exercise.

CHEE 230 ENVIRONMENTAL ASPECTS OF TECHNOLOGY. (3) (3-0-6) The impact of urbanization and technology on the environment. Topics include urbanization: causes, effects, land use regulations; transportation technology and environmental implications; environ-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

mental impact of energy conversions; energy policy alternatives; formulation of energy and environmental policy; air pollution: sources, effects, control; water pollution: sources, effects, control.

CHEE 291 INSTRUMENTAL MEASUREMENT LABORATORY. (4) (2-5-5) Elements of statistical analysis associated with instrumental measurements. Principles of operation and calibration of selected measuring instruments. Principles of modern data acquisition and processing. Introduction to instrument system selection in chemical engineering.

CHEE 314 FLUID MECHANICS. (4) (3-3-6) (Prerequisite: CHEE 204. Corequisite: MATH 265.) Fluid properties; dimensional analysis; drag; packed/fluidized beds; macroscopic energy balances, Bernoulli's equation and linear momentum theorem; flowmeters, pipeline systems, non-Newtonian fluids, microscopic balances leading to continuity and Navier-Stokes equations; boundary layer approximation; turbulence. Laboratory exercises.

CHEE 315 HEAT AND MASS TRANSFER. (4) (3-2-7) (Prerequisite: CHEE 314) Transport of heat and mass by diffusion and convection; transport of heat by radiation; diffusion; convective mass transfer; drying; absorption; mathematical formulation of problems and equipment design for heat and mass transfer; laboratory exercises.

CHEE 340 PROCESS MODELLING. (3) (3-1-5) (Prerequisites: MATH 261; MATH 265; CHEE 314) Principles of mathematical modelling in chemical engineering: problem formulation, solution, discrete systems; difference and difference-differential equations, methods of solution; understanding system behaviour, optimization.

CHEE 351 SEPARATION PROCESSES. (3) (3-0-6) (Prerequisites: CHEE 204, CHEE 220. Corequisites: CHEE 315.) Concepts underlying separation processes. Equilibrium-based processes with staging and continuous contacting, distillation, evaporation, liquid-liquid extraction, leaching. Introduction to membrane based separations.

CHEE 360 TECHNICAL PAPER 1. (1) (0-0-3) A technical paper prepared according to instructions issued by the Department.

CHEE 363 PROJECTS CHEMICAL ENGINEERING 1. (2) (1-0-5) (Prerequisite: CHEE 200 (A D grade is acceptable for prerequisite purposes only)) Projects on social or technical aspects of chemical engineering practice. Students must suggest their own projects to be approved and supervised by a member of the staff. Students may work in groups.

CHEE 370 ELEMENTS OF BIOTECHNOLOGY. (3) (3-0-6) (Prerequisite: CHEM 234) Enzyme kinetics; proteins, carbohydrates and other biochemicals; industrially significant microbes; introduction to genetic engineering, cell structure and metabolism; laboratory exercises.

CHEE 380 MATERIALS SCIENCE. (3) (3-1-5) (Prerequisite: CHEE 220) Structure/property relationship. Atomic and molecular structure, bonds, electronic band structure. Order in solids: crystal structure, disorders, solid phases. Mechanical properties and fracture, physico-chemical properties, design.

CHEE 392 PROJECT LABORATORY 1. (4) (3-3-6) (Prerequisite: CHEE 291) Planning for the solution of experimental problems; design of experiments for logical and statistical interpretation; statistical analysis of experimental data; effective work in groups; selected laboratory exercises.

CHEE 393 PROJECT LABORATORY 2. (5) (2-10-4) (Prerequisite: CHEE 392) Student groups execute and report on experimental projects.

CHEE 423 CHEMICAL REACTION ENGINEERING. (4) (3-1-8) (Prerequisites: CHEM 233; CHEE 315) Review of fundamental concepts in chemical reaction thermodynamics and kinetics. Mass and energy balances for homogenous ideal reactors. Batch, semi-batch and continuous operation. Minimization of by-product and pollution production. Heterogenous reactions, effect of heat and mass transfer on the global rate. Laboratory exercises.

CHEE 430 TECHNOLOGY IMPACT ASSESSMENT. (3) (3-1-5) (Restricted to final year students by permission of instructor) The

power of technology to shape man's physical, economic and social environment: effects of technological transitions on culture and ecology; (TIA) methodologies, public participation, engineering contributions, regulations; implications of TIA on social and economic development.

CHEE 438 ENGINEERING PRINCIPLES IN PULP AND PAPER PROCESSES. (3) (3-0-6) (Corequisite: CHEE 423) Characterization of wood, pulp and paper. Flowsheets of basic pulping processes. Applications of thermodynamics, fluid mechanics, heat and mass transfer, and reaction engineering principles in the pulp and paper processes.

CHEE 452 PARTICULATE SYSTEMS. (3) (3-0-6) (Prerequisites: CHEE 200, CHEE 314) (A D grade is acceptable for prerequisite purposes only.) Study of operations involving multiphase systems with one of the phases finely sub-divided as bubbles, drops or particles. Applications in environmental engineering, grinding, agglomeration, settling, fluidization.

CHEE 453 PROCESS DESIGN. (4) (4-1-7) (Prerequisites: CHEE 315; MIME 310. Corequisite: CHEE 351) Analysis of design alternatives. Structure of process design systems, degrees of freedom, information flow. Computer-aided process and plant design programs, physical properties, specifications, recycle convergence, optimization, applications, economics. Safety, environmental control in plant design.

CHEE 455 PROCESS CONTROL. (4) (3-1-8) (Prerequisites: CHEE 315; CHEE 351; CHEE 423) Dynamic modelling of processes, transfer functions, first and higher-order systems, dead-time, open and closed loop responses, empirical models, stability, feedback control, controller tuning, transient response, frequency response, feedforward and ratio control, introduction to computer control, sampling, discrete models, Z-transform, introduction to multivariable control. Laboratory exercises.

CHEE 456 DESIGN PROJECT 1. (1) (1-0-2) (Prerequisite: CHEE 393. Corequisite: CHEE 453. Must be taken in the semester preceding CHEE 547.) Introduction to a process design and economic evaluation project, including environmental and safety aspects, for a major industrial operation. Students work in small groups under an experienced plant design supervisor.

CHEE 457 DESIGN PROJECT 2. (5) (1-2-12) (Prerequisite: CHEE 456. Must be taken in the semester following CHEE 456.) A process plant design and economic evaluation, including environmental and safety aspects, for a major industrial operation. Students work in small groups, under an experienced plant design supervisor. Plant visit.

CHEE 458 COMPUTER APPLICATIONS. (3) (2-3-4) (Prerequisites: COMP 208 and CHEE 393) Use of computers and software as problem solving aids in chemical engineering. Lectures on software engineering, computer architectures, and multitasking. In laboratory work, groups of students will produce software to be used and maintained by others.

CHEE 462 TECHNICAL PAPER 2. (1) (0-0-3) (Prerequisite: CHEE 360) A technical paper prepared according to instructions issued by the Department.

CHEE 464 PROJECTS CHEMICAL ENGINEERING 2. (2) (1-0-5) (Prerequisite: CHEE 363) Projects on social or technical aspects of chemical engineering practice. Students must suggest their own projects to be approved and supervised by a member of the staff. Students may work in groups.

CHEE 471 INDUSTRIAL WATER POLLUTION CONTROL. (3) (3-0-6) (Prerequisite: CHEE 314 or equivalent) Effect of wastes on streams, water quality and standard analyses, waste water sampling techniques, waste water treatment technology and processes; design of treatment operations and equipment; physical, chemical and biological methods; specific industrial applications with emphasis on Canadian case studies; industrial effluent treatability studies.

CHEE 472 INDUSTRIAL AIR POLLUTION CONTROL. (3) (2-0-7) (Prerequisite: CHEE 314 or equivalent) Air quality standards, air surveys, process design considerations, dispersion theory and stack

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

design; dust cleaning methods, design of scrubbers, case studies in the Canadian context.

CHEE 474 BIOCHEMICAL ENGINEERING. (3) (3-0-6) (Prerequisites: CHEE 370, CHEE 423) Bioreactor design for biotechnology and environmental applications; microbial growth kinetics; application of transport phenomena and selected chemical engineering unit operations. Bioreactor instrumentation and performance optimization. Air and media sterilization processes. Selected operations of downstream processing and product recovery.

CHEE 481 POLYMER ENGINEERING. (3) (3-0-6) (Prerequisite: CHEM 212) The application of engineering fundamentals to the preparation and processing of polymers. Classification and characterization of polymers, reaction media and kinetics of polymerization, reactor design, mechanical behaviour of polymers, visco-elasticity and rheology, processing techniques; extrusion, molding, etc.

CHEE 484 MATERIALS ENGINEERING. (3) (3-0-6) (Prerequisites: CHEE 315, CHEE 380) Processes for forming and producing engineering materials such as amorphous, semicrystalline, textured and crystal-oriented substances, short and long fibre-reinforced polymers, ceramics and ceramic composites. Effect of processing variables on the properties of the finished article. Process of blending and alloying. Shaping, bonding and joining operations.

CHEE 487 CHEMICAL PROCESSING: ELECTRONICS INDUSTRY. (3) (3-0-6) (Prerequisite: CHEM 233) Chemical processes and unit operations in the manufacture of microelectronic components and their supports. Fabrication of silicon wafers, purification, crystal growth. Imaging processes, deposition of semiconductive materials, plasma and chemical etching. Reclamation of reagents from waste streams. Safety and environmental concerns.

CHEE 494 RESEARCH PROJECT AND SEMINAR. (3) (1-6-2) (Prerequisite: CHEE 393) Independent study and experimental work on a topic chosen by consultation between the student and Departmental Staff.

CHEE 494D1 RESEARCH PROJECT AND SEMINAR. (1.5) (Students must also register for CHEE 494D2) (No credit will be given for this course unless both CHEE 494D1 and CHEE 494D2 are successfully completed in consecutive terms) (CHEE 494D1 and CHEE 494D2 together are equivalent to CHEE 494) Independent study and experimental work on a topic chosen by consultation between the student and Departmental Staff.

CHEE 494D2 RESEARCH PROJECT AND SEMINAR. (1.5) (Prerequisite: CHEE 494D1) (No credit will be given for this course unless both CHEE 494D1 and CHEE 494D2 are successfully completed in consecutive terms) (CHEE 494D1 and CHEE 494D2 together are equivalent to CHEE 494) See CHEE 494D1 for course description.

CHEE 495 RESEARCH PROJECT AND SEMINAR. (4) (1-9-2) (Prerequisite: CHEE 393) Independent study and experimental work on a topic chosen by consultation between the student and the Departmental staff.

Also offered as:

CHEE 495D1 RESEARCH PROJECT AND SEMINAR. (2) (Students must also register for CHEE 495D2) (No credit will be given for this course unless both CHEE 495D1 and CHEE 495D2 are successfully completed in consecutive terms) (CHEE 495D1 and CHEE 495D2 together are equivalent to CHEE 495)

CHEE 495D2 RESEARCH PROJECT AND SEMINAR. (2) (Prerequisite: CHEE 495D1) (No credit will be given for this course unless both CHEE 495D1 and CHEE 495D2 are successfully completed in consecutive terms) (CHEE 495D1 and CHEE 495D2 together are equivalent to CHEE 495)

CHEE 496 ENVIRONMENTAL RESEARCH PROJECT. (3) (1-6-2) (Prerequisite: CHEE 393 or permission of instructor.) Independent study and experimental work on an environmental topic chosen by consultation between the student and Departmental staff.

Also offered as:

CHEE 496D1 ENVIRONMENTAL RESEARCH PROJECT. (1.5) (Students must also register for CHEE 496D2) (No credit will be given for this course unless both CHEE 496D1 and CHEE 496D2 are

successfully completed in consecutive terms) (CHEE 496D1 and CHEE 496D2 together are equivalent to CHEE 496)

CHEE 496D2 ENVIRONMENTAL RESEARCH PROJECT. (1.5) (Prerequisite: CHEE 496D1) (No credit will be given for this course unless both CHEE 496D1 and CHEE 496D2 are successfully completed in consecutive terms) (CHEE 496D1 and CHEE 496D2 together are equivalent to CHEE 496)

CHEE 571 SMALL COMPUTER APPLICATIONS: CHEMICAL ENGINEERING. (3) (2-0-7) (Prerequisite: CHEE 458 or permission of the instructor.) The use of small computers employing a high level language for data acquisition and the control of chemical processes. Real-time system characteristics and requirements, analog to digital, digital to analog conversions and computer control loops are examined. Block level simulation.

● **CHEE 581 POLYMER COMPOSITES ENGINEERING.** (3) (3-0-6) (Prerequisite: CHEE 481 or permission of instructor)

CHEE 591 ENVIRONMENTAL BIOREMEDIATION. (3) (3-0-6) The presence and role of microorganisms in the environment, the role of microbes in environmental remediation either through natural or human-mediated processes, the application of microbes in pollution control and the monitoring of environmental pollutants.

CIVE – Civil Engineering

Offered by: Department of Civil Engineering
Former Teaching Unit Code: 303

CIVE 202 CONSTRUCTION MATERIALS. (4) (4-2-6) (Prerequisite: CIVE 290) Classification of materials; atomic bonds; phase diagrams; elementary crystallography, imperfections and their relationship to mechanical behaviour; engineering properties and uses of ferrous and non-ferrous metals, ceramics, cement, concrete, timber and timber products, polymers, composites; smart materials and systems; electrochemical reactions and corrosion, prevention and protection; environmental influences; group laboratory projects.

CIVE 203 SOLID MECHANICS LABORATORY. (1)

CIVE 205 STATICS. (3) (3-2-4) Systems of forces and couples, resultants, equilibrium. Trusses, frames and beams, reactions, shear forces, bending moments. Centroids, centres of gravity, distributed forces, moments of inertia. Friction, limiting equilibrium, screws, belts.

CIVE 206 DYNAMICS. (3) (3-2-4) (Prerequisite: CIVE 205. Corequisites: MATH 260 and MATH 261) Kinematics and kinetics of particles, systems, and rigid bodies; mass-acceleration, work-energy, impulse-momentum. Moving coordinate systems. Lagrange's equations. Vibrations and waves.

CIVE 207 SOLID MECHANICS. (4) (3-2-7) (Prerequisites: CIVE 205 (a D grade is acceptable for prerequisite purposes), MECH 290 (under special circumstances, the Department may permit this course to be taken as a corequisite) or equivalent) (Four laboratory sessions and weekly tutorials) Stress-strain relationships; elastic and inelastic behaviour; performance criteria. Elementary and compound stress states, Mohr's circle. Shear strains, torsion. Bending and shear stresses in flexural members. Deflections of beams. Statically indeterminate systems under flexural and axial loads. Columns. Dynamic loading.

CIVE 208 CIVIL ENGINEERING SYSTEMS ANALYSIS. (3) (3-1-5) (Prerequisites: COMP 208 and Corequisite: MATH 265) Introduction to civil engineering systems; system modelling process; systems approach and optimization techniques; application of linear programming; simplex method; duality theory; sensitivity analysis; transportation problem; assignment problem; network analysis including critical path method; integer linear programming method.

CIVE 210 SURVEYING. (2) (Summer (02-JUL-2003/31-JUL-2003)) (Prerequisite: COMP 208) The construction and use of modern survey instruments; transit, level, etc.; linear and angular measurements and errors; horizontal and vertical curves; error analysis,

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

significance of figures; use of computers and software; recent developments.

CIVE 225 ENVIRONMENTAL ENGINEERING. (4) (4-2-6) (Prerequisite: CIVE 290. Corequisite: MATH 261) Introduction to environmental chemistry; mass balance analyses in engineered and natural systems; water, soil and air pollution characterization and control; water quality parameters; drinking water and wastewater treatment technologies; global climate change: possible causes and effects; risk assessment for pollutant exposure; solid- and hazardous-waste management.

CIVE 281 ANALYTICAL MECHANICS. (3) (3-1-5) (Corequisites: MATH 260 and MATH 261) Kinematics of particles, dynamics of particles. Work, conservative forces, potential energy. Relative motion and general moving frames of reference. Central force fields and orbits. Dynamics of a system of particles. General motion of rigid bodies, angular momentum and kinetic energy of rigid bodies. Generalized coordinates and forces, Lagrange's equations.

CIVE 283 STRENGTH OF MATERIALS. (4) (4-1-7) (Prerequisite: CIVE 205 (a D grade is acceptable for prerequisite purposes)) Structural behaviour, trusses, statically determinate beams, frames, and arches; moments of inertia, stress, strain, properties of materials; bending and shearing stresses; torsion; fixed and continuous beams; reinforced concrete beams; columns; combined stresses; Mohr's circle.

CIVE 290 THERMODYNAMICS AND HEAT TRANSFER. (3) (3-2-4) Macroscopic vs. microscopic viewpoint; states and processes; energy conservation and transformation. Phase equilibrium; equations of state; thermodynamic properties; work; heat; First Law of thermodynamics; internal energy; enthalpy; specific heat; thermodynamic processes: reversibility, polytropic processes, applications of First Law; Second Law; entropy; introduction to heat transfer.

CIVE 302 PROBABILISTIC SYSTEMS. (3) (3-1-5) (Prerequisites: MATH 260 and COMP 208 (a D grade is acceptable for prerequisite purposes)) An introduction to probability and statistics with applications to Civil Engineering design. Descriptive statistics, common probability models, statistical estimation, regression and correlation, acceptance sampling.

CIVE 311 GEOTECHNICAL MECHANICS. (4) (3-3-6) (Prerequisite: CIVE 207) Identification and classification of soils; physical and engineering properties; principle of effective stress; permeability, compressibility, shear strength, stress-strain characteristics; groundwater flow and seepage; earth pressure and retaining structures; stress distributions in soils; settlement; bearing capacity of shallow foundations.

CIVE 317 STRUCTURAL ENGINEERING 1. (3) (3-1-5) (Prerequisites: CIVE 202 and CIVE 207) The design process; loads, sources, classifications, load factors, combinations; limit states design; structural systems and foundations; choice of materials; virtual work and energy methods; static and kinematic indeterminacy; slope deflection method, introduction to matrix methods; analysis of indeterminate systems; force envelopes.

CIVE 318 STRUCTURAL ENGINEERING 2. (3) (3-1-5) (Prerequisite: CIVE 317) Durability and service life; fire resistance and protection; steel, reinforced concrete and timber; behaviour and design of components in tension, compression, bending and shear; slenderness, global and local instability; axial load and moment interaction; curvature, deflection, ductility; connections; bond and anchorage of reinforcement; simple footings.

CIVE 319 TRANSPORTATION ENGINEERING. (3) (3-1-5) (Prerequisites: CIVE 208 and COMP 208. Corequisite: CIVE 302) Introduction to design and operating principles and procedures for surface transportation systems, including vehicle motion and performance, pavements, geometric design of roadbeds, vehicle flow and capacity, traffic control, demand, supply and cost concepts.

CIVE 320 NUMERICAL METHODS. (4) (3-3-6) (Prerequisites: COMP 208 and MATH 265) Numerical procedures applicable to civil engineering problems: integration, differentiation, solution of initial-value problems, solving linear and non-linear systems of equations,

boundary-value problems for ordinary-differential equations, and for partial-differential equations.

CIVE 323 HYDROLOGY AND WATER RESOURCES. (3) (3-2-4) (Prerequisite: CIVE 302) Precipitation, evaporation and transpiration. Streamflow, storage reservoirs. Groundwater hydrology. Morphology of river basins. Statistical analysis in hydrology, stochastic modelling and simulation. Case studies in hydroelectric power development, flood damage mitigation, irrigation and drainage.

CIVE 324 CONSTRUCTION PROJECT MANAGEMENT. (3) (3-1-5) (Prerequisites: MIME 310 and CIVE 208) Construction fundamentals; procedures and responsibilities; tender documents, specifications, proposals, contracts; construction project organization, estimating, planning, scheduling, control; liability, claims procedures, arbitration; job safety; security and loss control; case histories, site visits.

CIVE 326 FLUIDS & HYDRAULICS LABORATORY. (1) (Not open to students who have taken or have taken CIVE 327.) (Prerequisite: Course equivalent to CIVE 327 without laboratory component.) Laboratory experiments in fluid mechanics and hydraulics.

CIVE 327 FLUID MECHANICS AND HYDRAULICS. (4) (3-6-3) (Prerequisites: CIVE 206 and MATH 265) Fluid properties; hydrostatics; dimensional analysis and similitude, fluxes of mass, momentum and energy; Bernoulli's equation; method of control volume; streamline curvature; potential flow and boundary layers; pipe flow, hydraulic machinery and introduction to open-channel flow.

● **CIVE 382 PARTIAL DIFFERENTIAL EQUATIONS IN ENGINEERING.** (3) (3-1-5) (Prerequisites: MATH 261, MATH 265 and CIVE 281 (a D grade is acceptable for prerequisite purposes))

CIVE 385 STRUCTURAL STEEL AND TIMBER DESIGN. (3) (3-1-5) (Prerequisite: CIVE 283. Corequisite: ARCH 240) Structural loadings, load factors, code requirements and design procedures. Characteristics of structural steel and structural timber in building construction. Structural design of axially loaded tension and compression members, joists, beams, girders, trusses and framing systems.

CIVE 388 FOUNDATION AND CONCRETE DESIGN. (3) (3-1-5) (Prerequisite: CIVE 283) Physical properties of concrete; behaviour and design of reinforced concrete members in compression, tension, bending, shear and combined loadings; bond and anchorage; soil properties, soil testing, footings; pile foundation; shorting; retaining walls.

CIVE 416 GEOTECHNICAL ENGINEERING. (3) (3-1.5-4.5) (Prerequisite: CIVE 311) Site investigation, in-situ measurement of engineering properties of soils; braced excavations; bearing capacity of shallow foundations; upper bound solutions; soil structure interaction; design aspects of footing and rafts, coefficient of subgrade reaction; deep foundations; bearing capacity of piles, pile settlement; stability of slopes; infinite slopes; frost action in soils.

CIVE 418 DESIGN PROJECT. (3) (1-2-6) (Prerequisite: Completion of an approved set of required and complementary courses; normally restricted to final semester.) Capstone design project.

CIVE 421 MUNICIPAL SYSTEMS. (3) (3-2-4) (Prerequisite: CIVE 327) Design of water-related municipal services; sources of water and intake design; estimation of water demand and wastewater production rates; design, construction and maintenance of water distribution, wastewater and stormwater collection systems; pumps and pumping stations; pipe materials, network analysis and optimization; storage; treatment objectives for water and wastewater.

CIVE 428 WATER RESOURCES AND HYDRAULIC ENGINEERING. (3) (3-3-3) (Prerequisite: CIVE 327) Application of continuity, energy and momentum concepts to open-channel flow; design of channels considering uniform flow and flow resistance, non-uniform flow and longitudinal profiles; design of channel controls and transitions; unsteady flow and flood routing; river ice engineering.

CIVE 430 WATER TREATMENT AND POLLUTION CONTROL. (3) (3-3-3) (Prerequisites: CIVE 225 and CIVE 327) Principles of water and sewage treatment. Water and sewage characteristics; design of conventional unit operations and processes; laboratory analyses of potable and waste waters.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

CIVE 432 TECHNICAL PAPER. (1) (0-0-3) (Prerequisite: EDEC 206) A technical paper, on a suitable topic, is to be prepared in accordance with detailed instructions which are provided by the Department. This paper will normally be written in the U3 year and may be submitted in September or January.

CIVE 433 URBAN PLANNING. (3) (3-1-5) (Prerequisites: CIVE 421 and MIME 310. Corequisite: CIVE 319) The City in History. The planning profession, evolution of planning in North America, Canada and Quebec. Planning theories, the general or master plan, planning processes and techniques, planning and design of residential subdivisions. Local planning issues, housing policies, planning laws.

CIVE 440 TRAFFIC ENGINEERING. (3) (3-1-5) (Prerequisite: CIVE 319 (a D grade is acceptable for prerequisite purposes)) Driver, vehicle and traffic flow characteristics; origin-destination studies, traffic studies and analysis, accident studies, queuing theory applications, gap acceptance, simulation, highway capacity, traffic regulations and control measures, intersection control.

CIVE 446 CONSTRUCTION ENGINEERING. (3) (3-1-5) (Prerequisite: CIVE 324) Project management principles; construction equipment economics, selection, operation; characteristics of building, heavy, marine, underground and route construction projects; international projects.

CIVE 451 GEOENVIRONMENTAL ENGINEERING. (3) (3-1.5-4.5) (Prerequisites: CIVE 225 and CIVE 311) Geoenvironmental hazards; land management of waste; regulatory overview, waste characterization; soil-waste interaction; geosynthetics; low permeability clay barriers; contaminant transport; containment systems; collection and removal systems; design aspects; strategies for remediation; rehabilitation technologies.

CIVE 460 MATRIX STRUCTURAL ANALYSIS. (3) (3-2-4) (Prerequisites: CIVE 206 and CIVE 317) Computer structural analysis, direct stiffness applied to two and three dimensional frames and trusses, matrix force method, nonlinear problems, buckling of trusses and frames, introduction to finite element analysis.

CIVE 462 DESIGN OF STEEL STRUCTURES. (3) (3-3-3) (Prerequisite: CIVE 318) Design of structural steel elements: plate girders, members under combined loadings, eccentrically loaded connections, structural systems. Design of structural steel systems: composite floor systems, braced frames, moment resisting frames.

CIVE 463 DESIGN OF CONCRETE STRUCTURES. (3) (3-3-3) (Prerequisite: CIVE 318) Review of flexural behaviour and design concepts. Design of flexural members, columns, two-way slab systems, retaining walls, disturbed regions, and shear walls. Introduction to prestressed concrete design.

CIVE 470 RESEARCH PROJECT. (3) (0-1-8) (Prerequisite: 60 credits in the Civil Engineering and Applied Mechanics program) Open to students with a high CGPA. A research project must be carried out and a technical paper prepared under the supervision of a member of staff. The project must be established with the consent of the Staff Supervisor, and must be approved by the Department before registration. May be taken in conjunction with the required course CIVE 418 and the project therefore can be carried out through two semesters.

CIVE 492 STRUCTURES. (2) (2-2-2) (Prerequisites: CIVE 385 and CIVE 388) A study of structural systems in concrete, steel, timber; a philosophy of structure; choice of structure; economic factors in design; recent developments and trends in structure; lateral stability by frame action, bracing shear walls; mechanics of certain structural forms.

CIVE 512 ADVANCED CIVIL ENGINEERING MATERIALS. (3) (3-3-3) (Prerequisite: CIVE 202) Production, structure and properties of engineering materials; ferrous alloys, treatments, welding, special steels, cast iron; ceramic materials; polymers; composite materials; concrete, admixtures, structure, creep, shrinkage; asphalt and asphaltic materials; clay materials and bricks; impact of environment on material response, durability, quality assessment and control, industrial specifications; recent advances.

CIVE 514 STRUCTURAL MECHANICS. (3) (3-1-5) Stress, strain, and basic equations of linear elasticity. General and particular solutions of plane and axisymmetric problems. Stress concentration and failure criteria. Unsymmetrical bending of beams; shear centres; torsion of thin-walled structural members. Curved beams. Formulation and applications of energy principles, and their connection to finite-element method.

● **CIVE 526 SOLID WASTE MANAGEMENT.** (3) (3-2-4) (Prerequisite: CIVE 225)

CIVE 527 RENOVATION AND PRESERVATION: INFRASTRUCTURE. (3) (3-2-4) (Prerequisites: CIVE 202 and CIVE 318) Maintenance, rehabilitation, renovation and preservation of infrastructure; infrastructure degradation mechanisms; mechanical, chemical and biological degradation; corrosion of steel; condition surveys and evaluation of buildings and bridges; repair and preservation materials, techniques and strategies; codes and guidelines; case studies.

CIVE 540 URBAN TRANSPORTATION PLANNING. (3) (3-1-5) (Prerequisite: CIVE 319 or permission of instructor.) Process and techniques of urban transportation engineering and planning, including demand analysis framework, data collection procedures, travel demand modelling and forecasting, and cost-effectiveness framework for evaluation of project and system alternatives.

● **CIVE 541 RAIL ENGINEERING.** (3) (3-1-5)

CIVE 550 WATER RESOURCES MANAGEMENT. (3) (3-0-6) (Prerequisite: CIVE 323 or equivalent) State-of-the-art water resources management techniques; case studies of their application to Canadian situations; identification of major issues and problem areas; inter-provincial and international river basins; implications of development alternatives; institutional arrangements for planning and development of water resources; and, legal and economic aspects.

CIVE 553 STREAM POLLUTION AND CONTROL. (3) (3-2-4) (Prerequisite: CIVE 225) Water quality standards. Physical and chemical pollution, and bacterial contamination of surface waters. Effects of specific types of pollution such as thermal, point and non-point sources. Stream self purification. Effects on lake eutrophication. Pollution surveys and methods of control.

CIVE 555 ENVIRONMENTAL DATA ANALYSIS. (3) (3-0-6) (Prerequisite: CIVE 302 or permission of instructor.) Application of statistical principles to design of measurement systems and sampling programs. Introduction to experimental design. Graphical data analysis. Description of uncertainty. Hypothesis tests. Model parameter estimation methods: linear and nonlinear regression methods. Trend analysis. Statistical analysis of censored data. Statistics of extremes.

CIVE 572 COMPUTATIONAL HYDRAULICS. (3) (3-0-6) (Prerequisite: CIVE 327 or equivalent) Computation of unsteady flows in open channels; abrupt waves, flood waves, tidal propagations; method of characteristics; mathematical modelling of river and coastal currents.

CIVE 573 HYDRAULIC STRUCTURES. (3) (3-0-6) (Prerequisites: CIVE 323 and CIVE 327) Hydraulic aspects of the theory and design of hydraulic structures. Storage dams, spillways, outlet works, diversion works, drop structures, stone structures, conveyance and control structures, flow measurement and culverts.

● **CIVE 574 FLUID MECHANICS OF WATER POLLUTION.** (3) (Prerequisite: CIVE 327 or equivalent.)

CIVE 577 RIVER ENGINEERING. (3) (3-0-6) (Prerequisite: CIVE 428 or permission of the instructor.) Fluvial geomorphology; sediment properties; river turbulence; mechanics of the entrainment, transportation and deposition of solids by fluids; threshold of movement; bed forms; suspended load, bed load and total load equations; stable channel design and regime rivers; river modeling; river engineering and river management.

● **CIVE 585 GROUNDWATER HYDROLOGY.** (3) (3-0-6) (Prerequisite: Permission of instructor)

● **CIVE 587 PAVEMENT DESIGN.** (3) (3-0-6) (Prerequisite: Permission of instructor)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ECSE – Electrical Engineering

Offered by: Department of Electrical and Computer Engineering
Former Teaching Unit Code: 304

ECSE 200 FUNDAMENTALS OF ELECTRICAL ENGINEERING. (3) (3-0-6) (Corequisites: MATH 261 or MATH 325) An introduction to part of the broad scope of electrical engineering: electrostatics, capacitance, conduction, magnetic fields, inductance, circuits and components, sine waves in time and space, electrical machines and transformers, signal amplification.

ECSE 210 CIRCUIT ANALYSIS. (3) (3-1-5) (Prerequisite: ECSE 200) (For Fall Term: Section A01: Limited to Electrical Honours and Computer Engineering students only.) (For Winter Term: Section A01: Limited to Regular Electrical Engineering students only.) Circuit models, KCL and KVL, branch relations, resistive circuit analysis, network theorems, one- and two-port networks, networks in sinusoidal steady-state, power considerations, transient analysis of first- and second-order networks, response to exponential driving functions, frequency response of networks.

ECSE 221 INTRODUCTION TO COMPUTER ENGINEERING. (3) (3-1-5) (Prerequisite: COMP 202) Data representation in digital computers. Boolean algebra. Basic combinational circuits; their analysis and synthesis. Elements of sequential circuits: latches, flip-flops, counters and memory circuits. Computer structure, central processing unit, machine language. Assemblers and assembler language.

ECSE 291 ELECTRICAL MEASUREMENTS LABORATORY. (2) (1-4-1) (Corequisite: ECSE 210) Experiments with fundamental electric circuits are used to illustrate the principles and limitations of basic electrical and electronic instrumentation in typical measurement applications. Basic electrical laboratory practice and safety procedures are introduced. Introduction to error analysis and application to laboratory measurements.

ECSE 303 SIGNALS AND SYSTEMS 1. (3) (3-0-6) (Prerequisites: ECSE 210, MATH 270 or MATH 247. Corequisite: MATH 381 or MATH 249.) Elementary continuous and discrete-time signals, impulse functions, basic properties of discrete and continuous linear time-invariant (LTI) systems, Fourier representation of continuous-time periodic and aperiodic signals, the Laplace transform, time and frequency analysis of continuous-time LTI systems, application of transform techniques to electric circuit analysis.

ECSE 304 SIGNALS AND SYSTEMS 2. (3) (3-0-6) (Prerequisite: ECSE 303) Application of transforms to the analysis of LTI single-loop feedback systems, the discrete-time Fourier series, the discrete-time Fourier transform, the Z transform, time and frequency analysis of discrete-time LTI systems, sampling systems, application of continuous and discrete-time signal theory to communications LTI systems.

ECSE 305 PROBABILITY AND RANDOM SIG. 1. (3) (3-0-6) (Prerequisite: ECSE 303) The basic probability model, the heuristics of model-building and the additivity of probability; classical models; conditional probability and Bayes rule; random variables and vectors, distribution and density functions, expectation; statistical independence, laws of large numbers, central limit theorem; introduction to random processes and random signal analysis.

ECSE 321 INTRODUCTION TO SOFTWARE ENGINEERING. (3) (3-1-5) (Prerequisites: COMP 202 or COMP 208) Design, development and testing of software systems. Software life cycle: requirements analysis, software architecture and design, implementation, integration, test planning, and maintenance. The course involves a group project.

ECSE 322 COMPUTER ENGINEERING. (3) (3-0-6) (Prerequisites: ECSE 200 or MECH 383, and ECSE 221) (Not open to students who have taken ECSE 222) Data structures (arrays, lists, stacks, queues, dequeues and trees) and their machine representation and simple algorithms. Peripheral devices: printers, keyboards, magnetic type drives, magnetic disc drives. Peripheral interfacing

and busses. Introduction to operating systems. System integration. Computer systems and networks.

ECSE 323 DIGITAL SYSTEM DESIGN. (5) (3-6-6) (Prerequisites: ECSE 291, ECSE 221, and EDEC 206) Minimization and synthesis of combinational logic and finite state machines. Synthesis of synchronous and asynchronous sequential circuits. Principles of control design. Basic concepts in design for testability. The laboratory experiments involve the design and testing of digital systems using small and medium scale integrated circuits. CAD software is used in the design process.

ECSE 330 INTRODUCTION TO ELECTRONICS. (3) (3-0-6) (Prerequisite: ECSE 210) Operational amplifier circuits; conduction in semiconductors, PN junction diodes, diode circuit applications; JFET, MOSFET and BIPOLAR transistors, terminal characteristics, small and large signal models; simple amplifier configurations, three-terminal properties of small-signal models; SPICE electronic circuit simulation.

ECSE 334 INTRODUCTION TO MICROELECTRONICS. (5) (3-6-6) (Prerequisite: ECSE 291, ECSE 303, ECSE 330 and EDEC 206) Differential and multistage amplifiers, power amplifiers, feedback amplifiers, active filters, tuned amplifiers, oscillators; MOS and BIPOLAR digital circuits including gates, latches and multivibrators; A/D and D/A conversion techniques.

ECSE 351 ELECTROMAGNETIC FIELDS. (3) (3-1-5) (Prerequisites: ECSE 200 and MATH 265) Maxwell's equations, electrostatics, magnetostatics and induction for power-frequency electrical engineering problems.

ECSE 352 EM WAVES AND OPTICS. (3) (3-1-5) (Prerequisite: ECSE 351) Transient and steady state wave propagation in transmission lines. Telephone and radio frequency lines. Smith's chart and impedance matching. Maxwell's equations, Helmholtz's equations, Poynting's theorem. Plane waves, polarization, Snell's law, critical and Brewster's angle. Rectangular waveguides, optical fibres, dispersion. Radiation and antennas.

ECSE 353 ELECTROMAGNETIC FIELDS AND WAVES. (3) (3-1-5) (Prerequisites: ECSE 210 and MATH 265) Maxwell's equations. Waves in free space and on transmission lines. Electric and magnetic force and energy. Magnetic materials. Faraday's law. Applications to engineering problems.

ECSE 361 POWER ENGINEERING. (3) (3-0-6) (Prerequisite: ECSE 210, ECSE 351) Characteristics and components of power systems. Generation, transmission and utilization of electric power. 3-phase ac and dc systems. Fundamentals of electromechanical energy conversion. Ampere and Faraday's law. Magnetic circuits. Systems of coupled coils. Torque and force. Rotating magnetic fields. Basic rotating machines.

ECSE 404 CONTROL SYSTEMS. (3) (3-0-6) (Prerequisite: ECSE 303) Modelling of engineering systems. State variables. State and transfer function descriptions. Observability and controllability. Stability, Realizations. Performance limitations. Open-loop, feedforward, closed-loop configurations. Performance specifications. The Nyquist criterion; stability margins, unstructured uncertainty and robust stability. Classical design. Systems with delay. Pole placement, linear quadratic design. Observers, controllers based on separation.

ECSE 411 COMMUNICATIONS SYSTEMS 1. (3) (3-0-6) (Prerequisite: ECSE 304 and ECSE 305) Communication system models; AM and FM modulation, performance of AM and FM systems in noise; sampling, PCM and DPCM techniques; FDM and TDM multiplexing systems; baseband digital transmission over bandlimited channels, digital modulation and detection techniques; illustrative examples of subscriber loop telephone systems, cable TV systems and broadcasting systems.

ECSE 412 DISCRETE TIME SIGNAL PROCESSING. (3) (3-0-6) (Prerequisite: ECSE 304) Discrete-time signals and systems; Fourier and Z-transform analysis techniques, the discrete Fourier transform; elements of FIR and IIR filter design, filter structures; FFT techniques for high speed convolution; quantization effects.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ECSE 413 COMMUNICATIONS SYSTEMS 2. (3) (3-0-6) (Prerequisite: ECSE 411) Introduction to radio communications; satellite communication systems; the cellular concept; fading channel models, digital modulation techniques over fading channels, diversity systems, spread spectrum techniques; fixed assignment multiple access (FDMA, TDMA, CDMA), duplexing methods (FDD, TDD); illustrative examples of terrestrial mobile systems, fixed wireless systems, LEOs, etc.; overview of standardization activities.

ECSE 414 INTRODUCTION TO TELECOMMUNICATION NETWORKS. (3) (3-0-6) (Prerequisites: ECSE 304, ECSE 305 and ECSE 322) Introduction to the physical and software architecture of modern networks; transport configurations, multiplexing, the digital hierarchy; wired and wireless access systems; circuit and packet switching systems, signaling, addressing and routing; protocol stacks; local area networking; introduction to network engineering; examples include: ATM, ISDN, IP, Frame Relay, Ethernet.

ECSE 423 FUNDAMENTALS OF PHOTONICS. (3) (3-1-5) (Prerequisites: ECSE 352, Corequisite: ECSE 305) Introduction to the fundamentals of modern optics and photonics. Geometrical optics, wave optics, Gaussian beam optics and resonators, polarization, Fourier optics. Attenuation and dispersion. Optical waveguides. Classical description of optical amplifiers, introduction to lasers.

ECSE 424 HUMAN-COMPUTER INTERACTION. (3) (3-4-2) (Prerequisite: ECSE 322) The course highlights human-computer interaction strategies from an engineering perspective. Topics include user interfaces, novel paradigms in human-computer interaction, affordances, ecological interface design, ubiquitous computing and computer-supported cooperative work. Attention will be paid to issues of safety, usability, and performance.

ECSE 425 COMPUTER ORGANIZATION AND ARCHITECTURE. (3) (3-0-6) (Prerequisites: ECSE 322 and ECSE 323) Trends in technology. CISC vs. RISC architectures. Pipelining. Instruction level parallelism. Data and Control Hazards. Static prediction. Exceptions. Dependencies. Loop level parallelism. Dynamic scheduling, branch prediction. Branch target buffers. Superscalar and N-issue machines. VLIW. ILP techniques. Cache analysis and design. Interleaved and virtual memory. TLB translations and caches.

☐ **ECSE 426 MICROPROCESSOR SYSTEMS.** (3) (1-3-5) (Prerequisites: ECSE 323 and EDEC 206) (This course may be counted as a technical complementary or a lab complementary.) (Limited Enrolment (50)) Introduction to current microprocessors, their architecture, programming, interfacing and operating systems. The course includes lectures, use of crossassemblers, and simulators as well as laboratory experiments on actual microprocessor hardware.

ECSE 427 OPERATING SYSTEMS. (3) (3-3-3) (Prerequisite: ECSE 322 or COMP 273) Operating system services, file system organization, disk and cpu scheduling, virtual memory management, concurrent processing and distributed systems, protection and security. Aspects of the DOS and UNIX operating systems and the C programming language. Programs that communicate between workstations across a network.

ECSE 428 SOFTWARE ENGINEERING PRACTICE. (3) (3-4-2) (Prerequisite: ECSE 321 or COMP 335) Software engineering practice in industry, related to the design and commissioning of large software systems. Ethical, social, economic, safety and legal issues. Metrics, project management, costing, marketing, control, standards, CASE tools and bugs. The course involves a large team project.

ECSE 430 PHOTONIC DEVICES AND SYSTEMS. (3) (3-1-5) (Prerequisite: ECSE 423) Introduction to photonic devices and applications. Semiconductor lasers, optical amplifiers, optical modulators, photodetectors and optical receivers, optical fibers and waveguides, fiber and waveguide devices, systems applications.

☐ **ECSE 431 INTRODUCTION TO VLSI CAD.** (3) (3-4-2) (Prerequisites: ECSE 323 and ECSE 330) (Limited enrolment - 30. Departmental permission required.) The computer-aided design of digital VLSI circuits. Hardware description languages, automatic synthesis, design for testability, technology mapping, simulation, timing analysis, generation of test vectors and fault coverage analysis.

ECSE 432 PHYSICAL BASIS: TRANSISTOR DEVICES. (3) (3-0-6) (Prerequisites: ECSE 330, ECSE 351 and PHYS 271) Quantitative analysis of diodes and transistors. Semiconductor fundamentals, equilibrium and non-equilibrium carrier transport, and Fermi levels. PN junction diodes, the ideal diode, and diode switching. Bipolar Junction Transistors (BJT), physics of the ideal BJT, the Ebers-Moll model. Field effect transistors, metal-oxide semiconductor structures, static and dynamic behaviour, small-signal models.

ECSE 435 MIXED-SIGNAL TEST TECHNIQUES. (3) (3-0-6) (Prerequisites: ECSE 304, and ECSE 334) Purpose and economics of mixed-signal test, DC measurements. Accuracy and repeatability. DSP-based theory and its applications to parametric testing of analog filters, DACs, and ADC. Timing and PLL measurements. Design for Testability.

ECSE 451 EM TRANSMISSION AND RADIATION. (3) (3-0-6) (Prerequisite: ECSE 352) Microwave transmission through waveguides: impedance matching, microwave devices, filters and resonators; microwave transmission through free space; near and far field behaviour of electromagnetic radiators, simple antennas, antenna arrays, practical antenna parameters; the physics of the radio communication channel: reflection, diffraction and scattering and their macroscopic impact (multipath, fading).

ECSE 460 APPAREILLAGE ÉLECTRIQUE (ELECTRICAL POWER EQUIPMENT). (3) (3-2-4) (Prerequisite: ECSE 361.) (Taught in French.) Éléments d'un réseau de transport. Lignes: modélisation et paramètres. Transformateurs: circuits équivalents, pertes, enclenchement, protection. Disjoncteurs: fonctionnement et dimensionnement. Équipements de compensation: condensateurs, branchement série et shunt, inductances. Coordination d'isolement.

ECSE 461 ELECTRIC MACHINERY. (3) (3-0-6) (Prerequisite: MECH 383) (Not open to students in Electrical Engineering) Electric and magnetic circuits. Notions of electromechanical energy conversion applied to electrical machines. Basic electrical machines - transformers, direct-current motors, synchronous motors and generators, three phase and single phase induction machines. Elements of modern electronically controlled electric drive systems.

ECSE 462 ELECTROMECHANICAL ENERGY CONVERSION. (3) (3-0-6) (Prerequisite: ECSE 361) Lumped parameter concepts of electromechanics. Energy, co-energy in the derivation of torques and forces. Examples of electric machines: - dc, synchronous and induction types. Steady-state, transient and stability analysis. Power electronic controllers.

ECSE 464 POWER SYSTEMS ANALYSIS 1. (3) (3-0-6) (Prerequisite: ECSE 361) Basic principles of planning and operating interconnected power systems with emphasis on Canadian conditions. Mathematical models for system. Steady-state analysis of power systems, load flow formulation and solution algorithms. Operating strategies, economic dispatch, voltage reactive power regulation, frequency and tie-line power control.

ECSE 465 POWER ELECTRONIC SYSTEMS. (3) (3-2-4) (Prerequisites: ECSE 334, ECSE 361.) Introduction to power electronics: definition, applications and classification of converters. Review of analytical techniques. Overview of power semiconductor switches. Line communicated rectifiers and inverters. Switch mode power converters and modulation techniques. Choppers, inverters and rectifiers. Resonant mode converters. Application to power systems and energy conversion.

ECSE 468 ÉLECTRICITÉ INDUSTRIELLE (INDUSTRIAL POWER SYSTEMS). (3) (3-2-4) (Prerequisite: ECSE 361.) (Taught in French.) Structure des réseaux électriques industriels. Niveau de tension. Installations électriques, codes et normes. Court-circuits, protection et coordination. Mise à la terre. Qualité de l'onde. Facteur de puissance, tarification et gestion de l'énergie électrique.

● **ECSE 472 SYSTEMS DESIGN.** (3) (2-2-5) (Prerequisite: At least 42 credits of Departmental courses and permission of the instructor)

● **ECSE 483 MULTIDISCIPLINARY PROJECT 1.** (3) (0-3-6) (Prerequisites: EDEC 206 and at least 42 Departmental credits from Elec-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

trical and Computer Eng. and Computer Science) (Restriction: Open only to later year students who can find a professor within the Department prepared to supervise a 2-semester, multidisciplinary project.)

● **ECSE 484 MULTIDISCIPLINARY PROJECT 2.** (3) (0-3-6) (Prerequisite: ECSE 483)

□ **ECSE 485 IC FABRICATION LABORATORY.** (2) (1-3-2) (Prerequisite: ECSE 334, EDEC 206. Corequisite: ECSE 432 or ECSE 533) (Limited Enrolment - 12) Essential processes for silicon semiconductor device fabrication: etching, diffusion, photolithography. Fabrication of large area PN junctions, selective area PN junctions and MOSFETs. Design and fabrication of simple MOS circuits. Electrical characterization of devices and circuits.

□ **ECSE 486 POWER LABORATORY.** (2) (1-3-2) (Prerequisites: EDEC 206, ECSE 361 and ECSE 334) (Limited Enrolment - 14) Techniques of electric power, efficiency, torque, speed measurements. Starting, running and control of electric machines: dc, synchronous, induction types. Power electronic controllers. Each group of students has access to a compact experiment bench containing a set of micro-machines and all the necessary equipment.

□ **ECSE 487 COMPUTER ARCHITECTURE LABORATORY.** (2) (0-3-3) (Prerequisite: EDEC 206. Corequisite: ECSE 425 or ECSE 525) (Limited enrollment -50) Basic software tools used in the design, synthesis and analysis of computer and communication systems such as data-paths, switching circuits, and arithmetic and logic circuits. Behavioral and structural modeling of hardware designs in the IEEE standard hardware description language VHDL. Synthesis and implementation of hardware designs using Programmable Logic Devices.

□ **ECSE 488 HIGH FREQUENCY LABORATORY.** (2) (1-3-2) (Prerequisites: ECSE 291 and EDEC 206. Corequisite: ECSE 451.) (Limited Enrolment - 20) High frequency measurement techniques. Vector network analyzer and spectrum analyzer. Resistors, capacitors and inductors at high frequencies. High-level signal handling of a high-frequency bandpass amplifier. Electromagnetic interference (EMI) and spectrum coordination. Cavity resonators. Standing waves in waveguides. Reciprocity of microwave networks. Scattering parameters of a microstrip network.

ECSE 489 TELECOMMUNICATION NETWORK LABORATORY. (2) (Prerequisite: EDEC 206) (Corequisite: ECSE 414) Experiments involving the configuration and operation of telecommunication network technologies, and the modelling of telecommunication networks. Configuration of transport facility (SONET), bandwidth management with permanent virtual connections (ATM), implementation of a routing plan in a packet switched network (IP), configuration of end-to-end service (telephony over IP).

□ **ECSE 490 DIGITAL SIGNAL PROCESSING LABORATORY.** (2) (0-3-3) (Prerequisites: ECSE 291 and EDEC 206. Corequisite: ECSE 412 or ECSE 512) (Limited Enrolment - 30) (Departmental approval required) Experiments involving the digital processing of signals using computer-aided design tools for design, processing and visualization and real-time processing using DSP chips. Filter structures and design, multi-rate signal processing, filter banks, fast transforms, adaptive filtering, signal coding and quantization.

□ **ECSE 491 COMMUNICATION SYSTEMS LABORATORY.** (2) (0-3-3) (Prerequisites: ECSE 291 and EDEC 206. Corequisite: ECSE 411 or ECSE 511) (Limited Enrolment - 30) Experimental studies and simulation of analog and digital transmission techniques. Performance of AM and FM systems. FSK and PSK modulation techniques and spectra. Sampling of analog signals, PCM and TDM techniques.

ECSE 492 OPTICAL COMMUNICATIONS LABORATORY. (2) (Prerequisite: ECSE 423 or ECSE 527, and EDEC 206) (Limited Enrolment - 20) Hands-on experience of the physical layer of optical communications systems. Experiments involving optical fiber link characterization, laser measurements, beam divergence, coupling efficiency. Use of lasers, optical spectrum analyser, data generator, beam profiler, photodetectors, optical filters. Experiments are supported with simulation and analysis software.

□ **ECSE 493 CONTROL AND ROBOTICS LABORATORY.** (2) (0-3-3) (Prerequisites: ECSE 291 and EDEC 206. Corequisite: ECSE 404 or ECSE 502) (Limited Enrolment - 16) Experimental studies for the design of control systems, with particular emphasis on motion control as applicable to robotics. Fundamentals of sensors and actuators. Linear compensator specification and design in the time and the frequency domain. Pole placement. Effect of model uncertainty on performance.

□ **ECSE 494 ELECTRICAL ENGINEERING DESIGN PROJECT.** (3) (0-5-4) (Prerequisites: EDEC 206 and at least 42 Departmental credits) (Limited Enrolment - 50) A laboratory design project undertaken with close supervision by a staff member. The project consists of defining an engineering problem and seeking the solution through experimental investigation. Results are reported in a seminar at the end of term and in a technical paper.

ECSE 496 TELECOMMUNICATIONS SYSTEMS AND SERVICES. (3) (3-3-3) (Prerequisites: ECSE 411 and ECSE 414) Case studies of several end-to-end telecommunication systems used for the delivery of various service application scenarios. Issues in network and systems architecture, technology, operations management, regulation and competition. Examples from conventional telephony, internet service delivery, wireless services and cable TV distribution.

ECSE 498 HONOURS THESIS 1. (3) (0-3-6) (Prerequisite: EDEC 206 and at least 42 Departmental credits) A research project undertaken with close supervision by a staff member. The work consists of defining an engineering problem, reviewing the associated literature, and seeking the solution through experimental investigation. A literature review and a written thesis proposal are required along with a seminar presentation at end of term.

ECSE 499 HONOURS THESIS 2. (3) (0-3-6) (Prerequisite: ECSE 498) A research project undertaken with close supervision by a staff member. A continuation of ECSE 498. The work consists of carrying out the research plan developed in ECSE 498 along with a seminar presentation at end of term.

ECSE 501 LINEAR SYSTEMS. (3) (3-0-6) (Prerequisite: ECSE 304) State equations and input-output descriptions of linear systems: basic properties and solution. Observability and controllability. Matrix Fraction Descriptions. Canonical forms. Feedback synthesis: linear quadratic control problems, pole placement, observers and compensators.

ECSE 502 CONTROL ENGINEERING. (3) (3-0-6) (Prerequisites: ECSE 303, ECSE 305) Modeling of engineering systems, simulation. Linear systems theory. Performance limitations. Stability of single-input-single-output closed-loop systems. Classical design in the frequency domain. Sampled-data implementation of continuous-time design.

● **ECSE 504 COMPUTER CONTROL.** (3) (3-0-6) (Prerequisites: ECSE 404 or ECSE 502 and ECSE 305)

ECSE 505 NONLINEAR CONTROL SYSTEMS. (3) (3-0-6) (Prerequisite: ECSE 501) Basic ODE formulation of non-linear systems; structural properties; Lyapunov and LaSalle stability theory and nonlinear and multivariable controller design; input-output stability; small gain theorem, conservation, passivity; system linearization, zero and inverse dynamics and regulator design; discontinuous and sliding mode control; applications to deterministic adaptive control.

ECSE 507 OPTIMIZATION AND OPTIMAL CONTROL. (3) (3-0-6) (Prerequisites: MATH 265 or MATH 248 and MATH 270 or MATH 247) General Introduction to optimization methods including steepest descent, conjugate gradient, Newton algorithms. Generalized matrix inverses and the least squared error problem. Introduction to constrained optimality; convexity and duality; interior point methods. Introduction to dynamic optimization; existence theory, relaxed controls, the Pontryagin Maximum Principle. Sufficiency of the Maximum Principle.

ECSE 509 PROBABILITY AND RANDOM SIG. 2. (3) (3-0-6) (Prerequisites: ECSE 304 and ECSE 305) Multivariate Gaussian distributions; finite-dimensional mean-square estimation (multivariate case); principal components; introduction to random processes;

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

weak stationarity: correlation functions, spectra, linear processing and estimation; Poisson processes and Markov chains: state processes, invariant distributions; stochastic simulation.

ECSE 510 RANDOM PROCESSES. (3) (3-0-6) (Prerequisite: ECSE 509) Finite-dimensional distribution functions. Estimation, Orthogonal Projection Theorem. Linear stochastic systems; Kalman filtering. Stationary stochastic processes: spectral Representation Theorem, Wiener filtering, Wold decomposition; ARMA processes. Brownian Motion; Ito integral and stochastic differential equations; forward and backward equations for diffusions. Ergodic theorems. Stochastic dynamic programming. Applications to communication and control systems.

ECSE 511 INTRODUCTION TO DIGITAL COMMUNICATION. (3) (3-0-6) (Prerequisite: ECSE 304. Corequisite: ECSE 509) (An advanced version of ECSE 411) Amplitude and angle modulation including AM, FM, FDM and television systems; introduction to random processes; sampling and quantization, PCM systems, TDM; digital modulation techniques, Maximum-Likelihood receivers, synchronization issues; elements of information theory including information sources, source coding and channel capacity.

ECSE 512 DIGITAL SIGNAL PROCESSING 1. (3) (3-0-6) (Prerequisite: ECSE 304 and ECSE 305) Review of discrete-time transforms, sampling and quantization, frequency analysis. Structures for IIR and FIR filters, coefficient quantization, roundoff noise. The DFT, its properties, frequency analysis and filtering using DFT methods, the FFT and its implementation. Multirate processing, subsampling and interpolation, oversampling techniques.

ECSE 521 DIGITAL COMMUNICATIONS 1. (3) (3-0-6) (Prerequisite: ECSE 411 or ECSE 511. Corequisite: ECSE 509) Modulation: orthogonal and biorthogonal signalling, MPSK, QAM, modulation with memory. Detection: coherent, noncoherent and differentially coherent detection, performance issues and channel capacity, synchronization. Coding: block and convolutional codes, fast Hadamard Transform decoding, Viterbi algorithm, turbo-codes. Bandlimited channels: intersymbol interference, spectral shaping, correlative coding, data estimation and channel equalization.

ECSE 522 ASYNCHRONOUS CIRCUITS AND SYSTEMS. (3) (3-3-3) (Prerequisite: ECSE 323) Specification of asynchronous behaviors. Asynchronous logic components. Hierarchical design and verification. Concurrency issues: deadlock, livelock, starvation, safety. Timing issues. Modern design styles: handshaking, micropipelines. Asynchronous analysis models for protocols and software.

ECSE 523 SPEECH COMMUNICATIONS. (3) (3-0-6) (Prerequisite: ECSE 412 or ECSE 512) Articulatory and acoustic descriptions of speech production, speech production models, speech perception, digital processing of speech signals, vocoders using formant, linear predictive and cepstral techniques, overview of automatic speech recognition systems, speech synthesis systems and speaker verification systems.

● **ECSE 525 COMPUTER ARCHITECTURE.** (3) (3-0-6) (Prerequisites: ECSE 322 and ECSE 323)

ECSE 526 ARTIFICIAL INTELLIGENCE. (3) (3-0-6) (Prerequisite: ECSE 322) Design principles of autonomous agents, agent architectures, machine learning, neural networks, genetic algorithms, and multi-agent collaboration. The course includes a term project that consists of designing and implementing software agents that collaborate and compete in a simulated environment.

ECSE 527 OPTICAL ENGINEERING. (3) (3-0-6) (Prerequisite: ECSE 304 and ECSE 352) A structure introduction to modern optical engineering. Topics covered include the propagation of light through space, refraction, diffraction, polarization, lens systems, ray-tracing, aberrations, computer-aided design and optimization techniques, Gaussian beam analysis, micro-optics and computer generated diffractive optical elements. Systems and applications will be stressed throughout.

ECSE 528 TELECOMMUNICATION NETWORK ARCHITECTURE. (3) (3-0-6) (Prerequisite: ECSE 411 or ECSE 511. Corequisite: ECSE 509) Organization of large, highspeed, multiservice telecommunication networks. Connection hierarchies, protocol stacks, transmis-

sion formats. Local-area networking: Token Ring and Ethernet. Multiplexing for wide-area transport: performance modelling and analysis, traffic scheduling and shaping. Routing and flow control. Switch architecture: performance criteria, buffer management, routers versus switches and hybrids.

ECSE 529 IMAGE PROCESSING AND COMMUNICATION. (3) (3-0-6) (Prerequisite: ECSE 304) Introduction to vision in man and machine; computer vision systems; biological vision systems; biological signal processing; edge detection; spatial- and frequency-domain processing; color. Low-level visual processing in computer vision, psychophysics, and neurobiology, and their similarities and differences.

● **ECSE 530 LOGIC SYNTHESIS.** (3) (3-2-4) (Prerequisite: ECSE 323)

ECSE 531 REAL TIME SYSTEMS. (3) (3-3-3) (Prerequisites: ECSE 322 and ECSE 323) Real-time engineering applications of computers to on-line control, communication systems and data acquisition. Aspects of hardware, software, interfacing, operating systems, and their integration into a complete system are addressed.

ECSE 532 COMPUTER GRAPHICS. (3) (3-3-3) (Prerequisite: ECSE 322) Introduction to computer graphics systems and display devices: raster scan, scan conversion, graphical input and interactive techniques - window environments; display files: graphics languages and data structures: 2D transformations; 3D computer graphics, hidden line removal and shading; graphics system design; applications. Laboratory project involving the preparation and running of graphics programs.

ECSE 533 PHYSICAL BASIS OF SEMICONDUCTOR DEVICES. (3) (3-0-6) (Prerequisites: ECSE 330, ECSE 351 and PHYS 271) Quantitative analysis of diodes and transistors. Semiconductor fundamentals, equilibrium and non-equilibrium carrier transport, and Fermi levels. PN junction diodes, the ideal diode, and diode switching. Bipolar Junction Transistors (BJT), physics of the ideal BJT, the Ebers-Moll model. Field effect transistors, metal-oxide semiconductor structures, static and dynamic behaviour, small-signal models.

ECSE 534 ANALOG MICROELECTRONICS. (3) (3-0-6) (Prerequisite: ECSE 334) Design of analog ICs using specialized analog CAD tools such as SPICE. Voltage and current amplifier design which encompasses the study of biasing circuits, current sources and mirrors, input and output stages, and frequency compensation; precision reference sources; analog multipliers; oscillators; waveform generators and shaping circuits, and analog switches.

ECSE 536 RF MICROELECTRONICS. (3) (3-3-3) (Prerequisite: ECSE 334.) Introduction to Radio Frequency Integrated Circuits and wireless transceiver architectures. Modeling of passive/active integrated devices. Design of monolithic bipolar and CMOS LNAs, mixers, filters, broadband amplifiers, RF power amplifiers, VCOs, and frequency synthesizers. Analysis of noise and non-linearity in RFICs. Project using modern RFIC simulation/layout CAD tools.

ECSE 543 NUMERICAL METHODS IN ELECTRICAL ENGINEERING. (3) (3-0-6) (Prerequisites: ECSE 322, ECSE 334 and ECSE 352) DC resistor networks and sparse matrix methods. Nonlinear electric and magnetic circuits: curve-fitting; the Newton-Raphson method. Finite elements for electrostatics. Transient analysis of circuits: systems of Ordinary differential equations; stiff equations. Transient analysis of induced currents. Solution of algebraic eigenvalue problems. Scattering of electromagnetic waves: the boundary element method; numerical integration.

ECSE 545 MICROELECTRONICS TECHNOLOGY. (3) (3-0-6) (Prerequisite: ECSE 432 or ECSE 533) Basic techniques in the fabrication of microelectronic circuits. Four-point probe, alloyed contacts, diffusion processes, ion implantation epitaxy, silicon dioxide, photolithography, selected diffusion and metallization, transistor fabrication, dry etching, monolithic integrated circuits, isolation, mask making, thin and thick film components, MOS gate voltage and integrated circuits.

ECSE 547 FINITE ELEMENTS IN ELECTRICAL ENGINEERING. (3) (3-0-6) (Prerequisites: ECSE 322 and ECSE 352) Finite elements for

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

electrostatics. Energy minimization. Semi-conductors. Nonlinear magnetics and Newton-Raphson. Axisymmetric problems. Capacitance, inductance, and resistance through finite elements. Resonance: cavities, waveguides. High order and curvilinear elements.

☐ **ECSE 548 INTRODUCTION TO VLSI SYSTEMS.** (3) (2-2-5) (Prerequisites: ECSE 334 and ECSE 323) (Limited Enrolment - 20) (Password card required) An interdisciplinary course for electrical engineering and computer science students. A structured design methodology for managing the complexity of VLSI system design. Sufficient information on integrated devices, circuits, digital subsystems and system architecture is presented to enable students to span the range of abstractions from device physics to VLSI digital systems.

● **ECSE 549 EXPERT SYSTEMS IN ELECTRICAL DESIGN.** (3) (3-0-6) (Prerequisites: ECSE 323 and ECSE 361) Design processes in electrical engineering. Hierarchical design. Computer aided design. Expert system technology. Device representations, heuristics and structures, algebraic models. Design versus diagnosis, "Shallow" and "Deep" systems, second generation (multi-paradigm) systems. Shells and their uses in design systems. Knowledge acquisition systems.

● **ECSE 559 FLEXIBLE AC TRANSMISSION SYSTEMS.** (3) (3-0-6) (Prerequisite: ECSE 361 and ECSE 334)

● **ECSE 563 POWER SYSTEMS OPERATION AND PLANNING.** (3) (3-0-6) (Prerequisite: ECSE 361) Design and operation of large scale power systems: Temporal, spatial and hierarchical decomposition of tasks. Local vs. distributed control. Load-frequency control. Voltage and speed regulation. Interconnected power systems. Power flow. Security states. Optimal operation of power systems. Power system reliability.

● **ECSE 565 INTRODUCTION TO POWER ELECTRONICS.** (3) (3-0-6) (Prerequisite: ECSE 334) Semiconductor power switches - thyristors, GTO's, bipolar transistors, MOSFET's. Switch mode power amplifiers. Buck and boost principles. Modulation methods -PWM, delta, hysteresis current control. Rectifiers, inverters, choppers.

● **ECSE 571 OPTOELECTRONIC DEVICES.** (3) (3-0-6) (Prerequisites: ECSE 304, ECSE 305, ECSE 352.) (Corequisite: ECSE 533) Physical basis of optoelectronic devices including Light Emitting Diodes, semiconductor optical amplifiers, semiconductor lasers, quantum well devices, and solid state lasers. Quantitative description of detectors, optical modulation, optical logic devices, optical interconnects, and optomechanical hardware. Throughout the course, photonic systems applications will be addressed.

● **ECSE 573 MICROWAVE ELECTRONICS.** (3) (3-0-6) (Prerequisite: ECSE 432 or ECSE 533) Physical basis of modern microwave devices and circuits. Microwave transistors and tunnel diodes, transferred electron devices, transit time devices and infra red devices. Microwave generation and amplification, microwave FET circuits. Noise and power amplification.

● **ECSE 578 CRYSTALS AND CONDUCTION.** (3) (3-0-6) (Prerequisite: ECSE 432 or ECSE 533)

● **ECSE 596 OPTICAL WAVEGUIDES.** (3) (3-0-6) (Prerequisite: ECSE 352) Introduction to wave and ray optics, ray equation. Kirchhoff-Huygens diffraction theory, Fourier optics, Gaussian beams, propagation characteristics of optical fibers and dielectric waveguides for wideband optical fiber communication systems, waveguide group velocity and dispersion, thin-film waveguides. Discussion of optical fiber communication systems and guided-wave photonic devices.

FACC – Faculty Course

Offered by: Engineering - Dean's Office
Former Teaching Unit Code: 300

● **FACC 200 INDUSTRIAL PRACTICUM.** (0) The purpose of this course is to expose engineering students to engineering practice in industry. It consists of a minimum of three months of full-time remunerated work in industry, typically done during the summer. The course is administered by the McGill Engineering Career Centre.

● **FACC 220 LAW FOR ARCHITECTS AND ENGINEERS.** (3) (3-0-6) Aspects of the law which affect architects and engineers. Definition and branches of law; Federal and Provincial jurisdiction, civil and criminal law and civil and common law; relevance of statutes; partnerships and companies; agreements; types of property, rights of ownership; successions and wills; expropriation; responsibility for negligence; servitudes/easements, privileges/liens, hypothecs/mortgages; statutes of limitations; strict liability of architect, engineer and builder; patents, trade marks, industrial design and copyright; bankruptcy; labour law; general and expert evidence; court procedure and arbitration.

● **FACC 480 TECHNOLOGICAL ENTREPRENEURSHIP PROJECT.** (3) (0-4-5) (Prerequisite: at least 6 credits from the Minor in Technological Entrepreneurship) (Open to Minor in MTE students only) Students will work with an existing "knowledge-based" or technology-based company and will define, plan and complete an in-depth study of a particular aspect of technological entrepreneurship that interests them. This project will be under the supervision of the instructor of the course and an employee of the company concerned.

MECH – Mechanical Engineering

Offered by: Department of Mechanical Engineering
Former Teaching Unit Code: 305

● **MECH 201 INTRODUCTION TO MECHANICAL ENGINEERING.** (2) (3-0-3) The practice of Mechanical Engineering: its scope and context. The role of Design. Introduction to the Design process. The role of engineering analysis and socio-economic factors in Design. Introduction to the individual mechanical engineering subjects and their role in Design. Case studies.

● **MECH 210 MECHANICS 1.** (2) (2-1-3) Static equilibrium of particles and rigid bodies. Beams, trusses, frames and machines. Concept of work and energy. Static equilibrium and stability.

● **MECH 220 MECHANICS 2.** (4) (4-1-7) (Prerequisites: MECH 210 and MATH 260. Pre-/Co-requisite: MATH 261) Kinematics of particles and rigid bodies. Particle dynamics: force-momentum and work-energy approaches. Kinematics and kinetics of rigid bodies.

● **MECH 240 THERMODYNAMICS 1.** (3) (3-1-5) Thermodynamic systems and properties. First law of thermodynamics: energy, work and heat. State principle, p-v-T surfaces, phase equilibrium, ideal gas model. Second law of thermodynamics, entropy, exergy analysis. Energy analysis applied to steady and transient engineering systems including heat engines, refrigerators and heat pumps, air compressors.

☐ **MECH 260 MACHINE TOOL LABORATORY.** (2) (1-3-2) Basic machine tool operations, numerical control of machine tools, and metrology. The use of hand tools, and sheet metal work. Introduction to rapid prototyping and nontraditional machining methods. Extensive laboratory hands-on exercises.

● **MECH 261 MEASUREMENT LABORATORY.** (2) (2-3-1) (Restricted to Civil Engineering students) Basic experimental laboratory measurements, such as measurement of strain, pressure, force, position, and temperature.

● **MECH 262 STATISTICS AND MEASUREMENT LABORATORY.** (3) (3-3-3) Introduction to probability: conditional probability, binomial and Poisson distributions, random variables, laws of large numbers. Statistical analysis associated with measurements; regression and

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

correlation. Basic experimental laboratory techniques, including the measurement of strain, pressure, force, position, and temperature.

MECH 290 GRAPHICS 2. (3) (3-3-0) (This course is intended for Civil Engineering students) Traditional descriptive geometry of points, lines and planes, done with modern tools. Constructed solutions with vector diagram projection; comparison with equivalent vector algebraic methods. Graphical statics, concurrent force problems including pure axial force plane structures. Structural drafting pertaining to steel, concrete and timber construction, standards and conventions. Drafting room and computer lab exercises are assigned.

MECH 291 GRAPHICS. (3) (3-3-3) Descriptive geometry of points, lines and planes, intersection and developments, auxiliary view and direct methods. Drawing standards. Working drawings and conventions, fits and tolerances, representation of welding, surface finish, threaded fasteners, standard mechanical components: motors, cylinders, bearings, gears and other elements. Sections and pictorials. Bills of material and cataloging. Computer lab exercises are assigned.

MECH 292 DESIGN 1. (3) (1-3-5) (Prerequisites: MECH 260 and MECH 291. Pre-/Co-requisites: CIVE 207, EDEC 206) Introduction to design. Problem formulation; idea generation; feasibility study; preliminary design; design; analysis, design evaluation, project management, and optimal design.

MECH 309 NUMERICAL METHODS IN MECHANICAL ENGINEERING. (3) (3-1-5) (Prerequisites: MATH 261, MATH 266, COMP 208.) Numerical techniques for problems commonly encountered in Mechanical Engineering are presented. Chebyshev interpolation, quadrature, roots of equations in one or more variables, matrices, curve fitting, splines and ordinary differential equations. The emphasis is on the analysis and understanding of the problem rather than the details of the actual numerical program.

MECH 314 DYNAMICS OF MECHANISMS. (3) (3-1-5) (Prerequisite: MECH 210) First principles of analysis; motion; position; displacement; velocity; acceleration; force; inertia and its effects. Kinematic and dynamic analysis of rigid bodies in pure rotation and in pin-connected systems; dynamic balance. Rigid bodies in rolling contact; planetary gear-trains. Bodies in sliding contact; lower and higher sliding pairs.

MECH 315 MECHANICS 3. (4) (4-1-7) (Prerequisites: MECH 220, CIVE 207 and MATH 266) Single-degree-of-freedom systems; free vibrations; effect of damping; response to harmonic, periodic and arbitrary excitation. Lagrange's equations of motion. Vibrations of multi-degree-of-freedom systems. Continuous systems.

MECH 321 MECHANICS OF DEFORMABLE SOLIDS. (3) (3-1-5) (Prerequisite: CIVE 207) Modern phenomenological theories of the behaviour of engineering materials. Stress and strain concepts and introduction to constitutive theory. Applications of theory of elasticity and thermoelasticity. Introduction to finite element stress analysis methods.

MECH 331 FLUID MECHANICS 1. (3) (3-1-5) (Prerequisite: MECH 210. Pre-/Co-requisites: MECH 220, MECH 240 and MATH 266) Physical properties of fluids. Kinematics and dynamics of fluid flow: stress in a continuum, rates of strain, rotation. Control volume analysis; conservation of mass, linear momentum and energy; Euler and Bernoulli equations; Flow measurement. Dimensional analysis and dynamical similarity. Laminar and turbulent flow in pipes and boundary layers.

MECH 341 THERMODYNAMICS 2. (3) (3-1-5) (Prerequisite: MECH 240) Generalized thermodynamics relations. Real gas effects, gas tables, dense gas equations of state and generalized compressibility, enthalpy, and entropy charts. Vapour and gas power cycles (coal/nuclear power plants). Refrigerators and heat pumps. Psychrometry and air conditioning processes. Thermodynamics of reactive gas mixtures.

MECH 346 HEAT TRANSFER. (3) (3-1-5) (Prerequisites: MECH 240 or ABEN 301, MECH 331 or ABEN 305, MATH 266 or ABEN 319) Basic concepts and overview. Steady and unsteady heat conduction. Fin Theory. Convective heat transfer: governing equations;

dimensionless parameters; analogy between momentum and heat transfer. Design correlations for forced, natural, and mixed convection. Heat exchangers. Radiative heat transfer: black- and gray-body radiation; shape factors; enclosure theory. Thermal engineering design project.

MECH 362 MECHANICAL LABORATORY 1. (2) (0-3-3) (Prerequisite: MECH 261 or MECH 262 or ABEN 216) Experiments will be performed in four areas: MECH 240 Thermodynamics, MECH 315 Vibrations, MECH 331 Fluid Mechanics 1, and MECH 346 Heat Transfer. Students should sign up to do experiments in one or more areas the term following the completion of one or more of the above courses. Students will not formally register for this course until the term in which they will complete all of the experiments.

MECH 383 APPLIED ELECTRONICS AND INSTRUMENTATION. (3) (3-2-4) (Prerequisites: MECH 261 or MECH 262, and MATH 261) Discrete and integrated components, both analogue and digital. Characteristics of passive elements. Semiconductors, amplifiers, filters, oscillators, modulators, power supplies and nonlinear devices. Introduction to digital electronics. Transducer/signal conditioner interfacing considerations.

MECH 393 DESIGN 2. (3) (3-3-3) (Prerequisite: MECH 292. Pre-/co-requisites: MECH 314 and MIME 260) (Prerequisite change awaiting University approval) The design of machine elements for strength requirements in consideration of various methods of manufacture. Synthesis of mechanical systems to fulfill performance requirements, following the engineering design process. Failure theory and fatigue life determination. Students form groups to work on a design project.

MECH 403D1 THESIS (HONOURS). (3) (0-6-12) (Prerequisite: Candidates must have completed courses in the Mechanical Engineering Program weighted at a minimum of 60 credits.) (Students must also register for MECH 403D2) (No credit will be given for this course unless both MECH 403D1 and MECH 403D2 are successfully completed in consecutive terms) This course, together with course MECH 404 involves a research project containing an explicit component of design, encompassing interrelated aspects of engineering theory and requiring a theoretical and/or experimental investigation. Students will work under the supervision of one or more staff members; completed work will be submitted in the form of a thesis.

MECH 403D2 THESIS (HONOURS). (3) (Prerequisite: MECH 403D1) (No credit will be given for this course unless both MECH 403D1 and MECH 403D2 are successfully completed in consecutive terms) See MECH 403D1 for course description.

May also be available as: MECH 403N1 and MECH 403N2

MECH 404 HONOURS THESIS 2. (3) (0-3-3) (Corequisite: MECH 403) This course is part of the same thesis project as course MECH 403.

MECH 412 DYNAMICS OF SYSTEMS. (3) (3-1-5) (Prerequisites: MECH 309, MECH 315. Pre-/Co-requisite: MECH 331) Modelling of physical systems by lumped-parameter linear elements. Unified treatment of mechanical, fluid, electrical, and thermal devices and systems. State space, formulation of state equations, time response. Frequency-response methods. Dynamic response specifications. Stability. Elementary feedback control systems. Extensive use of engineering examples and software tools.

MECH 413 CONTROL SYSTEMS. (3) (3-1-5) (Prerequisite: MECH 412) Stability of Linear Systems. Controller design based on root-locus and frequency response methods. Tuning of PID controllers. State-space representation of dynamic systems. Concepts of controllability and observability. Design of state feedback controller and state observer based on state-space and polynomial methods. Introduction to digital control.

MECH 419 ADVANCED MECHANICS OF SYSTEMS. (3) (3-1-5) (Prerequisites: MECH 220, CIVE 207, MATH 265 and MATH 266) Lagrangian and Hamiltonian dynamics. Variational methods. Discrete linear systems; classical and numerical solutions for conservative and non-conservative systems; matrix methods. Electrical-mechanical-acoustical analogies. Stability considera-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

tions and closed-loop systems. Vibration of distributed parameter systems. Energy methods. Nonlinear vibrations; the phase plane, perturbation and other methods of solution.

MECH 430 FLUID MECHANICS 2. (3) (3-1-5) (Prerequisite: MECH 331) Review of thermodynamics of gases, one dimensional isentropic flow and choking. Nozzles and wind tunnels. Normal shock waves. Flow in constant area ducts with friction and heat exchange. Compressible irrotational flow. Oblique shock waves and Prandtl-Meyer expansion. Supersonic aerofoil and wing theory.

MECH 432 AIRCRAFT STRUCTURES. (3) (3-0-6) (Prerequisites: MECH 331 and MECH 321) Plane stress and strain. Theories of failure. Plastic and viscoelastic stress-strain relations. External and internal forces in spars. Bending, deflection of beams, plastic deformation and aeroelastic distortion of wings and fuselage. Structural characteristics of wings. Torsion of wings and related critical aeroelastic design parameters; divergence and aeroelastic twist. Energy methods. Buckling in aeronautical structures. Flutter.

MECH 434 TURBOMACHINERY. (3) (3-0-6) (Prerequisite: MECH 331) A broad general treatment of energy transfer between a fluid and a rotor, velocity vector diagrams, and non-dimensional characteristics. Applications to hydraulic pumps and turbines. Two dimensional cascade theory leading to study of axial gas compressors and turbine stages. Three dimensional free and forced vortex configurations. Centrifugal compressors and radial inflow turbines.

MECH 447 COMBUSTION. (3) (3-0-6) (Prerequisite: MECH 240) Equilibrium analysis of reacting systems, Hugoniot analysis, flame propagation mechanisms, introduction to chemical kinetics, models for laminar flame propagation, ignition, quenching, flammability limits, turbulent flames, flame instability mechanisms, detonations, solid and liquid combustion.

MECH 452 MATHEMATICAL METHODS IN ENGINEERING 1. (3) (3-1-5) (Prerequisite: Candidates must have completed courses in the Mechanical Engineering Program weighted at 60 credits (minimum)) The underlying theory and application of mathematical methods in fluid dynamics, vibration, stress and strain analysis, heat transfer, etc. The eigenvalue problem, methods in analysis.

MECH 463D1 MECHANICAL ENGINEERING PROJECT. (3) (1-3-5) (Prerequisite: MECH 393) (Students must also register for MECH 463D2) (No credit will be given for this course unless both MECH 463D1 and MECH 463D2 are successfully completed in consecutive terms) Team project work typically involving the design, fabrication, verification, and application of a mechanical device/system, or experimental facility. The project work is complemented with lectures in the Fall term on topics related to design and management of design projects. Emphasis is on the completion of a project of professional quality.

MECH 463D2 MECHANICAL ENGINEERING PROJECT. (3) (Prerequisite: MECH 463D1) (No credit will be given for this course unless both MECH 463D1 and MECH 463D2 are successfully completed in consecutive terms) See MECH 463D1 for course description.

● **MECH 471 INDUSTRIAL ENGINEERING.** (3) (3-1-5)

MECH 474 SELECTED TOPICS IN OPERATIONS RESEARCH. (3) (3-0-6) (Prerequisites: MATH 266 and COMP 208) Introduction to the general mathematical programming problem in the context of engineering design; linear programming, queuing theory, Monte Carlo simulation. The above techniques will be used to study the optimization of engineering systems.

MECH 494 HONOURS DESIGN PROJECT. (3) (0-6-3) (Prerequisite: MECH 292) (Restricted to Mechanical Engineering Honours students.) An advanced design project course with emphasis on analytical solutions, performance prediction and validation, and planning for production.

MECH 495 DESIGN 3. (3) (0-6-3) (Prerequisite: MECH 463) A design project course of two terms together with MECH 496. Project approval required. Allows the completion of a project of greater complexity than MECH 393 and MECH 463 with emphasis on analytical solutions, stressing, planning for production. No lectures. Weekly consultations. Interim and final reports required.

MECH 496 DESIGN 4. (3) (0-6-3) (Prerequisite: MECH 495) Continuation of MECH 495. The two together constitute a design project course of two terms. The two courses permit the completion of a project of greater complexity than MECH 393 and MECH 463 with emphasis on analytical solutions, stressing, planning for production. No lectures. Weekly consultations. Interim and final reports required.

MECH 497 VALUE ENGINEERING. (3) (0-8-1) (Prerequisites: MECH 393 and completion of 45 credits) Value Engineering is an in-depth analysis of an industrial product or process with a view to improving its design and/or performance to increase its worth. This is a workshop type of course. Projects will be supplied by industrial firms and students will work in teams with industrial personnel.

MECH 500 SELECTED TOPICS IN MECHANICAL ENGINEERING. (3) (3-0-6) A course to allow the introduction of new topics in Mechanical Engineering as needs arise, by regular and visiting staff.

MECH 501 SPECIAL TOPICS: MECHANICAL ENGINEERING. (3) (3-0-6) A course to allow the introduction of new topics in Mechanical Engineering as needs arise, by regular and visiting staff.

MECH 522 PRODUCTION SYSTEMS. (3) (3-0-6) Characteristics of production systems. System boundaries, input-output, feedback time-lag effects, dynamics of production systems. Design for manufacturability. Process planning, process/machine tool selection, break-even analysis, CAPP. Production planning, scheduling and control of operations; quality management. Competitive strategies; FMS, CIM. Hands-on experience with production modelling and industrial simulation software.

□ **MECH 524 COMPUTER INTEGRATED MANUFACTURING.** (3) (3-0-6) (Prerequisite: Permission of the instructor) A study of the present impact of computers and automation on manufacturing. Computer-aided systems. Information modelling. Information system structures. Study of several types of production systems. Integration issues: inter- and intra-enterprise. Laboratory experience with manufacturing software systems.

● □ **MECH 526 MANUFACTURING AND THE ENVIRONMENT.** (3) (3-0-6) (Prerequisite: Permission of the instructor)

□ **MECH 528 PRODUCT DESIGN.** (3) (3-0-6) (Prerequisite: Permission of the instructor) A study of the design issues present in product life cycle demands. Computer-aided systems. Rapid prototyping. Design for manufacturability. Integration of mechanics, electronics and software in products. Effect on design of product cost, maintainability, recycling, marketability.

● □ **MECH 529 DISCRETE MANUFACTURING SYSTEMS.** (3) (3-0-6) (Prerequisite: Permission of the instructor)

MECH 530 MECHANICS OF COMPOSITE MATERIALS. (3) (3-0-6) (Corerequisite: MECH 321 or equivalent/instructor's permission) Fiber-reinforced composites. Stress, strain, and strength of composite laminates and honeycomb structures. Failure modes and failure criteria. Environmental effects. Manufacturing processes. Design of composite structures. Computer modelling of composites. Computer techniques are utilized throughout the course.

● **MECH 531 AEROELASTICITY.** (3) (3-1-5) (Prerequisites: MECH 419, MECH 319 or MECH 315 and MECH 533)

MECH 532 AIRCRAFT PERFORMANCE, STABILITY AND CONTROL. (3) (3-1-5) (Prerequisites: MECH 412, MECH 533) Aircraft performance criteria such as range, endurance, rate of climb, maximum ceiling for steady and accelerated flight. Landing and take-off distances. Static and dynamic stability in the longitudinal (stick-fixed and stick-free) and coupled lateral and directional modes. Control response for all three modes.

MECH 533 SUBSONIC AERODYNAMICS. (3) (3-1-5) (Prerequisite: MECH 331) Kinematics: equations of motion; vorticity and circulation, conformal mapping and flow round simple bodies. Two-dimensional flow round aerofoils. Three-dimensional flows; high and low aspect-ratio wings; airscrews. Wind tunnel interference. Similarity rules for subsonic irrotational flows.

MECH 534 AIR POLLUTION ENGINEERING. (3) (3-0-6) (Prerequisites: MECH 240, MECH 331, MECH 341 and MECH 447 or con-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

sent of instructor.) Pollutants from power production and their effects on the environment. Mechanisms of pollutant formation in combustion. Photochemical pollutants and smog, atmospheric dispersion. Pollutant generation from internal combustion engines and stationary power plants. Methods of pollution control (exhaust gas treatment, absorption, filtration, scrubbers, etc.).

MECH 537 HIGH-SPEED AERODYNAMICS. (3) (3-0-6) (Pre-/Co-requisite: MECH 533) Equations of compressible flows. Planar and conical shock waves. Expansion and shock wave interference; shock tubes. Method of characteristics. Supersonic nozzle design. Aerofoil theory in high subsonic, supersonic and hypersonic flows. Conical flows. Yawed, delta and polygonal wings; rolling and pitching rotations. Wing-body systems. Elements of transonic flows.

MECH 538 UNSTEADY AERODYNAMICS. (3) (3-0-6) (Prerequisite: MECH 533) Fundamental equations of unsteady compressible flows in fixed or moving reference frames. Unsteady flows past bodies in translation and having oscillatory motions. Oscillations of cylindrical pipes or shells subjected to internal flows. Vortex theory of oscillating aerofoils in incompressible flows. Theodorsen's method. Unsteady compressible flow past oscillating aerofoils.

MECH 539 COMPUTATIONAL AERODYNAMICS. (3) (3-0-6) (Prerequisite: MECH 309 or permission of the instructor.) Fundamental equations. Basic flow singularities. Boundary element methods. Source, doublet and vortex panel methods for 2D and 3D incompressible and compressible flows. Method of characteristics. Euler equations for inviscid rotational flows. Finite-difference and finite-volume methods. Explicit and implicit time-integration methods. Quasi 1D solutions. Nozzle and confined aerofoil applications.

MECH 540 DESIGN: MODELLING AND DECISION. (3) (3-3-3) 3-D geometric modelling for design; principles and practice. Selected topics/case studies requiring use of: 3-D CAD; component selection and integration; use of machine element design analysis software; practice in developing simple applications. Use of modern software for design decision making. Introduction to mechanism animation. Introduction to design for NC production.

MECH 541 KINEMATIC SYNTHESIS. (3) (3-0-6) (Prerequisite: MECH 309 or permission of the instructor.) Outline of kinematic synthesis and its applications. Degree of freedom, kinematic pairs and bonds. Function-generation problems: Synthesis matrix, transmission quality, six-bar linkages. Rigid-body guidance problem: Planar and spherical Burmester problem; centre-point and circle-point curves. Path generation problem and planar, spherical and spatial coupler curves. Cam mechanisms.

MECH 542 SPACECRAFT DYNAMICS. (3) (3-0-6) (Prerequisite: MECH 220. Corequisite: MECH 412 or MECH 419) Review of central force motion; Hohmann and other coplanar transfers, rotation of the orbital plane, patched conic method. Orbital perturbations due to the earth's oblateness, solar-lunar attraction, solar radiation pressure and atmospheric drag. Attitude dynamics of a rigid spacecraft; attitude stabilization and control; attitude manoeuvres; large space structures.

MECH 543 DESIGN WITH COMPOSITE MATERIALS. (3) (3-3-3) (Prerequisite: MECH 530) Material systems/selection process. Cost vs performance. Laminate layup procedures. Theory and application of filament winding of composite cylinders. Regular oven and autoclave oven curing, analysis of resulting material performance. Practical design considerations and tooling. Analysis of environmental considerations. Joining techniques. Analysis of test methods. Theory of repair techniques.

MECH 545 ADVANCED STRESS ANALYSIS. (3) (3-1-5) (Prerequisites: CIVE 207 and MECH 321) Tensor Analysis: Review of continuum mechanics. Equilibrium and constitutive equations in tensor form. Finite element methods. Torsion of non-circular cross-sections; spherical problems; advanced Airy stress function problems. Introduction to plates and shells. Thermal deformations and stresses. Introduction to plasticity and viscoelasticity.

MECH 552 ADVANCED APPLIED MATHEMATICS. (3) (3-1-5) (Prerequisite: MECH 452) Solutions of ordinary differential equations using integral methods; asymptotic series, Stirling's approximation. Bes-

sel and Laguerre functions. Green's functions. Laplace, Helmholtz, diffusion, wave, telegraph partial differential equations. Variational methods. Numerical solutions to partial differential equations.

MECH 554 MICROPROCESSORS FOR MECHANICAL SYSTEMS. (3) (2-3-4) (Prerequisites: MECH 383 and COMP 208) Digital logic and circuits - asynchronous and synchronous design. Microcontroller architectures, organization and programming - assembly and high-level. Analog/ digital/hybrid sensors and actuators. Sensing and conditioning subsystems. Interfacing issues. Real-time issues. Operator interfaces. Laboratory exercises on digital logic design, interfacing and control of peripherals with a final team project.

MECH 557 MECHATRONIC DESIGN. (3) (3-1-5) (Prerequisites: ECSE 461, MECH 383 and MECH 412) Team project course on the design, modelling, model validation, and control of complete mechatronic systems, constructed with modern sensors, actuators, real-time operating systems, embedded controllers, and intelligent control.

MECH 561 BIOMECHANICS OF MUSCULOSKELETAL SYSTEMS. (3) (3-0-6) (Prerequisites: MECH 321, MECH 315 or MECH 412) The musculoskeletal system; general characteristics and classification of tissues and joints. Biomechanics and clinical problems in orthopaedics. Modelling and force analysis of musculoskeletal systems. Passive and active kinematics. Load-deformation properties of passive connective tissue, passive and stimulated muscle response. Experimental approaches, case studies.

MECH 562 ADVANCED FLUID MECHANICS. (3) (3-0-6) (Prerequisite: MECH 452 or permission of the instructor.) Conservation laws, control volume analysis, Navier Stokes equations, dimensional analysis and limiting forms of N-S equation, laminar viscous flows, boundary layer theory, inviscid potential flows, lift and drag, introduction to turbulence.

MECH 565 FLUID FLOW AND HEAT TRANSFER EQUIPMENT. (3) (3-1-5) (Prerequisites: MECH 240, MECH 309, MECH 331, MECH 341, MECH 346 or permission of the instructor.) Pipes and piping systems, pumps, and valves. Fans and building air distribution systems. Basic thermal design methods for fins and heat exchangers. Thermal design of shell-and-tube and compact heat exchangers.

MECH 572 INTRODUCTION TO ROBOTICS. (3) (3-0-6) (Prerequisites: MATH 266 and MECH 220 or permission of the instructor) (Not open to students who have taken MECH 573) Manipulator hardware structure, kinematics, statics, dynamics planning and control. Rigid-body, three-dimensional statics, kinematics and dynamics. Direct and inverse kinematics and dynamics. Trajectory planning subject to constraints. Manipulator control. In depth study of serial manipulators with extension to more complex robotic devices.

MECH 573 MECHANICS OF ROBOTIC SYSTEMS. (3) (3-0-6) (Prerequisite: MECH 309 or permission of the instructor) Numerical methods for the kinematic inversion of serial manipulators. The handling of redundancies and singularities. Kinematics and dynamics of parallel manipulators, manipulator performance evaluation and optimization, multifingered hand grasping and manipulation, robot compliant and constrained motion. Obstacle avoidance.

MECH 576 COMPUTER GRAPHICS AND GEOMETRICAL MODELLING. (3) (2-3-4) (Prerequisites: MATH 266 and MECH 290 or MECH 291, MECH 309 or permission of the instructor.) Review of pertinent linear algebra and projective geometry. Explicit, implicit and parametric polynomial forms. Splines: curves and surfaces. Properties: curvature, twist, continuity. Ruled surfaces and other quad patches. Constructive solid models; Octree/Voxel, sweep wire frame, Boolean, boundary representation. Mechanical Engineering applications.

MECH 577 OPTIMUM DESIGN. (3) (2-3-4) (Prerequisite: MECH 309 or permission of the instructor.) The role of optimization within the design process: Design methodology and philosophy. Constrained optimization: The Kuhn-Tucker conditions. Techniques of linear and non-linear programming. The simplex and the complex methods. Sensitivity of the design to manufacturing errors. Robustness of the design to manufacturing and operation errors.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MECH 578 ADVANCED THERMODYNAMICS. (3) (3-0-6) Review of classical mechanics; Boltzmann statistics, thermodynamics of ideal gases; Fermi-Dirac and Bose-Einstein statistics, Gibbsian ensembles; elementary kinetic theory of transport processes, Boltzmann equation, Boltzmann H-theorem and entropy, KBG approximation, discussion on the solution of Boltzmann equation; Maxwell transport equations, derivation of Navier Stokes equations.

MIME – Mining, Metals, Materials Engineering

Offered by: Department of Mining, Metals and Materials Engineering

Former Teaching Unit Code: 306

MIME courses are numbered to conform with the following classification system. The first digit is the level of instruction. The last two digits are classified as follows:

- 00 to 19 Common foundation courses
- 20 to 39 Mining courses
- 40 to 49 Mineral processing courses
- 50 to 59 Extractive and process metallurgy courses
- 60 to 69 Materials engineering courses
- 80 to 99 Co-op work terms

MIME 200 INTRODUCTION TO THE MINERALS INDUSTRY. (3) (3-3-3) Economic importance of minerals industry. Mining: legislation, regulations: criteria for exploiting an ore: mining methods, equipment. Extractive metallurgy: mineral processing, hydrometallurgy, pyrometallurgy; Environmental protection.

MIME 202 ENGINEERING COMMUNICATION SKILLS. (2) (1-2-3) Basic forms of engineering communication: memoranda, executive summaries, letters, proposals, evaluations, oral presentations and presentation graphics, email, groupware, workflow, internet, graphics and presentation tools. Adaptation into engineering. Short assignments and oral presentations.

MIME 203 MINE SURVEYING. (2) (Prerequisite: MIME 200 or permission of instructor) A two-week field school with laboratories and assignments. The role of the mine surveyor. Techniques and instrumentation for measurement of levels, angles and distances. Shaft, raise, drift and stope surveying techniques. Graphical presentation of survey data and computer applications. Monitoring techniques for mining excavations with deformation and displacement measurements.

MIME 209 MATHEMATICAL APPLICATIONS. (3) (3-2-4) Introduction to stochastic modelling of mining and metallurgical engineering processes. Description and analysis of data distributions observed in mineral engineering applications. Modelling with linear regression analysis. Taylor series application to error and uncertainty propagation. Metallurgical mass balance adjustments.

MIME 212 ENGINEERING THERMODYNAMICS. (3) (3-1-5) Macro versus microscopic approach: patterns of Nature. First and second laws and their use. Property relationships: free energies, chemical potentials, activities, heat capacity. Chemical equilibrium. Reaction kinetics. Phase equilibrium for a pure substance. Experimental methods. Engineering applications: high-temperature metallurgical reactors, turbines, mixtures and solutions, phase diagrams, superconductivity.

MIME 221 ENGINEERING PROFESSIONAL PRACTICE. (2) (3-1-2) Introduction to the engineering profession. Rights and code of conduct for students. Regulation of the engineering profession. Law/liability. Principles of engineering ethics. Ethical problems of engineers in industry, management, and private practice. The engineer's duty to society and the environment. Occupational health and safety. Engineering case histories.

MIME 260 MATERIALS SCIENCE AND ENGINEERING. (3) (2-2-5) Structure properties and fabrication of metals, polymers, ceramics, composites; engineering properties: tensile, fracture, creep, oxidation, corrosion, friction, wear; fabrication and joining methods; principles of materials selection.

MIME 261 STRUCTURE OF MATERIALS. (3) Classification of materials, electrons in atoms, molecules and solids, bonding in solids, elements of crystallography, common crystal structures, atoms positions, directions and planes in crystal structures, defects in crystalline solids, point defects, dislocations, structure of polycrystalline materials, grains, grain boundaries, non-crystalline solids.

MIME 280 INDUSTRIAL TRAINING 1. (2) 2 Four-month work period in industry. Work term report required upon completion.

MIME 290 INDUSTRIAL WORK PERIOD 1. (2) (Prerequisites: MIME 200 or MIME 203) A four-month work period in the mineral industry, to expose the student to an industrial environment. Candidates will receive basic industrial training. A complete report must be submitted at the end of the term.

MIME 291 INDUSTRIAL WORK PERIOD 2. (2) (Prerequisite: MIME 290) A four-month industrial work period in a mining company, research laboratory or government agency. The student will receive formal industrial training in a technical position. A complete report must be submitted at the end of the term.

● **MIME 308 SOCIAL IMPACT OF TECHNOLOGY.** (3) (3-0-6) (Enrolment encouraged by students outside the Faculty of Engineering)

MIME 310 ENGINEERING ECONOMY. (3) (3-1-5) Introduction to the basic concepts required for the economic assessment of engineering projects. Topics include: accounting methods, marginal analysis, cash flow and time value of money, taxation and depreciation, discounted cash flow analysis techniques, cost of capital, inflation, sensitivity and risk analysis, analysis of R and D, ongoing as well as new investment opportunities.

MIME 311 MODELLING AND AUTOMATIC CONTROL. (3) (3-2-4) (Prerequisite: COMP 208) Mass and energy conservation laws. Dynamic versus steady state models, dynamic behaviour of first and higher order metallurgical systems, linear and nonlinear models, interacting and noninteracting systems. Laplace domain dynamics and transfer functions. Feedback control, control valves and controllers, transducers. Feedback-feedforward control, introduction to cascade, adaptive and statistical control strategies. Digital computer control, instruments and interfaces.

● **MIME 314 TECHNICAL REPORT.** (2)

● **MIME 317 ANALYTICAL AND CHARACTERIZATION TECHNIQUES.** (3) (2-3-4) (Prerequisite: MIME 261)

MIME 320 EXTRACTION OF ENERGY RESOURCES. (3) (3-0-6) The extraction of energy resources, i.e. coal, gas, oil and tar sands. After a brief geological review, different extraction techniques for these substances will be discussed. Emphasis on problems such as northern mining and offshore oil extraction with reference to Canadian operations. Transportation and marketing.

MIME 322 ROCK FRAGMENTATION. (3) (3-3-3) (Prerequisite: MIME 200) Principles of drilling, penetration rates, performance and factors to consider in the choice of a drilling method. Characteristics of explosives, firing systems and blast patterns. Blasting techniques in surface and underground workings and in permafrost. Special blasting techniques at excavation perimeters. Vibration and noise control. Economics of drill/blast practice, interface with transport and crushing systems. Legislation and safety in explosives use and handling. Ripping and fullface boring machines.

MIME 323 ROCK AND SOIL MASS CHARACTERIZATION. (3) (3-3-3) (Prerequisites: EPSC 221 and MIME 200) Characteristics of soil and rock masses and the stability of mine workings. Mechanical properties of rocks and soils related to physical/chemical properties. Characterization of rock mass discontinuities. Laboratory and in-situ techniques to define mechanical properties of soils, rocks and discontinuities. Permeability and groundwater flow principles. In-situ stresses and their measurement. Rock mass quality and classification systems.

MIME 325 MINERAL INDUSTRY ECONOMICS. (3) (3-2-4) (Prerequisite: MIME 310) Geographical distribution of mineral resources. Production, consumption and prices of minerals. Market structure of selected minerals. Economic evaluation aspects: grade-tonnage considerations; capital and operating cost estimation; assessment of market conditions; estimation of revenue; taxation; sensitivity

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and risk analyses; economic optimization of mine development and extraction.

MIME 333 MATERIALS HANDLING. (3) (3-3-3) (Prerequisite: MIME 200) Physical and mechanical characteristics of materials related to loading, transport and storage. Dynamics of particles, systems and rigid bodies, mass-acceleration, work-energy, impulse-momentum. Types and selection of excavation and haulage equipment. Layout of haul roads. Rail transport. Conveyor belts and chain conveyors. Mine hoists. Layouts of mine shafts.

MIME 337 ELECTROTECHNOLOGY. (2) (3-1-2) Emphasises role of electrical equipment in the mining, metals and materials industry sectors. Operating theory and technical standards of prime electrical equipment, transformers, motors, generators, rectifiers, variable speed drives, circuit breakers, starters. DC and AC theory for circuit components, resistance, capacitance, inductance and impedance. Distribution system single line diagrams.

MIME 340 APPLIED FLUID DYNAMICS. (3) (3-3-4) (Prerequisite: CIVE 205) Flow analysis and manometry. Conservation of mass and momentum. Flow in pipes and ducts, analysis of pipe networks. First and second law of thermodynamics and their applications. Open channel flows. Dimensional analysis and similitude. Flow measurements. Settling and separation of particles. Non-Newtonian flow and slurry transport. Fluidized beds. Filtration of liquid/solid mixtures.

MIME 341 INTRODUCTION TO MINERAL PROCESSING. (3) (2-3-4) (Prerequisite: MIME 250) Theory and practice of unit operations including: size reduction-crushing and grinding; size separation-screening and classification; mineral separation-flotation, magnetic and gravity separation. Equipment and circuit design and selection. Mass balancing. Laboratory procedures: grindability, liberation, magnetic and gravity separation, flotation, and solid-liquid separation.

MIME 350 EXTRACTIVE METALLURGICAL ENGINEERING. (3) (2-3-4) (Prerequisites: MIME 250, MIME 212) Principle non-ferrous base-metal pyrometallurgical extraction processes, relevant thermodynamics, heat and mass balances, transport phenomena (copper, nickel, lead, zinc, aluminum, magnesium). Ores, gangue, fuels, slag, fluxes, recovery, refining, minor elements, byproducts and the environment. Roasting, drying, smelting, converting, reverberatory furnaces, flash furnaces, continuous and batch operations, injection practices and oxygen enrichment. Simulation, modelling, control and optimization.

MIME 351 NON-FERROUS EXTRACTIVE METALLURGY. (3)

MIME 352 HYDROCHEMICAL PROCESSING. (3) (3-2-4) (Prerequisites: CHEM 233, MIME 212, MIME 250) (Corequisite: MIME 355) Analysis and description of dissolution (leaching), solute separation (solvent extraction, ion exchange, carbon adsorption) and deposition operations (precipitation, crystallization, electrolysis) in aqueous reaction media as these apply to: (i) the hydrometallurgical extraction of metals from primary/secondary sources; (ii) the treatment of effluents and (iii) the production of inorganic materials.

● **MIME 354 PROCESS ENGINEERING LABORATORY.** (2) (0-3-3) (Prerequisite: MIME 355)

● **MIME 355 HEAT, MASS AND FLUID FLOW.** (3) (3-3-3) (Prerequisites: MIME 212, MATH 261)

MIME 356 HEAT, MASS AND FLUID FLOW. (4) (4-4-4) (Restrictions: Not open to students who have taken MIME 355.) (Prerequisites: MIME 212, MATH 261) Fluid statics and dynamics. Newton's laws of viscosity and motion, control volume analyses. Navier Stokes, Euler, Bernoulli and Steady Flow Energy Equations. Turbulence and Reynolds stress equations. Molecular conduction/diffusion processes in heat and mass transfer). Convective flows. Transport coefficients in slags, metals and gases. Radiative heat transfer. Transient/steady state flow.

MIME 360 PHASE TRANSFORMATIONS: SOLIDS. (3) (2-3-4) (Prerequisites: MIME 212 and MIME 260, CHEM 233) Free energy (equilibrium) and kinetic (non-equilibrium) considerations, phase diagrams and TTT diagrams, solid state diffusion, diffusional (nucleation and growth) and shear (martensitic) transformations.

● **MIME 361 LIQUID STATE PROCESSING OF MATERIALS.** (3) (2-3-4) (Prerequisites: MIME 260, MIME 360)

MIME 362 MECHANICAL PROPERTIES. (3) (2-3-4) (Prerequisite: MIME 360) Stress-strain behaviour. Elasticity and plasticity of metals, ceramics and polymers. Dislocations theory. Single crystal and polycrystalline slip. Mechanical twinning. Strengthening mechanisms. Process-property and microstructure-property relationships. Notch toughness and fracture mechanics. Failure, fracture and damage accumulation. Fatigue. Creep and creep rupture. Fractography. Design considerations in materials selection.

MIME 367 ELECTRONIC PROPERTIES OF MATERIALS. (3) (3-3-3) (Prerequisite: MIME 260) Structure of materials, electronic structure, electrical and thermal conductivity, semiconducting materials, fundamentals of magnetism, hard and soft magnetic materials, superconductivity and superconductive materials, dielectric materials, optical properties of materials, thermoelectricity. Advanced materials and their technological applications.

MIME 380 INDUSTRIAL TRAINING 2. (2) (2) Four-month work period in industry. Work term report required upon completion.

MIME 392 INDUSTRIAL WORK PERIOD 3. (2) (Prerequisite: 75 credits including MIME 291) A four-month industrial work period in a mining company, research laboratory or government agency. Based on the experience gained during the first two work periods, the student may be asked to undertake more challenging technical tasks. A complete report must be submitted at the end of the term.

MIME 410 RESEARCH PROJECT. (3) (0-6-3) (Prerequisite: Recommendation of Instructor) A research project will be carried out, usually in groups, under the guidance of a staff member. A technical report will be prepared at the end and formal presentation will be made on the research topic.

MIME 412 CORROSION AND DEGRADATION. (3) (2-3-4) (Prerequisites: MIME 260; MIME 352) Electrochemical principles of metal oxidation in aqueous environments, Use of polarization diagrams for corrosion rate prediction. Characteristics of stress corrosion and related phenomena. High temperature, non-aqueous degradation; growth kinetics and structure of oxide films. Corrosion prevention in aqueous systems; fundamentals and applications of cathodic and anodic protection, inhibitors, metallic coatings and industrial priming paints. Use of non-metallics and their degradation; glasses, cement, plastics. Corrosion as a factor in selection of materials; use of iso-corrosion charts.

MIME 419 SURFACE MINING. (3) (3-3-3) (Prerequisites: MIME 322, MIME 333 and MIME 325) Choice of a surface mining method. Analysis of soil and rock mass properties related to surface mining. Calculation and monitoring of stripping ratios, ultimate pit depth, slope stability, rock reinforcement, bench and berm dimensioning and ramp design. Loading and hauling systems. Surface layout and development. Water drainage systems. Production and cost analysis. Computerized design techniques.

MIME 420 FEASIBILITY STUDY. (3) (1-2-6) (Prerequisites: MIME 419, MIME 426 and MPMC 421) This course consists of a case study exercise in the application of the specialist skills which the student has developed in the mining engineering program. The objective is to combine these skills in carrying out a professional appraisal of the technical feasibility and economic viability of developing a mineral deposit. Students are required to prepare a professional level report and present seminars on particular aspects of the feasibility analysis.

MIME 426 DEVELOPMENT AND SERVICES. (3) (3-3-3) (Prerequisites: MIME 324 and MIME 333) Selection and design of the facilities required to start production at both surface and underground mines, based on design criteria dictated by mining plans, geography, geology and government regulations. Scheduling of development and construction. Staffing and health and safety considerations during development, construction and operations.

MIME 442 MODELLING AND CONTROL: MINERAL PROCESSING. (3) (3-3-3) (Prerequisite: MIME 341) Basic kinetic modelling: perfect mixers, plug-flow, zero and first-order kinetics, residence time distributions. Grinding: breakage and selection functions. Overview of

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

the modelling of flotation and gravity separation. Introduction to control: economic incentives, basic PI control, applications to grinding and flotation circuits.

MIME 450 PROCESS DESIGN. (3) (3-0-6) (Prerequisites: MIME 350, MIME 355) Design of new metallurgical plants, processes and products based on knowledge acquired in previous core courses. Material and heat balances, metal economics, design and optimization.

MIME 451 ENVIRONMENTAL CONTROLS: MET'L PLANTS. (3) (3-2-4) (Prerequisite: MIME 352) A survey of the mineral/metallurgical industries from the standpoint of environmental impact and control. Characterization of gaseous, aqueous and solid wastes. Their effects on the ecosystem and government regulations. Methods of control: Particulate collection and detoxification of gaseous streams; Aqueous effluent treatment techniques; Disposal of solid wastes and their stability/containment.

MIME 455 ADVANCED PROCESS ENGINEERING. (3) (3-1-5) (Prerequisite: MIME 355) Transport phenomena in non-idealized systems. Solutions for transient heat and mass transfer processes involving thermal and molecular diffusion in materials processing systems. Natural and forced convection in heat and mass transfer. Dimensionless correlations. Fick's Laws and Fourier's Laws. Exact solutions. Numerical approximations for transient systems. Equivalences between heat and mass transfer. Finite difference modelling of conduction, convection and radiation heat transfer and diffusion and convection mass transfer.

MIME 456 STEELMAKING AND STEEL PROCESSING. (3) (2-2-5) (Prerequisites: MIME 360, MIME 455) The production and refining of liquid iron in the iron blast furnace, the production and refining of liquid steel, secondary refining operations, continuous casting and thermomechanical processing (hot rolling). Specialty steels and newly emerging technologies (e.g. thin slab casting, direct ironmaking) are also discussed in terms of process/environment and productivity. "Downstream" topics will include cold rolling, batch and continuous annealing, and coating operations.

MIME 457 LIGHT METALS EXTRACTION AND PROCESSING. (3) (2-0-7) (Prerequisites: MIME 350, MIME 352) (Permission of the instructor required.) Physicochemical, kinetic and economic aspects of light metals extraction, refining and finishing for marketing. Alumina production, aluminum electrolysis, carbon technology, alloying and casting, magnesium smelting and electrolysis, strontium, lithium, sodium extraction.

MIME 463 DEFORMATION PROCESSING OF METALS. (3) (3-3-3) (Prerequisite: MIME 362) Basic plasticity theory (yield criteria, plastic stress/strain relationships, etc.); friction and lubrication; analysis of simple forming operations, e.g. rolling of flat products. Workability; concept and measurement; effect of process variables, material properties and microstructure. Effect of hot and cold processing on microstructure and properties technology and equipment; computer-aided design of deformation processing.

MIME 465 CERAMIC ENGINEERING. (3) (2-3-4) (Prerequisite: MIME 360) Classification of technical ceramics, refractories and glasses. Powder metallurgy. Structure and bonding of ceramics and glasses. Common crystal structures. Physical properties. Mechanical properties and fracture behaviour. Powder processing and consolidation techniques. Sintering and densification of powders. Refractories: production and applications. Glass forming systems, processing and properties.

MIME 480 INDUSTRIAL TRAINING 3. (2) (See details listed under MIME 481) Four-month work period in industry. Work term report due upon completion of MIME 481.

MIME 481 INDUSTRIAL TRAINING 4. (2) Four-month work period in industry. This course is intended to be taken immediately after MIME 480 at the same work location. One work term report and one seminar is required upon completion of this course. If MIME 480 and MIME 481 are in different work locations, the work term report should be in two parts following the co-op handbook guidelines.

MIME 484 MINING PROJECT. (3) (0-0-9) (Corequisites: MIME 419, MIME 426, MPMC 328 and MPMC 421) A mining research project

to be completed during one semester. The project must be approved by an academic advisor. A comprehensive report and a seminar presentation are required for the project.

MIME 494 INDUSTRIAL WORK PERIOD 4. (2) (Prerequisites: MIME 419, MIME 426, MPMC 328 and MPMC 421) A four-month industrial work period after which the student must submit a report.

● **MIME 515 ADVANCED METALLURGICAL AND MATERIALS THERMODYNAMICS.** (3) (2-2-5) (Prerequisite: MIME 212)

MIME 520 STABILITY OF ROCK SLOPES. (3) (3-0-6) (Prerequisite: permission of instructor.) The properties of rock masses and of structural discontinuities. Influence of geological structure on stability. Linear, non-linear, and wedge failures. Site investigations. Methods of slope stabilization.

MIME 521 STABILITY OF UNDERGROUND OPENINGS. (3) (3-3-3) (Prerequisite: permission of instructor) The properties of rock masses and stability classification systems. The influence and properties of geological structural features. Stability related to the design of underground openings and mining systems. Site investigations. Methods of stabilization.

MIME 526 MINERAL ECONOMICS. (3) (3-2-5) (Prerequisite: MIME 310 or equivalent) Mineral project evaluation techniques and applications. Topics covered include grade-tonnage relationships, capital and operating cost estimation techniques, assessment of mineral market conditions, taxation, discounted cash flow analysis, risk analysis, and optimization of project specifications with respect to capacity and cutoff grade.

● **MIME 528 MINING AUTOMATION.** (3) (3-3-3) (Prerequisite: MIME 426)

MIME 544 ANALYSIS: MINERAL PROCESSING SYSTEMS 1. (3) (2-3-4) (Prerequisite: MIME 341) The course covers three main topics: principles of separation, including data presentation, properties of recovery/ yield plots, technical and economic efficiency and identification of limits to separation; column flotation, hydrodynamics of collection and froth zones, mixing, scale-up and design, measurements and control; surface and electrochemistry, including absorption, surface charge, coagulation, electron transfer reactions, electrochemistry in plant practice.

MIME 545 ANALYSIS: MINERAL PROCESSING SYSTEMS 2. (3) (4-2-3) (Prerequisite: MIME 341) Gold recovery (as a Professional Development Seminar): methods of recovery (gravity, flotation, cyanidation), refractory gold (roasting, pressure oxidation, bacterial leaching), dissolved gold recovery (Merrill-Crowe) and activated carbon methods. Sampling: definition of errors, sample extraction, size, and processing. Mass balancing: basic considerations, definition of networks, software. Blending: auto-correlation functions, transfer functions, blending systems. Effect of feed variability.

MIME 551 ELECTROCHEMICAL PROCESSING. (3) (3-2-4) (Prerequisite: MIME 352) Characterization of aqueous, fused salt and solid electrolytes; laws of electrolysis; ion transport mechanisms; interfacial phenomena (electrolyte-electrolyte, electrode-electrolyte); reversible cells and potentials; electrode kinetics, overpotential and potential-current laws; industrial applications; electrolytic winning and refining, electroplating, surface cleaning and coating, electro-dialysis and electrochemical sensors.

MIME 553 IMPACT OF MATERIALS PRODUCTION. (3) (3-0-6) (Prerequisite: Permission of instructor.) Impact on the environment of the production of major materials. Pollution control practices, emerging technologies, cost, resources and conservation. Review of flow-sheets for various production methods. Analysis of the use of materials, prices, consumption, fabrication, and recycling of waste materials.

● **MIME 555 THERMAL REMEDIATION OF WASTES.** (3) (3-0-6) (Prerequisites: CHEM 111 and MIME 212 or equivalent)

MIME 560 JOINING PROCESSES. (3) (3-3-3) (Prerequisite: MIME 361 or equivalent) Physics of joining; interfacial requirements; energy sources, chemical, mechanical and electrical; homogeneous hot-joining, arc-, Mig-, Tig-, gas-, thermite- and Plasma-welding; Autogeneous hot-joining, forge-, pressure-, friction-, explosive-, electron beam- and laser-welding; Heterogeneous hot-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

joining, brazing, soldering, diffusion bonding; Heterogeneous cold joining, adhesives, mechanical fastening; Filler materials; Joint metallurgy; Heat affected zone, non-metallic systems; joint design and economics; defects and testing methods.

MIME 561 ADVANCED MATERIALS DESIGN. (3) (0-4-5) (Prerequisite: MIME 362 or equivalent) Advanced topics in materials design problems. Discussion and laboratory work, supplemented by detailed technical reports. Special attention is given to selection, design and failure problems in various materials systems.

MIME 563 HOT DEFORMATION OF METALS. (3) (2-2-5) (Prerequisite: MIME 463 and MIME 360) High temperature deformation processing of metallic materials. Topics include static and dynamic recrystallization, recovery, precipitation; effect of deformation on phase transformations and microstructural evolution during industrial processing. Mathematical modelling of microstructural evolution.

MIME 564 X-RAY DIFFRACTION ANALYSIS OF MATERIALS. (3) (2-3-4) (Prerequisite: MIME 317 or equivalent) The techniques of X-ray and neutron diffraction are discussed as applied to the minerals and materials production industries. Special emphasis is placed upon automated X-ray powder diffractometry as employed for determining the structure and composition of materials. The application of X-ray techniques to studies of crystal structure, crystal orientation, residual stress, short-range order in liquid metals, phase diagram determination, order-disorder transformation and chemical analysis are presented.

MIME 566 TEXTURE, STRUCTURE & PROPERTIES OF POLYCRYSTALLINE MATERIALS. (3) (2-3-4) (Prerequisite: MIME 317) Concepts and quantitative methods for the description of the structure of minerals and materials are discussed. Special emphasis is placed on experimental techniques of texture measurement. Procedures are demonstrated for the control of deformation and recrystallization textures in order to obtain the properties required of industrial products. Finally, the correlation between texture and the anisotropy of elastic, plastic and magnetic properties of engineering materials is described and analyzed.

● **MIME 567 ALUMINUM CASTING ALLOYS.** (3) (3-0-6) (Prerequisite: MIME 361 or equivalent)

● **MIME 568 TOPICS IN ADVANCED MATERIALS.** (3) (Prerequisite: MIME 362 or equivalent)

MIME 569 ELECTRON BEAM ANALYSIS OF MATERIALS. (3) (2-3-4) (Prerequisite: MIME 317) Emphasis on operation of scanning and transmission electron microscopes. Topics covered are electron/specimen interactions, hardware description; image contrast description; qualitative and quantitative (ZAF) x-ray analysis; electron diffraction pattern analysis.

MPMC – McGill/Poly Mining Coop

Offered by: Département des génies civil, géologique et des mines; École Polytechnique

Former Teaching Unit Code: 309

MPMC courses are associated with the CO-OP program in Mining Engineering.

MPMC 320 CAO ET INFORMATIQUE POUR LES MINES. (3) (2-3-4) Présentation de techniques informatisées et de logiciels permettant d'appliquer l'informatique dans le cadre des diverses opérations reliées à l'exploitation des mines. Utilisation de logiciels de support: chiffrier électronique, traitement de texte, éditeur graphique, utilitaires de DOS. Utilisation de graphisme, de traceurs à plumes, de tablettes numérisantes, d'interfaces pour capteurs analogique/numérique et numérique/ analogique. Notions de géométrie descriptive appliquées à des problèmes miniers.

MPMC 321 MÉCANIQUE DES ROCHES ET CONTRÔLE DES TERRAINS. (3) (3-3-3) (Prerequisite: MIME 323) Pressions de terrains au pourtour des excavations: solutions analytiques et numériques. Stabilité des excavations souterraines et à ciel ouvert: analyse des instabilités structurales par projection stéréographique méridienne, ana-

lyse des instabilités causées par les excès de contraintes. Soutènement. Surveillance. Études de cas.

MPMC 326 RECHERCHE OPÉRATIONNELLE I. (3) (3-3-3) (Prerequisite: MATH 260) Logistique minière. Modèles de localisation optimale: Steiner, HAP, construction itérative. Modèles de détermination des contours optimaux des exploitations à ciel ouvert: conventionnels, Lerchs et Grossman, Ford et Fulkerson. Programmation dynamique et modèles d'optimisation du taux de production et de la teneur de coupure. Modèles de planification: cheminement critique et PERT, programmation linéaire et non-linéaire, théorie des graphes. Modèles de capacité: théorie des files d'attente, simulation, silos et stockage. Modèles de mélange.

MPMC 327 HYDROGÉOLOGIE APPLIQUÉE. (3) (3-3-3) (Prerequisite: EPSC 221 et MATH 261) Eau souterraine et cycle hydrologique. Aquifère et aquitard. Charge hydraulique et piézomètre. Mouvement de l'eau souterraine. Loi de Darcy. Mesures et valeurs de perméabilité. Réseau d'écoulement. Essais de pompage: régime transitoire permanent, effet de frontière, drainage. Facteurs influençant les niveaux d'eau. Qualité des eaux souterraines. Types de polluants et leur propagation. Méthodes de traitement et d'étanchéisation. Techniques de modélisation. Exploration et gestion des eaux souterraines. Recharge artificielle. Intrusions salines.

MPMC 328 ENVIRONNEMENT ET GESTION DES REJETS MINIERS. (3) (3-3-3) (Prerequisite: MIME 200 et MIME 291) Effets du milieu de travail sur l'homme (hygiène du travail): législation; contraintes thermiques, problèmes de bruit, de contaminants gazeux et de poussières; techniques de mesures. Effets de l'exploitation d'une mine sur le milieu (environnement et écologie): législation; études d'impacts; effluents miniers: origine, nature et traitement des effluents; entreposage des résidus; restauration des sites.

MPMC 329 GÉOLOGIE MINIÈRE. (2) (2-2-2) (Prerequisite: EPSC 221, MIME 200 et MIME 209) Méthodes de cartographie minière, de sondages et d'échantillonnage. Notion de teneur de coupure, calcul des réserves par les méthodes conventionnelles. Évaluation des réserves par les méthodes géostatistiques.

MPMC 330 GÉOTECHNIQUE MINIÈRE. (3) (3-3-3) (Prerequisite: MIME 323) Propriétés mécaniques des matériaux meubles. Conception d'empilements et de digues de retenue pour les matériaux miniers. Conception de structures enfouies. Problèmes particuliers avec les résidus miniers: liquéfaction, déposition, etc. Écoulement gravitaire des matériaux meubles.

MPMC 421 EXPLOITATION EN SOUTERRAIN. (3) (3-3-3) (Prerequisite: MIME 322, MIME 325 et MIME 333) Étude des caractéristiques des principales méthodes d'abattage utilisées en souterrain. Méthodes d'analyse simplifiée d'un gisement quant à son exploitation en fosse ou en souterrain. Dimensionnement des ouvrages et choix des équipements. Calculs des quantités, des équipements et des coûts reliés aux excavations souterraines. Conception d'un circuit de remblai hydraulique.

MPMC 422 VENTILATION MINIÈRE ET HYGIÈNE DU TRAVAIL. (3) (3-3-3) (Prerequisite: MIME 340) Description des composantes d'un système de ventilation. Ventilation naturelle et mécanique. Principes de mesure et de modélisation des écoulements de l'air dans les réseaux de ventilation. Techniques de calcul des pertes de charges dans un circuit. Choix des composantes pour assurer et régulariser les écoulements. Simulation informatisée des écoulements. Chauffage de l'air.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

URBP – Urban Planning

Offered by: School of Urban Planning
Former Teaching Unit Code: 409

URBP 501 PRINCIPLES AND PRACTICE 1. (2) This six-week intensive course exposes students to issues and techniques that are applicable in diverse professional planning contexts. The subject matter, geographic area, scale of intervention and institutional location of planning varies from semester to semester. The course focuses on a specific case study and is taught by a visiting lecturer with professional experience in the selected subject matter.

McGill School of Environment**ENVR – Environment**

Offered by: McGill School of Environment
Former Teaching Unit Code: 170

Note: All ENVR courses, regardless of where they are taught, are considered to be courses taught by the Faculty of Science.

ENVR 200 THE GLOBAL ENVIRONMENT. (3) (Fall) (Section 01: Downtown Campus) (Section 51: Macdonald Campus) A systems approach to study the different components of the environment involved in global climate change: the atmosphere, biosphere, hydrosphere, and lithosphere. The interactions among these components. Their role in global climate change. The human dimension to global change.

ENVR 201 SOCIETY AND ENVIRONMENT. (3) (Fall) (Section 01: Downtown Campus) (Section 51: Macdonald campus) An introduction to human societies and their relations with the biophysical environment, focusing on how economy, technology, and institutions interact to give rise to environmental problems. Analytical treatment of key concepts from distinct disciplinary perspectives in the social and life sciences, including "carrying capacity", "renewable resources", "environmental equity", and "sustainability".

ENVR 202 THE EVOLVING EARTH. (3) (Winter) (Section 01: Downtown Campus) (Section 51: Macdonald Campus) Formation of the Earth and the evolution of life. How geological and biological change are the consequence of history, chance, and necessity acting over different scales of space and time. General principles governing the formation of modern landscapes and biotas. Effects of human activities on natural systems.

ENVR 203 KNOWLEDGE, ETHICS AND ENVIRONMENT. (3) (Fall - Macdonald Campus; Winter - Downtown) (Section 01: Downtown Campus) (Section 51: Macdonald Campus) Introduction to cultural perspectives on the environment: the influence of culture and cognition on perceptions of the natural world; conflicts in orders of knowledge (models, taxonomies, paradigms, theories, cosmologies), ethics (moral values, frameworks, dilemmas), and law (formal and customary, rights and obligations) regarding political dimensions of critical environments, resource use, and technologies.

ENVR 301 ENVIRONMENTAL RESEARCH DESIGN. (3) (Winter) (Restrictions: Restricted to U2 or higher. Not open to students who have taken ENVR 380 in 200209 or 200301.) Techniques used in design and completion of environmental research projects. Problem definition, data sources and use of appropriate strategies and methodologies. Principles underlying research design are emphasized, including critical thinking, recognizing causal relationships, ideologies and bias in research, and when and where to seek expertise.

ENVR 380 TOPICS IN ENVIRONMENT 1. (3) (Normally open only to students who have completed MSE U1 core courses) Lectures and discussion of interdisciplinary aspects of current problems in envi-

URBP 505 GEOGRAPHIC INFORMATION SYSTEMS. (3) An introduction to fundamental geographic information system (GIS) concepts and a range of GIS applications in urban and regional planning.

URBP 506 ENVIRONMENTAL POLICY AND PLANNING. (3) (Restriction: This course is open to students in U3 and above) Analytical and institutional approaches for understanding and addressing urban and other environmental problems at various scales; characteristics of environmental problems and implications; political-institutional context and policy instruments; risk perception and implications; cost-benefit analysis, risk assessment, multiple-objectives approaches, life-cycle analysis; policy implementation issues; case studies.

ronment led by staff and/or special guests. This course is offered on an irregular basis.

ENVR 400 ENVIRONMENTAL THOUGHT. (3) (Fall - Macdonald Campus; Winter - Downtown) (Section 01: Downtown Campus) (Section 51: Macdonald Campus) Students work in interdisciplinary seminar groups on challenging philosophical, ethical, scientific and practical issues. They will explore cutting-edge ideas and grapple with the reconciliation of environmental imperatives and social, political and economic pragmatics. Activities include meeting practitioners, attending guest lectures, following directed readings, and organizing, leading and participating in seminars.

ENVR 401 ENVIRONMENTAL RESEARCH. (3) (Fall) (Prerequisite: ENVR 301) (Restricted to B.A. Faculty Program in Environment, B.Sc. and B.Sc. (Ag. Env. Sc.) Major in Environment, and Diploma in Environment) (Downtown Campus only) Students work in an interdisciplinary team on a real-world research project involving problem definition, methodology development, social, ethical and environmental impact assessment, execution of the study, and dissemination of results to the research community and to the people affected. Teams begin defining their projects during the preceding spring.

ENVR 451 RESEARCH IN PANAMA. (6) (Restricted to students in the Panama Field Semester program. Offered in Panama only) Research projects will be developed by instructors in consultation with Panamanian universities, government agencies and non-governmental organizations. Project groups will consist of four to six students working with a Panamanian institution. Topics will be relevant to Panama: e.g., protection of the Canal watershed, economical alternatives to deforestation, etc.

ENVR 465 ENVIRONMENT AND SOCIAL CHANGE. (3) (Students must enroll in Bay of Fundy Field Semester. Offered on Bay of Fundy only.) (Prerequisites: ENVR 201, ENVR 203 and ENVR 202 or permission of instructor) (Corequisites: GEOG 497 and CANS 407 and ENVR 466) Impacts of globalization upon coastal and resource-based communities in terms of relationships between the environment, new technologies and global market. Emphasis is on the complexity of change and the conflicts and compromises inevitable in global-local interactions.

ENVR 466 RESEARCH IN ATLANTIC CANADA. (6) (Restricted to students in Bay of Fundy Field Semester. Offered on Bay of Fundy only.) (Corequisites: GEOG 497 and CANS 407 and ENVR 465) Students will work in teams on research topics relevant to sustainability of regional environments, economies and cultures, such as aquaculture, forestry, traditional fisheries, water quality, and ecotourism.

● **ENVR 480 TOPICS IN ENVIRONMENT 2.** (3) (Normally open only to U3 MSE students)

ENVR 485 READINGS IN ENVIRONMENT 1. (3) (Normally open only to U3 MSE students) Interdisciplinary literature project/essays related to environment, enabling independent study under guidance of qualified MSE staff in areas outside the scope of individual departments. Proposed topic and method of evaluation must be

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

approved by the Associate Director one month before the beginning of term. Contact the Program Coordinator for information.

ENVR 540 ECOLOGY OF SPECIES INVASIONS. (3) (Prerequisite: BIOL 208 or permission of instructor) (Restrictions: Not open to U1 or U2 students. Not open to students who are taking or have taken BIOL 540.) Causes and consequences of invasion, as well as risk assessment methods and management strategies for dealing with this global problem.

Faculty of Management

ACCT – Accounting

Offered by: Management

Former Teaching Unit Code: 271

ACCT 311 FINANCIAL ACCOUNTING 1. (3) (Prerequisite: MGCR 211) A detailed examination of the issues involved in the measurement, recording and reporting of assets and related revenues and expenses.

ACCT 312 FINANCIAL ACCOUNTING 2. (3) (Prerequisite: ACCT 311) A continuation of Financial Accounting 1, examining the issues involved in the measurement, recording and reporting of liabilities and owner's equity.

ACCT 313 MANAGEMENT ACCOUNTING 1. (3) (Prerequisite: MGCR 213. Continuing Education prerequisite: MGCR 211.) Cost accounting, budgeting and budgetary control, standard costing, break-even analysis, variable costing, costs for decision-making.

ACCT 351 INTERMEDIATE FINANCIAL ACCOUNTING 1. (3) (Prerequisites: MGCR 211 and MGCR 213) (Open only to Accounting Honours students) An examination of the theoretical foundation for financial reporting and revenue recognition. The tools of accounting, including a review of the accounting process and compound interest concepts. Asset recognition, measurement and disclosure. Partnership accounting.

ACCT 352 INTERMEDIATE FINANCIAL ACCOUNTING 2. (3) (Prerequisite: ACCT 351) (Open only to Accounting Honours students) A continuation of Intermediate Financial Accounting 1. An examination of liability recognition, measurement and disclosure, including leases, pension costs and corporate income tax. Shareholders' equity, dilutive securities and earnings per share. The statement of changes in financial position, basic financial statement analysis and full disclosure in financial reporting.

ACCT 361 INTERMEDIATE MANAGEMENT ACCOUNTING 1. (3) (Prerequisites: MGCR 211 and MGCR 213) (Open only to Accounting Honours students) The role of management accounting information to support internal management decisions and to provide performance incentives.

ACCT 362 INTERMEDIATE MANAGEMENT ACCOUNTING 2. (3) (Prerequisite: ACCT 361) (Open only to Accounting Honours students) An examination of a number of recurring issues in the area of decision-making and control, including cost allocation, alternative costing systems, and innovations in costing and performance measurement.

ACCT 385 PRINCIPLES OF TAXATION. (3) (Prerequisite: ACCT 351) (Open only to Accounting Honours students) An introduction to the concepts underlying the Canadian tax system and how they are applied in relation to the taxation of individuals and businesses.

ACCT 411 ACCOUNTING THEORY. (3) (Prerequisite: ACCT 312) The course will focus on developing a cohesive body of postulates which describe the discipline of accounting.

ACCT 412 TAXATION 1. (3) An examination of Federal Income Tax and its impact on business operations: tax treatment of individuals, partnerships and corporations. The concepts underlying tax legislation will be emphasized.

● **ENVR 580 TOPICS IN ENVIRONMENT 3.** (3) (Prerequisite: Permission of instructor)

ENVR 585 READINGS IN ENVIRONMENT 2. (3) (Prerequisites: ENVR 400 and ENVR 401, or permission of instructor) Interdisciplinary literature project/essays related to environment, enabling advanced-level study under guidance of qualified MSE staff in areas outside the scope of individual departments. Proposed topic and method of evaluation must be approved by the Associate Director one month before the beginning of term. Contact the Program Coordinator for information.

ACCT 413 SYSTEMS AND AUDITING. (3) (Prerequisite: ACCT 312) The principles of accounting systems and auditing.

ACCT 414 FINANCIAL ACCOUNTING 3. (3) (Prerequisite: ACCT 312) Advanced topics in financial accounting, including consolidations, business combinations, accounting for foreign currency and other topics.

ACCT 415 MANAGEMENT ACCOUNTING 2. (3) (Prerequisite: ACCT 313) A critical evaluation of accounting control systems and some related quantitative business controls. Conceptual and measurement problems in evaluating performance, including problems of decentralization. Control of the data-information flow.

ACCT 416 MANAGEMENT ACCOUNTING 3. (3) (Prerequisite: ACCT 415) A survey of planning and decision concepts and models: relevant data or information for planning common classes of business decisions. Behavioural and information analysis of the planning/control functions using recent literature and research results.

ACCT 417 TAXATION AND BUSINESS DECISIONS. (3) (Prerequisite: MGCR 211) An overview of the income tax system; emphasis on its impact on selected business decisions. Topics include: individual and corporate taxation, tax shelters, tax planning and international operations. Use of cases.

ACCT 430 OPERATIONAL AUDITING. (3) (Prerequisite: ACCT 312) The internal use of auditing techniques to appraise the control provided by accounting and management systems. The challenge of reporting audit findings to prompt management action. Topics: objectives of internal audit, responsibilities and relationships, planning audit projects, preliminary surveys, sampling, computer auditing, operational areas, reporting.

ACCT 431 EXTERNAL AUDITING. (3) (Prerequisite: ACCT 413) Auditing standards; auditor's legal rights and responsibilities; problems relating to: incorporated business; consolidated statements prospectuses; events subsequent to balance sheet date; audit of E.D.P. systems; audits requiring special considerations; investigations and special reports; current developments in auditing standards.

ACCT 434 TOPICS IN ACCOUNTING. (3) (Open to advanced students only) Topics will be selected from current issues in the Accounting Area.

ACCT 453 ADVANCED FINANCIAL ACCOUNTING. (3) (Prerequisites: ACCT 352, ACCT 362 and ACCT 385) (Open only to Accounting Honours students) Reporting relevant financial information subsequent to long term intercorporate investments. The preparation of consolidated financial statements with emphasis on their economic substance rather than legal form.

● **ACCT 454 FINANCIAL REPORTING.** (3) (Prerequisites: ACCT 352, ACCT 362 and ACCT 385) (Open only to Accounting Honours students)

ACCT 455 DEVELOPMENT OF ACCOUNTING THOUGHT. (3) (Prerequisites: ACCT 352, ACCT 362 and ACCT 385) (Open only to Accounting Honours students) The conceptual underpinning of accounting thought, including its historical development and the modifications that have occurred over time. A review of accounting literature and its relevance to practice.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ACCT 463 ADVANCED MANAGEMENT ACCOUNTING. (3) (Prerequisites: ACCT 352, ACCT 362 and ACCT 385) (Open only to Accounting Honours students) The theoretical frameworks for the examination and evaluation of management accounting and control systems. The technical aspects of accounting along with behavioural issues of management control.

ACCT 475 PRINCIPLES OF AUDITING. (3) (Prerequisites: ACCT 352, ACCT 362 and ACCT 385) (Open only to Accounting Honours students) An introduction to basic auditing concepts and internal controls of an accounting system. Topics include current auditing standards, ethical conduct, legal liability, planning of an audit, sampling techniques, non-audit engagements, the study and evaluation of internal controls in an accounting system.

ACCT 486 BUSINESS TAXATION 2. (3) (Prerequisite: ACCT 385.) (Restriction: Elective in Honours Accounting.) A study of the Income Tax Act as it applies to the taxation of individuals and corporations, including capital cost allowances, capital gains, corporate reorganisations, trusts and partnerships and administrative regulations. A review of consumption taxes.

BUSA – Business Administration

Offered by: Management

Former Teaching Unit Code: 270

BUSA 364 BUSINESS LAW 1. (3) (This course cannot be double-counted from the Certificate in Management.) An introduction to the legal system and basic legal principles affecting business. Tort negligence, contracts, forms of business organization, creditors' rights and bankruptcy.

BUSA 368 BUSINESS LAW 2. (3) An outline of the application of law to professional negligence, product liability, competition, corporate governance and employment. Review of particular contracts; sale, agency, mortgages, lease, insurance.

BUSA 391 INTERNATIONAL BUSINESS LAW. (3) (Prerequisite: MGCR 382) (Formerly MGMT 491) Introduction to the legal aspects of foreign trade and investment transactions. Forms and documentation of types of foreign trade contracts. Conflict avoidance, arbitration, and litigation arising from international transactions. Government regulation of foreign trade. Legal aspects of the international transfer of investments and technology. Conventions and institutions of international economic cooperation (e.g. GATT, ICC, IMF, etc.).

BUSA 395 EUROPEAN ECONOMY AND BUSINESS. (3) (Prerequisite: MGCR 382) An overview of current social, economic and trade developments in the rapidly-evolving European arena. Focus on both the integrating economies of the EU and the emerging market economies and central and eastern Europe. Emphasis on the expanded opportunities and the challenges facing international managers.

BUSA 399 INTERNSHIP PROJECT. (1) Upon completion of the internship, students must submit a paper on the integration of the applied and academic aspects of their B.Com. courses and the Internship experience.

BUSA 400 INDEPENDENT STUDIES IN MANAGEMENT. (3) (Prerequisite: U3 students only. CGPA of at least 3.00 required.) Research reading or field projects, permitting independent study under the guidance of a Faculty member. Projects to be arranged individually with instructors. A detailed student proposal must be submitted to the instructor and the Associate Dean during the first week of term.

BUSA 462 MANAGEMENT OF NEW ENTERPRISES. (3) (Prerequisite: MGCR 341) (BUSA 462 and BUSA 465 cannot both be taken for credit) Evaluation of new business ventures, recognition and treatment of associated risks. Detailed consideration is given to sources of risk funds in the form of venture capital, public, private and government programs. Emphasis on the critical importance of the entrepreneur, the demands and the risks faced as well as the rewards and satisfactions.

BUSA 464 MANAGEMENT OF SMALL ENTERPRISES. (3) (Prerequisite: MGCR 341) The distinctive characteristics, risks, opportunities and rewards inherent in the ownership and management of a small enterprise. It will assist students in judging the appropriateness of an entrepreneurial career and in selecting and timing a specific venture.

BUSA 465 TECHNOLOGICAL ENTREPRENEURSHIP. (3) (Prerequisite: MIME 310 or MGCR 341) (BUSA 462 and BUSA 465 cannot both be taken for credit) Concentrating on entrepreneurship and enterprise development, particular attention is given to the start-up, purchasing and management of small to medium-sized industrial firms in an environment that would appeal to Engineering students. The focal point is in understanding the dilemmas faced by entrepreneurs, resolving them, developing a business plan and the maximum utilization of the financial, marketing and human resources that make for a successful operation.

BUSA 481 NORTH AMERICA: GLOBAL MARKETS. (3) (U2 and U3 students. Prerequisite: MGCR 382 or permission of instructor) (Formerly MGMT 481) Analysis of corporate strategies in the Canada-United States context. Emphasis on public policy impact of corporate decision-making and implications of alternative public policy options. Bilateral experience by major industrial sectors examined and compared with global corporate strategies. Theoretical and empirical literature combined with industrial histories and policy case studies.

● **BUSA 493 GLOBAL ECONOMIC COMPETITIVENESS.** (3) (Prerequisite: MGCR 382.)

BUSA 499 CASE ANALYSIS AND PRESENTATION. (3) (Prerequisite: B.Com. Core and 3.0 CGPA or better) Integration of core knowledge and practice for preparing and presenting case studies, including professor coaching, preparation and presentation feedback, presentation skills, leadership skills, team building skills, analytical skills, logical thinking, debating, persuasive communications and cross discipline work.

FINE – Finance

Offered by: Management

Former Teaching Unit Code: 274

FINE 342 FINANCE 2. (3) (For Finance Concentration/Major/Honours) (Prerequisites: MGCR 341 and MGCR 272) (Only one of FINE 342 or FINE 343 can be counted for credit) A second course in Finance for students pursuing the Finance Concentration. In depth study of corporate finance, risk, diversification, portfolio analysis, and capital market theory.

FINE 343 MANAGERIAL FINANCE. (3) (For non-Finance students) (Prerequisite: MGCR 341) (Only one of FINE 342 or FINE 343 can be counted for credit) A second course in Finance for students not pursuing the Finance Concentration. Topics include short and long term asset and liability management, risk and diversification, and the nature of capital markets. Cases, lectures, projects and discussions.

FINE 434 TOPICS IN FINANCE. (3) Topics will be selected from current issues in the Finance Area.

FINE 441 INVESTMENTS AND PORTFOLIO MANAGEMENT. (3) (Prerequisite: FINE 342) Application of investment principles and security analysis to the selection and comparison of equity and fixed income securities in the current economic and financial environment. Also covered are: determinants of stock prices, growth models and portfolio diversification.

FINE 442 CAPITAL MARKETS AND INSTITUTIONS. (3) (Prerequisite: MGCR 341) (Only one of FINE 442 or ECON 302 can be counted for credit.) Functions of the capital market through flow of funds analysis and an examination of portfolio activities of financial intermediaries. Also covered are: securities regulations and ethical considerations, the term structure of interest rates and risk and rates of return in debt and equity markets.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

FINE 443 APPLIED CORPORATE FINANCE. (3) (Prerequisite: FINE 342) Concepts and techniques are applied to problems faced by managers in Corporate Finance, such as working capital management, capital budgeting, capital structure, dividend policy, cost of capital, and mergers and acquisition. Application of theory and techniques through case studies.

FINE 444 RISK MANAGEMENT AND INSURANCE. (3) (Prerequisite: MGCR 341) Risk exposures of the individual and the firm. A wide variety of techniques for reducing risk exposure are studied including Life, Property and Casualty Insurance. In addition, the course treats the problems faced by insurers such as re-insurance and investment policy.

FINE 445 REAL ESTATE FINANCE. (3) (Prerequisite: MGCR 341) Fundamentals of mortgages from the viewpoint of both consumer and the firm. Emphasis on legal, mathematical and financial structure, provides a micro basis for analysis of the functions and performance of the mortgage market, in conjunction with the housing market. A weekly series of one-hour tutorials are mandatory for the first six weeks of class.

● **FINE 446 REAL ESTATE INVESTMENT ANALYSIS.** (3) (For non-Finance Concentration) (Prerequisite: FINE 445)

● **FINE 447 REAL ESTATE VALUATION.** (3) (For non-Finance Concentration) (Prerequisite: FINE 445)

FINE 448 DERIVATIVES AND RISK MANAGEMENT. (3) (Prerequisites: FINE 342 and FINE 441 or consent of instructor) The course will concentrate on both the analytical and practical aspects of investments in options and futures. The first part of the course concentrates on option and futures valuation, considering both discrete and continuous time models. The second part of the course concentrates on the practical aspects of options and futures trading.

FINE 449 IMPLEMENTING DERIVATIVE MODELS. (3) (Prerequisite: FINE 448) Latest techniques for implementing the option pricing models used by leading investment banks, the binomial method, the trinomial method, finite difference methods, Monte Carlo simulation, and the use of implied trees for exotic options.

FINE 451 FIXED INCOME ANALYSIS. (3) (Prerequisites: FINE 441.) Fixed income financial instruments and their uses for both financial engineering and risk management (at the trading desk and aggregate firm level). This will involve coverage of fixed income mathematics, risk management concepts, term structure modeling, derivatives valuation and credit risk analysis.

● **FINE 478 INTERNATIONAL FINANCIAL MANAGEMENT.** (3) (Prerequisite: MGCR 341, MGCR 382.)

FINE 480 GLOBAL INVESTMENTS. (3) (Prerequisite: FINE 441, FINE 482, or consent of instructor) (Formerly MGMT 480) The theoretical foundations of international investments theory and empirical evidence in a real world setting. This course will focus on portfolio investment decisions of investment banks. It will span the Developed Markets (DMs) of Europe and Japan, Newly Industrialized Nations (NICs) of the Pacific rim, Emerging Markets (EMs) of Asia, Latin America, Eastern Europe and Africa.

FINE 482 INTERNATIONAL FINANCE 1. (3) (Prerequisite: FINE 342) (Formerly MGMT 482) The international financial environment as it affects the multinational manager. Balance of payments concepts, adjustment process of the external imbalances and the international monetary system. In depth study of the institutional and theoretical aspects of foreign exchange markets; International capital markets, including Eurobonds and eurocredit markets.

FINE 492 INTERNATIONAL FINANCE 2. (3) (Prerequisite: FINE 482) (Formerly MGMT 492) Focus on the operational problems of financial management in the multinational enterprise: Financing of international trade, international capital budgeting, multinational cost of capital, working capital management; International banking and recent developments in international capital markets.

● **FINE 541 APPLIED INVESTMENTS.** (3) (Prerequisite: FINE 441, U3 students only)

FINE 541D1 APPLIED INVESTMENTS. (1.5) (Prerequisite: FINE 441, U3 students only) (Students must also register for FINE 541D2) (No

credit will be given for this course unless both FINE 541D1 and FINE 541D2 are successfully completed in consecutive terms) (FINE 541D1 and FINE 541D2 together are equivalent to FINE 541) Students are exposed to practical aspects of managing investment portfolios. A principal activity of students is participation in the management of a substantial investment fund.

FINE 541D2 APPLIED INVESTMENTS. (1.5) (Prerequisite: FINE 541D1) (No credit will be given for this course unless both FINE 541D1 and FINE 541D2 are successfully completed in consecutive terms) (FINE 541D1 and FINE 541D2 together are equivalent to FINE 541) See FINE 541D1 for course description.

● **FINE 546 LAND LAW.** (3) (Prerequisite: BUSA 364 or equivalent)

FINE 647 ADVANCED FINANCE SEMINAR. (3) (Prerequisite: FINE 441 and FINE 443, or FINE 646) (Lectures for this course span both the fall and winter semesters) Selected topics will be discussed by Faculty members, invited guest speakers, and the students. Each student is required to select a topic for study and prepare a written report for presentation.

INDR – Industrial Relations

Offered by: Management

Former Teaching Unit Code: 279

INDR 294 INTRODUCTION TO LABOUR-MANAGEMENT RELATIONS. (3) An introduction to labour-management relations, the structure, function and government of labour unions, labour legislation, the collective bargaining process, and the public interest in industrial relations.

● **INDR 434 TOPICS: LABOUR MANAGEMENT RELATIONS.** (3) (Prerequisite: INDR 294)

INDR 449 OCCUPATIONAL HEALTH AND SAFETY. (3) (Prerequisite: INDR 294) Examines the public policy of occupational health and safety in Canada as well as the dynamics of contemporary occupational health and safety management. Topics include occupational safety and health, human rights and workers' compensation legislation, accident prevention and investigation, ergonomics, safety training, and workers' compensation claims management.

INDR 459 INTERNATIONAL LABOUR RELATIONS. (3) (Prerequisite: INDR 294) Examines industrial relations systems of other nations, including those of the EEC and the Pacific rim. Includes a discussion of the existing institutional structure, the historical and recent developments in these systems, the role of multi-national corporations, as well as the current economic and political context.

INDR 492 PUBLIC POLICY IN INDUSTRIAL RELATIONS. (3) (Prerequisite: INDR 294) Development and structure of legislative framework governing labour-management relations. Court cases, arbitration precedents, labour relations board activities, and public attitudes; the formation of a public policy for labour relations. Major issues in shaping labour policy, and the linkages between policy and experience in labour management relations. The federal and Quebec jurisdictions.

INDR 494 LABOUR LAW. (3) (Prerequisite: INDR 294) (Management: Open to Labour-Management Relations Major students in U3) Introduction to the basic concepts of labour law relevant to the practice of industrial relations. Historical development of labour law in certain social and legal systems and the culmination in the legislative enactments and jurisprudence of Canadian jurisdictions and certain comparative foreign models.

INDR 495 LABOUR RELATIONS: PUBLIC SECTOR. (3) (Prerequisite: INDR 294) Labour relations in federal, provincial, municipal, and quasi-public services such as hospitals, schools, government agencies and boards. Contentious current issues in public service labour relations and compare and analyze the alternative methods that have been evolved to deal with them.

INDR 496 COLLECTIVE BARGAINING. (3) (Prerequisite: INDR 294) Principles of collective bargaining in Canada and abroad. Problem oriented. Mock collective bargaining sessions provide an opportunity for students to apply knowledge gained.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

INSY 497 CONTRACT ADMINISTRATION. (3) (Prerequisite: INDR 294) The processes of grievance handling and arbitration under the terms of collective bargaining agreements. Substantive and procedural issues as well as behavioral and policy aspects of contract administration.

INSY – Information Systems

Offered by: Management
Former Teaching Unit Code: 273

INSY 332 ACCOUNTING INFORMATION SYSTEMS. (3) (Prerequisites: MGCR 331 and MGCR 211) Accounting cycles and information flows and the systems that manage those flows. Principals of systems development and data management as relates to accounting information. Relationship between accounting applications and transaction processing systems. Practical experience with accounting packages.

INSY 333 SYSTEMS ANALYSIS AND MODELLING. (3) (Prerequisite: MGCR 331) Techniques for conducting systems requirements analysis and project management using structured analysis for specifying both manual and automated systems. Focuses on the role of the analyst in investigating the current organizational environment, defining information system requirements, working with technical and non-technical staff, and making recommendations for system improvement. Analysis Project.

● **INSY 334 BUSINESS PROGRAMMING DEVELOPMENT.** (3) (Prerequisite: INSY 342)

INSY 341 BUSINESS SYSTEMS DESIGN I. (3) (Prerequisite: MGCR 331) Principals of business systems design applied to a procedural language development environment. Emphasis on modularization and maintainability. Introduction to standard program structures including control, repetition, arrays, procedures and functions, and parameter passing. Hands on projects using a high level procedural language.

INSY 342 BUSINESS SYSTEMS DESIGN 2. (3) (Prerequisite: INSY 341) Continuation of 273-341. Emphasis on data structures and file design and management in business applications.

INSY 422 OBJECT ORIENTED DESIGN. (3) (Prerequisite: INSY 342) (Not open to students having taken COMP 202, COMP 203) Principals of the object oriented paradigm. Object technology, data management, and design principals related to business application development.

INSY 431 INFORMATION SYSTEMS DESIGN. (3) (Prerequisites: INSY 333, INSY 437, and INSY 342) Principles of business systems design, organization structure, software design and systems theory. Information system modelling techniques. Inter-organizational systems. Use of Computer Assisted Software Engineering tools. Design Project.

INSY 432 INFORMATION SYSTEMS ADMINISTRATION. (3) (Prerequisites: INSY 333 and INSY 437) This course covers the issues relating to managing information systems resources. A combination of lecture and case discussions covers topics such as the role of the Information Systems department within the corporation, staff organization and leadership, strategic systems, planning, end user computing, change management, and other areas of importance to information systems managers.

INSY 434 ADVANCED TOPICS. (3) (Prerequisite: MGCR 331) Topics covered will depend upon the lecturer. In the past subjects have included logic programming, expert systems, and Decision Support Systems.

INSY 436 TELECOMMUNICATIONS MANAGEMENT. (3) (Prerequisites: MGCR 331 and INSY 333) This course addresses the challenges and issues managers face in delivering telecommunications and data networking services to their organizations. Using case studies and lectures, it explores technical and managerial aspects of data communications; local, wide-area and wireless networks; network protocols; Internet/intranets; client/server computing; network security and management.

INSY 437 DATA AND DATABASE MANAGEMENT. (3) (Prerequisite: INSY 333) (Management: students are encouraged to take this course as early as possible in their program.) Focus on the management of organizational data and database management systems. Practice in database design. Examination of different models of representing data with emphasis on the relational model. Practice in simple and complex queries with emphasis on SQL. Overview of implementation issues, distributed database systems, and roles and responsibilities of data management personnel.

INSY 438 GRAPHICAL DEVELOPMENT ENVIRONMENTS. (3) (Prerequisite: INSY 341. Corequisite: INSY 342) An in depth study of practical and theoretical design and development principles in an event driven development environment. Comparative analysis with other models of system design and generation.

INSY 440 FUNDAMENTALS OF E-COMMERCE. (3) (Prerequisite: MGCR 331) Information systems concepts, models, tools and applications related to E-commerce.

● **INSY 444 DECISION SUPPORT SYSTEMS.** (3) (Prerequisites: INSY 333 and INSY 437)

INSY 533 INFORMATION SYSTEMS AUDITING AND SECURITY. (3) (Prerequisite: INSY 332 or CCCS 300) This course considers problems and methods of establishing effective controls of computer systems at an advanced level. The student will learn how to review, and evaluate controls in a computer environment through the use of case studies. The student will also learn how to use computer assisted audit techniques to test computer controls.

MGCR – Management Core

Offered by: Management
Former Teaching Unit Code: 280

MGCR 211 INTRODUCTION TO FINANCIAL ACCOUNTING. (3) The role of financial accounting in the reporting of the financial performance of a business. The principles, components and uses of financial accounting and reporting from a user's perspective, including the recording of accounting transactions and events, the examination of the elements of financial statements, the preparation of financial statements and the analysis of financial results.

MGCR 213 INTRODUCTION TO MANAGEMENT ACCOUNTING. (3) (Prerequisite: MGCR 211) (Formerly ACCT 213) An introduction to the role of management accounting information in manufacturing, service and not-for-profit organizations. The focus is on the activities performed to create value for customers. The course blends contemporary theory with practical applications to illustrate the demand for management accounting information in implementing organizational strategy.

MGCR 222 INTRODUCTION TO ORGANIZATIONAL BEHAVIOUR. (3) Individual motivation and communication style; group dynamics as related to problem solving and decision making, leadership style, work structuring and the larger environment. Interdependence of individual, group and organization task and structure.

MGCR 271 STATISTICS 1. (3) (Prerequisite: MATH 131 or equivalent) (Not open to students who have taken or are taking MATH 323, PSYC 204, ECON 227, ECON 257) Statistical concepts and methodology, their application to management problems. Topics include: descriptive statistics; probability theory, random variables, important discrete and continuous probability distributions, sampling and sampling distributions, interval estimation and index numbers.

MGCR 272 STATISTICS 2. (3) (Prerequisite: MGCR 271) (Not open to students who have taken or are taking MATH 324, PSYC 307, ECON 227, ECON 257) Hypothesis testing and estimation, sampling procedures, nonparametric procedures, goodness-of-fit tests, analysis of variance, simple and multiple regression analysis, time series.

MGCR 293 MANAGERIAL ECONOMICS. (3) (Formerly 280-393) The course focuses on the application of economic theory to management problems and the economic foundations of marketing,

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

finance, and production. Attention is given to the following topics: price and cost analysis; demand and supply analysis, conditions of competition.

MGCR 320 MANAGING HUMAN RESOURCES. (3) (Prerequisite: for B.Com. students only, MGCR 222) Human resource systems are examined from a strategic business perspective and in an overall global context, with a focus on the role of the line manager. Topics covered include: staffing, training and development, performance management, reward systems, employee relations, high performance work systems, diversity, work/life issues.

MGCR 331 INFORMATION SYSTEMS. (3) (Fall sections restricted to B.Com. students) Introduction to principles and concepts of information systems in organizations. Topics include information technology, transaction processing systems, decision support systems, database and systems development. Students are required to have background preparation on basic micro computer skills including spreadsheet and word-processing.

MGCR 341 FINANCE 1. (3) (Prerequisites: MGCR 271, MGCR 211 and MGCR 293) An introduction to the principles, issues, and institutions of Finance. Topics include valuation, risk, capital investment, financial structure, cost of capital, working capital management, financial markets, and securities.

MGCR 352 MARKETING MANAGEMENT 1. (3) Introduction to marketing principles, focusing on problem solving and decision making. Topics include: the marketing concept; marketing strategies; buyer behavior; Canadian demographics; internal and external constraints; product; promotion; distribution; price. Lectures, text material and case studies.

MGCR 360 SOCIAL CONTEXT OF BUSINESS. (3) This course examines how business interacts with the larger society. It explores the development of modern capitalist society, and the dilemmas that organizations face in acting in a socially responsible manner. Students will examine these issues with reference to sustainable development, business ethics, globalization and developing countries, and political activity.

MGCR 373 OPERATIONS RESEARCH 1. (3) (Prerequisite: MGCR 271) Topics include: introduction to decision analysis and risk attitudes, inventory control, linear programming and simulation. Emphasis on the formulation of problems and their solution by standard methods or by computer packages.

MGCR 382 INTERNATIONAL BUSINESS. (3) (Formerly MGMT 382) An introduction to the world of international business. Economic foundations of international trade and investment. The international trade, finance, and regulatory frameworks. Relations between international companies and nation-states, including costs and benefits of foreign investment and alternative controls and responses. Effects of local environmental characteristics on the operations of multi-national enterprises.

MGCR 423 ORGANIZATIONAL POLICY. (3) (Open to U3 students only) (Formerly 280-323) Focus on the primary functions of general management: the formation of a corporate strategy that relates the company's opportunities to its resources, competence, and leadership style. Measures to improve organization effectiveness.

MGCR 472 OPERATIONS MANAGEMENT. (3) (Prerequisite: MGCR 271 or equivalent. Corequisite: MGCR 373) Introduction to decisions and trade-offs associated with production of goods and services. Topics include technology planning (production process), control issues (production planning and inventory control, MRP/JIT, scheduling, quality and reliability and distribution planning), design for manufacturability, management of new technology (FMS, group technology and robotics) and management of service operations.

MGPO – Management Policy

Offered by: Management

Former Teaching Unit Code: 276

MGPO 383 INTERNATIONAL BUSINESS POLICY. (3) (Prerequisites: MGCR 382 and MGCR 341 or permission of instructor) (Formerly 278-383) Development and application of conceptual approaches to general management policy and strategy formulation in multinational business involvement (exporting, licensing, contractual arrangements, turnkey projects, joint ventures, consortia); technology transfer, location and ownership strategies; competitive multinational relationships. Emphasis on pragmatic analysis, using case studies.

MGPO 434 TOPICS IN POLICY. (3) This is a specialized course covering an advanced topic in strategy and organization.

MGPO 440 STRATEGIES FOR SUSTAINABILITY. (3) This course explores the relationship between economic activity, management, and the natural environment. Using readings, discussions and cases, the course will explore the challenges that the goal of sustainable development poses for our existing notions of economic goals, production and consumption practices and the management of organizations.

MGPO 450 ETHICS IN MANAGEMENT. (3) (U2 and U3 students only) An examination of the economic, legal and ethical responsibilities of managers in both private and public organizations. Through readings, case studies, discussions and projects the class evaluates alternative ethical systems and norms of behaviour and draws conclusions as to the right, proper and just decisions and actions in the face of moral dilemmas. The focus of this course is on the decision process, values and consistency of values of the individual and on the impact of systems control and incentives on managerial morality.

MGPO 460 MANAGING INNOVATION. (3) Firms face difficulties in developing new products. This course examines the new product development process to understand why problems occur and what managers can do. Topics include the creative synthesis of market and technology; the coordination of functions; and the strategic connection between the project and the strategy.

MGPO 468 MANAGING ORGANIZATIONAL POLITICS. (3) Power and politics can be mechanisms of control that maintain the status quo or they can be used as a force for change. Students learn how to recognize politics and use power. There is also a strong focus on the ethical implications.

MGPO 469 MANAGING GLOBALIZATION. (3) (Recommended: MGCR 423) This course exposes students to global competition. Many critical questions will be explored, such as: why do industries globalize? how do firms expand and grow internationally? what are strategies that firms can use to compete internationally? Many industries will be covered, such as: telecommunications, airlines, footwear, and automobiles.

MGPO 470 STRATEGY AND ORGANIZATION. (3) This course explores how strategic change affects the organization and how the organization can be designed to realize its strategy more effectively. It will examine how strategic choices affect organizational structures, processes, culture, human resource policies, leadership styles, etc. and how the organization can be aligned with the organizational mission.

● **MGPO 562 SEMINAR IN ORGANIZATIONAL STRATEGY.** (3) (U3 standing or permission of the instructor)

MGPO 567 BUSINESS IN SOCIETY. (3) (U2 and U3 students only) Examines different ideologies; business ethics and values; the corporation and its constituencies; the social impact of corporate decisions. The focus of this course is on the interaction between business organizations and society and on incorporating social impact analysis into strategic management.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MGSC – Management Science

Offered by: Management
Former Teaching Unit Code: 277

● **MGSC 601 MANAGEMENT OF TECHNOLOGY IN MANUFACTURING.** (3)

● **MGSC 602 MANUFACTURING STRATEGY.** (3)

MGSC 603 LOGISTICS MANAGEMENT. (3) (Prerequisite: MGCR 472) The management of the logistics functions in a manufacturing firm. Internal logistics includes the design and operation of a production-distribution system, with emphasis on the management of supply chains in global manufacturing companies. External logistics includes an analysis of the prevailing sourcing strategies and alternative means of customer satisfaction. Important tools such as forecasting techniques and information technology are also covered.

MGSC 605 TOTAL QUALITY MANAGEMENT. (3) (Prerequisite: MGCR 272 or MGCR 274) The topics include: Top Management Commitment, Leadership Style, Bench Marking, Employee Involvement, Human Resource Utilization, Employee Motivation, Quality Function Deployment, Statistical Techniques for Quality Improvement including the seven tools of quality and statistical process control. New topics of ISO9000, Just-in-Time, "Kaizen" and Return-of Quality are also discussed. Students are encouraged to do industry projects on TQM.

MGSC 608 DATA DECISIONS AND MODELS. (3) The goal is to evaluate quantitative information and to make sound decisions in complex situations. The course provides a foundation for various models of uncertainty, techniques for interpreting data and many decision making approaches in both deterministic and stochastic environments.

MGSC 615 THE INTERNET AND MANUFACTURING. (3) Emergent concepts in the field of electronic commerce.

MGSC 631 ANALYSIS: PRODUCTION OPERATIONS. (3) (Prerequisite: MGCR 472) This course presents a framework for design and control of modern production and inventory systems, and bridges the gap between theory and practice of production and inventory management. The course develops analytical concepts in the area and highlights their applications in manufacturing industry. The course is divided into three segments. The first segment looks at the production planning process and discusses in detail the resource allocation issues. The second segment deals with analysis and operation of inventory systems. The third segment integrates production planning and inventory control and looks at various integrated models for determining replenishment quantities and production lots.

● **MGSC 632 SAMPLE SURVEY METHODS AND ANALYSIS.** (3) (Prerequisite: MGCR 272 or MGCR 274)

● **MGSC 671 STATISTICS FOR BUSINESS DECISIONS.** (3) (Prerequisite: MGCR 272 or MGCR 274)

● **MGSC 675 APPLIED TIME SERIES ANALYSIS MANAGERIAL FORECASTING.** (3) (Prerequisite: MGCR 272 or MGCR 274)

● **MGSC 676 APPLIED MULTIVARIATE DATA ANALYSIS.** (3) (Prerequisite: MGCR 272 or MGCR 274)

● **MGSC 678 SIMULATION OF MANAGEMENT SYSTEMS.** (3) (Prerequisites: MGCR 272, MGCR 373)

MGSC 679 APPLIED DETERMINISTIC OPTIMIZATION. (3) (Prerequisite: MGCR 373) Methodological topics include linear, nonlinear and integer programming. Emphasis on modelling discrete or continuous decision problems that arise in business or industry, using the modern software tools of algebraic modelling (GAMS) that let the user concentrate on the model and on its implementation rather than on solution techniques. Management cases involving energy systems, production and inventory scheduling, logistics and portfolio selection, will be used extensively.

MGSC 690 TOPICS IN MANAGEMENT SCIENCE. (3)

MRKT – Marketing

Offered by: Management
Former Teaching Unit Code: 275

● **MRKT 351 MARKETING AND SOCIETY.** (3) (Prerequisite: MGCR 352)

MRKT 354 MARKETING MANAGEMENT 2. (3) (Prerequisite: MGCR 352) The decision areas in marketing. Emphasis on the use of marketing theory and concepts in the solution of realistic marketing problems. Decision making in a marketing context using cases, some of which will be computer assisted, and readings.

MRKT 355 SERVICES MARKETING. (3) (Prerequisite: MGCR 352) Services are fleeting and involve direct contact between the supplier and the buyer. Inventories disappear every time an aircraft takes off or the night passes for an hotel. Yet services have become the largest sector in modern Western economy and their importance shows every sign of continuing to grow. This course focuses on the key differences between product and services marketing and the skills that are necessary for the services sector.

MRKT 357 MARKETING PLANNING 1. (3) (Prerequisites: MRKT 354, MRKT 451, and MRKT 452) (Management: U3 students only) Marketing Planning is designed as a capstone to previous marketing courses; Structured approach to developing a marketing plan, proceeding from corporate mission and objectives through to detailed marketing mix programs. Lectures, discussions and cases. A field project provides marketing planning experience.

MRKT 360 MARKETING OF TECHNOLOGY. (3) (Restricted to non-Management students) The analysis, planning, and control of marketing activities in a high technology business environment through the application of a good conceptual framework that is useful in addressing marketing management problems.

MRKT 365 NEW PRODUCTS. (3) (Prerequisite: MGCR 352) New products will follow the new product introduction process from idea generation to post introduction. It will use ideas developed in marketing, production and policy. It will use cases and projects and will involve a real life new product project. In the average firm today, 40% of sales come from products not being sold five years ago. The ability of the firm to innovate is at the heart of long term success.

● **MRKT 434 TOPICS IN MARKETING.** (3) (Prerequisite: MGCR 352. Corequisite: MGCR 272 or equivalent)

MRKT 438 BRAND MANAGEMENT. (3) (Prerequisite: MGCR 352) Looks at the decisions a brand manager in a major consumer goods company takes. It examines, in particular, the breakdown of advertising and sales promotion expenditures. It looks at the short term nature of the decisions taken. It will concentrate on the vast amount of new information available to brand managers today, especially in the form of scanner data.

MRKT 451 MARKETING RESEARCH. (3) (Prerequisite: MGCR 352. Corequisite: MGCR 272) Theoretical techniques and procedures common in marketing research. Topics include: research design, sampling, questionnaire design, coding, tabulating, data analysis (including statistical techniques). Specialized topics may encompass advertising, motivation and product research; forecasting and location theory.

MRKT 452 CONSUMER BEHAVIOUR. (3) (Prerequisite: MGCR 352) A study of basic factors influencing consumer behaviour. Attention is focused on psychological, sociological and economic variables including motivation, learning, attitude, personality, small groups, social class, demographic factors and culture, to analyze their effects on purchasing behaviour.

MRKT 453 ADVERTISING MANAGEMENT. (3) (Prerequisite: MRKT 452) Surveys advertising and promotion in Canadian context. Examines activities as they relate to advertisers, the advertising agency and media. Stresses advertising by objectives as the approach to developing strategy and tactics. Real examples from current campaigns are the focal point of class discussions.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MRKT 455 SALES MANAGEMENT. (3) (Prerequisite: MGCR 352) Responsibilities of the sales manager as they relate to the sales force. These include the selection of process, training alternatives, compensation and incentive plans, supervision and evaluation and budgeting and forecasting. Case studies and discussions of sales force models are used.

MRKT 456 INDUSTRIAL MARKETING. (3) (Prerequisite: MGCR 352) Decision-making and management of the marketing effort in an industrial product context. Topics include the industrial marketing system; industrial purchasing; researching the industrial market; product, price distribution, selling and advertising decisions; strategies for industrial markets. Lectures and case discussions are used.

● **MRKT 459 RETAIL MANAGEMENT.** (3) (Prerequisite: MGCR 352)

● **MRKT 461 ADVERTISING PRACTICUM.** (3) (Corequisite: MRKT 453)

MRKT 483 INTERNATIONAL MARKETING MANAGEMENT. (3) (Prerequisites: MGCR 382 and MGCR 352, or permission of instructor) (Formerly MGMT 483) Marketing management considerations of a company seeking to extend beyond its domestic market. Required changes in product, pricing, channel, and communications policies. Attention to international trade and export marketing in the Canadian context.

● **MRKT 557 MARKETING RESEARCH 2.** (3) (Prerequisite: MRKT 451)

ORGB – Organizational Behaviour

Offered by: Management

Former Teaching Unit Code: 272

ORGB 321 LEADERSHIP. (3) (Prerequisite: for B.Com. students only, MGCR 222) Leadership theories and provides students with opportunities to assess and work on improving their leadership skills. Topics include: the ability to know oneself as a leader, to formulate a vision, to have the courage to lead, to lead creatively, and to lead effectively with others.

ORGB 380 CROSS CULTURAL MANAGEMENT. (3) (Formerly MGMT 380) Cross-cultural awareness and communication skills necessary to manage in multicultural organizations. Focus on the relationship between cultural values and communication style as they affect inter and intra cultural communication of managers, personnel and clients of multinational and multicultural organizations.

ORGB 420 MANAGING ORGANIZATIONAL TEAMS. (3) (Prerequisite: MGCR 222 or permission of Instructor) (Continuing Education: requirement for I.C.B.) Theory, research, and applications Principles of team processes and effectiveness in organizational settings, specifically the theoretical developments and empirical findings of group dynamics and team effectiveness, and practical strategies and skills for successful management of organizational teams.

ORGB 421 MANAGING ORGANIZATIONAL CHANGE. (3) (Prerequisite: MGCR 222 or permission of Instructor) (Continuing Education: this course cannot be taken for credit if ORGB 522 was already completed) Organizational change theory and techniques are examined with an emphasis on techno-structural interventions such as Quality-of-Work-Life approaches. Through simulations and case-studies, the course explores initiatives in organizational change, primarily in contemporary Canadian organizations. It also includes opportunities for "hands-on" experience in work and organization redesign.

ORGB 423 HUMAN RESOURCES MANAGEMENT. (3) (Prerequisite: MGCR 222) Issues involved in personnel administration. Topics include: human resource planning, job analysis, recruitment and selection, training and development, performance appraisal, organization development and change, issues in compensation and benefits, and labour-management relations.

ORGB 429D1 ORGANIZATIONAL BEHAVIOUR FOR COURSE COUNSELLORS. (3) (Prerequisite: MGCR 222) (Students must also register for ORGB 429D2) (No credit will be given for this course unless both ORGB 429D1 and ORGB 429D2 are successfully completed in consecutive terms) Examination of behaviour in organizations, coupled with training in teaching methods, to prepare students to team teach a section of MGCR 222. Selection of course counsellors is made toward the end of the preceding winter term. Only students thus selected will be permitted to register for this course.

ORGB 429D2 ORGANIZATIONAL BEHAVIOUR FOR COURSE COUNSELLORS. (3) (Prerequisite: ORGB 429D1) (No credit will be given for this course unless both ORGB 429D1 and ORGB 429D2 are successfully completed in consecutive terms) See ORGB 429D1 for course description.

ORGB 434 ADVANCED TOPICS IN ORGANIZATIONAL BEHAVIOUR. (3) (Prerequisite: MGCR 222) This is an advanced course for students with a special interest in Organizational Behaviour. Topics will be selected from current issues or themes in literature.

ORGB 435 WOMEN AS GLOBAL LEADERS AND MANAGERS. (3) (Prerequisite: MGCR 222) Women are assuming leadership roles in many fields heretofore almost exclusively led by men. Yet even in the 1990s, less than 5% of international managers are women and less than 3% of international business cases portray women in leadership roles. This seminar will review the major trends affecting women's power and influence in society in general and in organizations in particular. Participants will develop the vision, skills, and competencies needed for global leadership.

ORGB 525 COMPENSATION MANAGEMENT. (3) (Prerequisite: MGCR 320) Compensation policies and practices, consistent with motivational theories, are examined. Topics include: design and evaluation of job evaluation systems, salary structures, and performance-based pay; compensation of special employee groups; and current pay equity laws. Projects and simulations provide "hands-on" experience in the use of compensation techniques.

Faculty of Music

MUCO – Composition

Offered by: Department of Theory

Former Teaching Unit Code: 213

MUCO 240D1 TONAL COMPOSITION. (3) (3 hours) (Prerequisites: MUTH 110 and MUTH 111 OR their equivalent. Corequisites: MUSP 229 and MUSP 231 AND MUSP 170 and MUSP 171. Open only to students in Composition) (Students must also register for MUCO 240D2) (No credit will be given for this course unless both MUCO 240D1 and MUCO 240D2 are successfully completed in consecutive terms) A writing course based on the stylistic concepts and resources of European music - 1770-1850 - and designed to develop control of factors such as phrase structure, melodic shape,

rhythm, linear continuity, economy of means, notation, and basic contrapuntal procedures. Extensive and detailed analysis of characteristic forms.

MUCO 240D2 TONAL COMPOSITION. (3) (Prerequisite: MUCO 240D1) (No credit will be given for this course unless both MUCO 240D1 and MUCO 240D2 are successfully completed in consecutive terms) See MUCO 240D1 for course description.

MUCO 245D1 COMPOSITION. (2) (2 hours) (Prerequisites: MUTH 110 and MUTH 111. Corequisites: MUSP 229 and MUSP 231 AND MUSP 170 and MUSP 171. Open only to students in Composition) (Students must also register for MUCO 245D2) (No credit will be given for this course unless both MUCO 245D1 and MUCO 245D2 are successfully completed in consecutive terms) 20th Century techniques and approaches. Basic dimensions such as pitch,

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

rhythm and timbre, and their inter-relationship at all structural levels. Notation and score preparation. Performance practice. Analysis of selected 20th Century scores. Writing of short pieces for solo instruments and small ensembles, including voice.

MUCO 245D2 COMPOSITION. (2) (Prerequisite: MUCO 245D1) (No credit will be given for this course unless both MUCO 245D1 and MUCO 245D2 are successfully completed in consecutive terms) See MUCO 245D1 for course description.

MUCO 260 INSTRUMENTS OF THE ORCHESTRA. (2) (2 hours) (Prerequisite: MUTH 111 or equivalent) An introductory study of the instruments of string, woodwind and brass families, elementary acoustics of the instruments. Techniques of playing including embouchure, fingering, bowing, hand-stopping, transposing instruments. Evolution of the instruments, their technique and their music from the 18th century to the present.

MUCO 261 ELEMENTARY ORCHESTRATION. (2) (2 hours) (Prerequisite: MUCO 260) Study of traditional orchestration through analysis. Transcription of piano works for small ensembles (string quartet, woodwind quintet, brass quintet). Reduction of orchestral scores for piano.

MUCO 340D1 COMPOSITION. (3) (2 hours) (Prerequisites: MUCO 240 AND MUCO 245 with "B" standing in each. Corequisites: MUSP 329 and MUSP 331) (Students must also register for MUCO 340D2) (No credit will be given for this course unless both MUCO 340D1 and MUCO 340D2 are successfully completed in consecutive terms) Free composition.

MUCO 340D2 COMPOSITION. (3) (Prerequisite: MUCO 340D1) (No credit will be given for this course unless both MUCO 340D1 and MUCO 340D2 are successfully completed in consecutive terms) See MUCO 340D1 for course description.

☐ **MUCO 341 DIGITAL STUDIO COMPOSITION 1.** (3) (3 hours lecture-demonstration and 3 hours studio time) (Prerequisites: MUMT 202. MUMT 203 is highly recommended) Composition with MIDI, audio recording, digital audio signal processing software and hardware. Creation of small-scale composition studies using technological resources in the context of electroacoustic music. The hands-on activities will include critical listening and evaluation of electronic and computer music repertoire.

☐ **MUCO 342 DIGITAL STUDIO COMPOSITION 2.** (3) (3 hours lecture-demonstration and 3 hours studio time) (Prerequisite: MUCO 341) Advanced composition with MIDI, audio recording, digital audio signal processing software and hardware. Creation of complete electroacoustic pieces and/or production of audio media materials.

MUCO 440D1 COMPOSITION. (3) (2 hours) (Prerequisite: MUCO 340) (Students must also register for MUCO 440D2) (No credit will be given for this course unless both MUCO 440D1 and MUCO 440D2 are successfully completed in consecutive terms) Free composition.

MUCO 440D2 COMPOSITION. (3) (Prerequisite: MUCO 440D1) (No credit will be given for this course unless both MUCO 440D1 and MUCO 440D2 are successfully completed in consecutive terms) See MUCO 440D1 for course description.

● **MUCO 441 SPECIAL PROJECTS: COMPOSITION.** (6) (2 hours) (Prerequisite: MUCO 440)

MUCO 441D1 SPECIAL PROJECTS: COMPOSITION. (3) (Students must also register for MUCO 441D2) (No credit will be given for this course unless both MUCO 441D1 and MUCO 441D2 are successfully completed in consecutive terms) (MUCO 441D1 and MUCO 441D2 together are equivalent to MUCO 441)

MUCO 441D2 SPECIAL PROJECTS: COMPOSITION. (3) (Prerequisite: MUCO 441D1) (No credit will be given for this course unless both MUCO 441D1 and MUCO 441D2 are successfully completed in consecutive terms) (MUCO 441D1 and MUCO 441D2 together are equivalent to MUCO 441) See MUCO 441D1 for course description.

MUCO 460D1 ADVANCED ORCHESTRATION. (2) (2 hours) (Prerequisites: MUCO 240 and MUCO 261) (Students must also register for

MUCO 460D2) (No credit will be given for this course unless both MUCO 460D1 and MUCO 460D2 are successfully completed in consecutive terms) A short survey of the history of instrumentation and orchestration. Instrumentation/orchestration workshop, approximately twice per term, to test timbres, dynamics, idiomatic writings for, and combinations of, available instruments. Coordination with Electronic Music courses, e.g. with regard to live-electronics. Analysis of orchestration techniques used by composers.

MUCO 460D2 ADVANCED ORCHESTRATION. (2) (Prerequisite: MUCO 460D1) (No credit will be given for this course unless both MUCO 460D1 and MUCO 460D2 are successfully completed in consecutive terms) See MUCO 460D1 for course description.

MUCT – Choral Techniques

Offered by: Department of Theory
Former Teaching Unit Code: 221

Note: Preference will be given to Music Education students in all MUCT courses.

☐ **MUCT 235 VOCAL TECHNIQUES.** (3) (3 hours and 2 hours lab) (Corequisites: MUTH 110 or MUTH 111 AND MUSP 129 or MUSP 131 AND MUHL 184 or MUHL 185.) Development of basic singing skills through group voice lessons, lectures, and Choral Lab performances. Emphasis will be on: text production, breathing, projection, clarity of vowels and consonants, the International Phonetic Alphabet, and definition of voice categories. Simple diagnostic teaching skills will be developed through observation of group voice lessons.

☐ **MUCT 315 CHORAL CONDUCTING 1.** (3) (3 hours and 2 hours lab) (Prerequisites: MUTH 211, MUSP 229, MUCT 235 AND MUGT 215 or permission of instructor.) The fundamental skills of choral conducting, including baton technique, score reading, and rehearsal procedures. Conducting materials will be selected from representative choral works.

● ☐ **MUCT 335 ADVANCED VOCAL/CHORAL TECHNIQUES.** (3) (3 hours and 2 hours lab) (Prerequisite: MUCT 235.)

● ☐ **MUCT 415 CHORAL CONDUCTING 2.** (3) (3 hours and 2 hours lab) (Prerequisite: MUCT 315.)

MUEN – Ensemble

Offered by: Department of Performance
Former Teaching Unit Code: 243

Note: The deadline for withdrawing from ensembles is the end of the second week of classes.

MUEN 463 JAZZ VOCAL WORKSHOP. (2)

MUEN 468 ENSEMBLE. (1)

MUEN 470 JAZZ COMBO. (1) (1 hour) (Prerequisite: Audition. Open only to Jazz Performance Majors) A Jazz Improvisation Ensemble of approximately 4 to 9 players.

MUEN 472 CAPPELLA ANTICA. (2) (4 hours) (Prerequisite: Audition) An ensemble of 8 to 12 voices specializing in early music. N.B. This ensemble may substitute as a Basic Ensemble in programs that specify Choral Ensemble, with Departmental approval.

MUEN 473 COLLEGIUM MUSICUM. (2) (4 hours) (Prerequisites: Audition AND MUEN 480 AND a prerequisite or corequisite of MUPP 381. Additional prerequisite for keyboard players: MUPG 372 with a grade of A-) Open to singers and instrumentalists, this ensemble specializes in chamber music primarily of the Baroque era.

☐ **MUEN 479 SONG INTERPRETATION.** (1) (2 hours) (Prerequisite: Audition) Normally open only to Voice and Piano Performance students. Study of the standard song repertoire with emphasis on the singer and pianist as partners. A public recital will be given at the end of each term.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MUEN 480 EARLY MUSIC ENSEMBLE. (1) (Prerequisite: Audition. Prerequisite or corequisite for keyboard players: MUPG 272) An ensemble of 4-6 vocalists and instrumentalists which performs music of the Medieval, Renaissance and Baroque periods.

MUEN 481 PIANO ENSEMBLE. (1) (1 hour) (Prerequisite: Piano Concentration 1 Examination or Audition) Concentration on interpretation and performance of piano duet and two piano repertoire.

MUEN 483 PIANO ACCOMPANYING. (1) (2 hours) (Prerequisite: Audition) A limited number of qualified students will be accepted for intensive work in this field. Singers and other instrumentalists will be admitted.

MUEN 484 STUDIO ACCOMPANYING. (1) (4 hours) (Prerequisite: MUEN 483) Highly qualified accompanists will be assigned to work independently with studio teachers and their students.

MUEN 485 MIXED ENSEMBLES. (1) (1-2 hours) (Prerequisite: Audition)

MUEN 486 OPERA COACHING. (1) (3-6 hours) (Prerequisite: open to advanced pianists by audition and with the approval of Director of Opera Studies; may be repeated for credit) Supervised playing of Opera McGill scenes and productions; repetiteur and rehearsal pianist responsibilities; playing of performance of operatic scenes.

● **MUEN 487 CAPPELLA MCGILL.** (2) (4 hours) (Prerequisite: Audition) (May be taken instead of Choral Ensemble)

MUEN 488 ENSEMBLE. (1)

MUEN 489 WOODWIND ENSEMBLES. (1) (2-3 hours) (Prerequisite: audition)

MUEN 490 MCGILL WINDS. (2) (4-6 hours) (Prerequisite: audition)

MUEN 491 BRASS ENSEMBLES. (1) (2-3 hours) (Prerequisite: audition)

● **MUEN 492 CHAMBER JAZZ ENSEMBLE.** (2) (Open to Jazz Performance students only.)

MUEN 493 CHORAL ENSEMBLES. (2) (4 hours) (Prerequisite: audition) (Section 01 Chamber Singers: a group of approximately 24 mixed voices which explores the a capella repertoire of all periods as well as works with chamber accompaniment) (Section 02 Concert Choir: an ensemble of approximately 60 voices (S.A.T.B.) which performs the repertoire from all periods appropriate to a group of this size) (Section 03 University Chorus: a mixed chorus of approximately 100 which performs a variety of choral material including both traditional and popular selections) (Section 04 Women's Chorale: an ensemble of approximately 40 women stressing the fundamentals of singing and ensemble participation) Students enrolling in Choral Ensembles will be assigned to one of the above groups.

MUEN 494 CONTEMPORARY MUSIC ENSEMBLE. (2) (4 hours) (Prerequisite: audition)

MUEN 495 JAZZ ENSEMBLES. (2) (3-4 hours) (Prerequisite: audition)

MUEN 496 OPERA STUDIO. (4) (3-6 hours) (Prerequisites for B.Mus. (Majors & Honours) & L.Mus.: MUHL 184, MUHL 185, MUTH 110, MUTH 111, MUSP 129, MUSP 131. Other prerequisites for B.Mus. (Majors & Honours) only: MUHL 210, MUHL 211, MUSP 229. Open to Voice Performance students by audition and with practical teacher's approval; open to others by special permission; may be repeated for credit.)

MUEN 497 ORCHESTRAL ENSEMBLES. (2) (6-7 hours) (Prerequisite: audition)

MUEN 498 PERCUSSION ENSEMBLES. (1) (2-3 hours)

MUEN 499 STRING ENSEMBLES. (1) (2-3 hours) (Prerequisite: audition) (Guitar ensemble is restricted to Performance Majors only) (Section 01 Chamber Music) (Section 02 Bass Ensemble) (Section 03 Guitar Ensemble)

MUEN 596 OPERA REPETITEUR. (2) (6 hours) (Open by audition to advanced pianists, and to students in conducting, who are interested in training as operatic coaches. Students enrolled for piano instruction at McGill must also have their practical teacher's

approval) Supervised coaching of singers, and playing of scenes and productions; rehearsal pianists and backstage conducting responsibilities.

MUGT – General Music Techniques

Offered by: Department of Theory

Former Teaching Unit Code: 222

Note: Preference will be given to Music Education students in all MUGT courses.

MUGT 205 PSYCHOLOGY OF MUSIC. (3)

□ **MUGT 215 BASIC CONDUCTING TECHNIQUES.** (1) (1 hour) (Prerequisites: MUTH 110, MUTH 111, MUSP 129.) Development of basic manual dexterity and rehearsal skills. Topics include: preparatory posture, establishing tempo, releases, simple duple and triple metre beat patterns, cueing, dynamics, fermata, transposition, terminology, score preparation, and listening.

● **MUGT 301 TECHNOLOGY AND MEDIA FOR MUSIC EDUCATION.** (3) (3 hours)

□ **MUGT 305 INTRODUCTION TO MUSIC THERAPY.** (3) (3 hours) (Prerequisites: MUTH 210 and MUSP 229) Introduction to basic principles and techniques of music therapy. Topics will include: definitions of music therapy; identifying and developing an understanding of the individual's special needs; simple social, emotional, and physiological therapeutic applications; and music as a motivational tool. Will include limited field observation.

● **MUGT 355 MUSIC IN EARLY CHILDHOOD.** (3) (3 hours)

MUGT 356 MUSIC FOR CHILDREN 1: PHILOSOPHY AND TECHNIQUES. (3) (3 hours) (Prerequisite: none) Introduction to techniques for cultivating musical understanding and creativity in children from age 6 to 12. Traditional and contemporary approaches such as Orff, Kodaly, Dalcroze, Montessori, Gordon, and Carabo-Cone, plus relevant research will be examined for underlying principles of musical development. Will include guided field observation.

MUGT 357 MUSIC FOR CHILDREN 2: PHILOSOPHY AND TECHNIQUES. (3) (3 hours) (Prerequisite: MUGT 356) Continued exploration of techniques for cultivating musical understanding, with emphasis on needs and musical development of older children, and creativity begun in MUGT 356. Will include guided field observation and planning of activity sequences.

● **MUGT 358 GENERAL MUSIC FOR ADULTS AND TEENAGERS.** (3) (Prerequisite: MUTH 210 and MUSP 131.)

MUGT 401 ISSUES IN MUSIC EDUCATION. (3)

● **MUGT 402D1 PRINCIPLES AND PROCESSES OF MUSIC EDUCATION.** (3) (3 hours and Teaching Lab) (Prerequisites or corequisites: one of MUCT 315, MUGT 356, MUIT 315) (Students must also register for MUGT 402D2)

● **MUGT 402D2 PRINCIPLES AND PROCESSES OF MUSIC EDUCATION.** (3) (Prerequisite: MUGT 402D1)

● **MUGT 403 SELECTED TOPICS IN MUSIC EDUCATION.** (3) (3 hours) (Open only to honours students in Music Education or by permission of instructor)

MUGT 404 SELECTED TOPICS IN MUSIC EDUCATION. (3) (3 hours) (Open only to honours students in Music Education or by permission of instructor)

● **MUGT 475 SPECIAL PROJECT.** (3) (Open only to honours students in School Music)

● **MUGT 475D1 SPECIAL PROJECT.** (1.5) (Students must also register for MUGT 475D2)

● **MUGT 475D2 SPECIAL PROJECT.** (1.5) (Prerequisite: MUGT 475D1)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MUHL – Music History and Literature

Offered by: Department of Theory
Former Teaching Unit Code: 214

Note: MUHL courses are cycled every two or three years. Students in Music programs are expected to check with their advisers to ensure that all required and complementary courses are taken by the time of graduation.

MUHL 184 HISTORY SURVEY - MEDIEVAL, RENAISSANCE, BAROQUE. (3) (3 hours) (Corequisites: MUTH 110 and MUSP 129 OR permission of instructor) Representative works from the Carolingian Renaissance to 1750 and their relation to the social and cultural milieu. Basic reference works. Developments in notation, instruments, and performance practice.

MUHL 185 HISTORY SURVEY - CLASSICAL, ROMANTIC, 20TH-C. (3) (3 hours) (Corequisites: MUTH 111 and MUSP 131 OR permission of instructor) Historical and stylistic investigation of music and musical life from circa 1750 to the present, i.e., the transition to the Classical period, the period of C.P.E. Bach and the Mannheim, Berlin, and Viennese symphonists, to recent developments, including electronic and music technology.

MUHL 220 WOMEN IN MUSIC. (3) (3 hours) (Prerequisite: none) Case studies in contributions of selected women to various areas of music (including composition, teaching, performance, and patronage), in Europe and North America, chosen mainly from 19th and 20th centuries. Topics include: women as amateurs and professionals; past restrictions; movement for full acceptance into "musical mainstream" especially during twentieth century.

MUHL 342 HISTORY OF ELECTROACOUSTIC MUSIC. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Open to non-music students by permission of instructor) (Normally offered in alternate years) Investigation of the repertoire and techniques of electro-acoustic music and the historical developments at important centers for research and creative activities. The roles of electronic and computer technologies in commercial and concert music are examined.

● **MUHL 362 POPULAR MUSIC.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

● **MUHL 366 THE ERA OF THE FORTEPIANO.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

● **MUHL 372 SOLO SONG OUTSIDE GERMANY AND AUSTRIA.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

MUHL 373 SPECIAL TOPIC. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

● **MUHL 374 SPECIAL TOPIC.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

MUHL 377 BAROQUE OPERA. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) History of opera from its origins in the musical, literary, and philosophical models available to the Florentine Camerata to the end of the baroque. The development of opera will be studied from the perspective of artistic style and in the light of historical, political, social, and economic conditions.

● **MUHL 380 MEDIEVAL MUSIC.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Corequisites: MUTH 210 and MUSP 229) (Normally alternates with MUHL 381)

● **MUHL 381 RENAISSANCE MUSIC.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Corequisites: MUTH 210 and MUSP 229) (Normally alternates with MUHL 380)

● **MUHL 382 BAROQUE MUSIC.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Normally offered in alternate years)

● **MUHL 383 CLASSICAL MUSIC.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Normally offered in alternate years)

MUHL 384 ROMANTIC MUSIC. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Normally offered in alternate years) The Romantic style as traced by an analysis of works by the major composers of Lied, symphony, symphonic poem, chamber music, and opera.

● **MUHL 385 EARLY TWENTIETH-CENTURY MUSIC.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

MUHL 387 OPERA FROM MOZART TO PUCCINI. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) Mozart's operas and the seria, buffa, and Singspiel traditions. Ottocento opera, grand opera, and cross-fertilization between France and Italy. German Romantic opera. Wagner. Eastern European opera. Verismo and fin-de-siècle opera in Vienna and Paris. Sociology of opera. Emphasis on critical understanding of music's role in articulating drama.

● **MUHL 388 TWENTIETH-CENTURY OPERA.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

● **MUHL 389 ORCHESTRAL LITERATURE.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

MUHL 390 THE GERMAN LIED. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) Survey of the German Lied from the late eighteenth to the early twentieth century, focusing on songs and song cycles by Schubert, Schumann, Brahms, Wolf, Mahler, Schoenberg, Berg, and Webern. Topics include text, musical form and text-music relationships, melodic style and harmonic organization, accompaniment, and performance practice.

● **MUHL 391 CANADIAN MUSIC.** (3) (3 hour) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

MUHL 392 MUSIC SINCE 1945. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) Appearance and evolution of such post-war phenomena as total serialism, "chance" music of various kinds, and electronic music as seen in major figures such as Boulez, Stockhausen, Cage and others in Europe and the United States. Important developments during the 1960. Rise of "minimalism" and "neo-Romanticism" during the 1970s and 80s.

MUHL 393 HISTORY OF JAZZ. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Prerequisite for Jazz Performance Majors: permission of instructor) The evolution of jazz from its origins to the present day. The course centers upon musical issues and will include careful analysis of style based upon recordings, live performances and transcriptions. Ragtime, blues, the Twenties, big-band, swing, bebop, cool, third stream, hard bop and free jazz will be explored.

MUHL 395 KEYBOARD LITERATURE BEFORE 1750. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) The solo repertoire for organ, harpsichord, and clavichord from 1400 to 1750: intabulation, cantus firmus treatment, indigenous keyboard genres, German organ literature, French harpsichord repertoire.

MUHL 396 ERA OF THE MODERN PIANO. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) Survey of keyboard repertoire from 1850 to the present: instruments, the crisis at mid-century, character pieces, Brahms, late Liszt, national schools, commercialization - the concert hall, music for the bourgeois - salon music, Scriabin, the Second Viennese School, Impressionism, Neo-Classicism, Neo-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

Romanticism, serialism, the sonata in the 20th-century, North American composers.

● **MUHL 397 CHORAL LITERATURE AFTER 1750.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231)

MUHL 398 WIND ENSEMBLE LITERATURE AFTER 1750. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) Study of wind ensemble music from Handel to Xenakis as it evolved under the influences of changing musical taste and technological advance. Topics include wind chamber music, music of the French Revolution, the 19th-century military band and the development of school, college and professional bands since 1900.

MUHL 475 SPECIAL PROJECT. (3) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) For details contact the Department of Theory.

May also be available as:

MUHL 475D1, MUHL 475D2, MUHL 475N1, MUHL 475N2

● **MUHL 529 PROSEMINAR IN MUSICOLOGY.** (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Prerequisite: open to all students in a Major or Honours program in Music History, and to students in other programs by permission of instructor) (Normally alternates with MUHL 591)

MUHL 570 RESEARCH METHODS IN MUSIC. (3) (3 hours) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Additional prerequisite: one MUHL or MUPP course at the 300 level or higher, or permission of instructor) Survey and critical evaluation of research- and performance-related tools: composers' collected editions, monuments of music, bibliographies of music and music literature, discographies, directories, and databases. Topics will include: developing bibliographies, structuring written arguments, assessing academic and popular writings about music, and understanding the task of the music editor.

MUHL 591D1 PALEOGRAPHY. (1.5) (1 hour) (Prerequisites: MUHL 184 and MUHL 185 and MUTH 211 OR MUCO 240 and MUSP 231) (Restricted to U3 honours students in History) (Normally alternates with MUHL 529) (Students must also register for MUHL 591D2) (No credit will be given for this course unless both MUHL 591D1 and MUHL 591D2 are successfully completed in consecutive terms) The theory and practice of musical transcription for the period 1100 to 1600. Black modal notation, Franconian notation, French and Italian Ars Nova notation, Mannerism, white mensural notation, proportions, and lute and keyboard tablatures will be studied.

MUHL 591D2 PALEOGRAPHY. (1.5) (Prerequisite: MUHL 591D1) (No credit will be given for this course unless both MUHL 591D1 and MUHL 591D2 are successfully completed in consecutive terms) See MUHL 591D1 for course description.

MUIN – Practical Instrument

Offered by: Department of Performance, Faculty of Music
Former Teaching Unit Code: 224 to 239, 250 to 259, 262 to 265

Note: Registration for MUIN courses (practical instruction and examinations) is not available on Minerva. Students are reminded to submit a Lesson Assignment Card to the Department of Performance by the specified deadlines. MUIN courses will then be added to students' records.

The deadline for withdrawing from practical lessons is the end of the second week of classes in any term.

MUIN 110 ELECTIVE PRACTICAL INSTRUCTION 1. (2)

MUIN 111 ELECTIVE PRACTICAL INSTRUCTION 2 (2)

MUIN 120 PRACTICAL INSTRUCTION 1. (2) (1 hour) (Prerequisite: Admission to the B.Mus. program by audition) (Open to students entering directly from High Schools outside Quebec.)

MUIN 121 PRACTICAL INSTRUCTION 2. (2) (1 hour) (Prerequisite: MUIN 120) (Open to transfer students and high school students entering directly from outside Quebec.)

MUIN 130 PERFORMANCE PRACTICAL INSTRUCTION 1. (4) (1 hour) (Prerequisite: Admission to the B.Mus.) (Performance program by audition) (Open to students entering directly from high schools outside Quebec.)

MUIN 131 PERFORMANCE PRACTICAL INSTRUCTION 2. (4) (1 hour) (Prerequisite: MUIN 130) (Open to transfer students and students entering directly from high schools outside Quebec.)

MUIN 180 FLUTE DOUBLING PROFICIENCY TEST. (0)

MUIN 181 CLARINET DOUBLING PROFICIENCY TEST. (0)

MUIN 182 SAX DOUBLING PROFICIENCY TEST. (0)

MUIN 210 ELECTIVE PRACTICAL INSTRUCTION 3. (2)

MUIN 211 ELECTIVE PRACTICAL INSTRUCTION 4. (2)

MUIN 220 PRACTICAL INSTRUCTION 3. (2) (1 hour) (Prerequisite: MUIN 121)

MUIN 221 CONCENTRATION 1 EXAMINATION. (2) (1 hour) (Prerequisite: MUIN 220) Individual practical lessons and exam.

MUIN 230 PERFORMANCE PRACTICAL INSTRUCTION 3. (4) (1 hour) (Prerequisite: MUIN 131)

MUIN 231 PERFORMANCE 1 EXAMINATION. (4) (1 hour) (Prerequisite: MUIN 230) Individual practical lessons and exam.

MUIN 250 L.MUS. PRACTICAL INSTRUCTION 1. (8) (1 hour) (Prerequisite: Admission to the L.Mus. program by audition)

MUIN 251 L.MUS. PERFORMANCE 1 EXAMINATION. (8) (1 hour) (Prerequisite: MUIN 250) Individual practical lessons and exam.

MUIN 300 VOCAL REPERTOIRE COACHING 1. (2)

MUIN 301 VOCAL REPERTOIRE COACHING 2. (2)

MUIN 310 ELECTIVE PRACTICAL INSTRUCTION 5. (2)

MUIN 311 ELECTIVE PRACTICAL INSTRUCTION 6. (2)

MUIN 320 PRACTICAL INSTRUCTION 5. (2) (1 hour) (Prerequisite: MUIN 221)

MUIN 321 CONCENTRATION 2 EXAMINATION. (2) (1 hour) (Prerequisite: MUIN 320) Individual practical lessons and exam.

MUIN 330 PERFORMANCE PRACTICAL INSTRUCTION 5. (4) (1 hour) (Prerequisite: MUIN 231)

MUIN 331 PERFORMANCE 2 EXAMINATION. (4) (1 hour) (Prerequisite: MUIN 330) Individual practical lessons and exam (a public recital for Piano and voice majors).

MUIN 333 PIANO TECHNIQUES 2. (0) (pass/fail) (Mandatory test for pianists to be taken prior to the Performance 2 Exam.)

MUIN 340 HONOURS PRACTICAL INSTRUCTION 5. (4) (1 hour) (Prerequisite: MUIN 231)

MUIN 341 HONOURS PERFORMANCE 2 EXAMINATION. (4) (1 hour) (Prerequisite: MUIN 340) Individual practical lessons and public recital.

MUIN 350 L.MUS. PRACTICAL INSTRUCTION 3. (8) (1 hour) (Prerequisite: MUIN 251)

MUIN 351 L.MUS. PERFORMANCE 2 EXAMINATION. (8) (1 hour) (Prerequisite: MUIN 350) Individual practical lessons and public recital.

MUIN 369 CONCERTO. (0) (pass/fail) (Mandatory test for pianists)

MUIN 430 PERFORMANCE PRACTICAL INSTRUCTION 7. (4) (1 hour) (Prerequisite: MUIN 331)

MUIN 431 PERFORMANCE 3 EXAMINATION. (4) (1 hour) (Prerequisite: MUIN 430) Individual practical lessons and exam (a public recital for all areas except Jazz).

MUIN 433 PIANO TECHNIQUES 3. (0) (pass/fail) (Mandatory test for pianists to be taken prior to the Performance 3 Exam.)

MUIN 440 HONOURS PRACTICAL INSTRUCTION 7. (4) (1 hour) (Prerequisite: MUIN 341)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MUIT – INSTRUMENTAL TECHNIQUES (MUS)

MUIN 441 HONOURS PERFORMANCE 3 EXAMINATION. (4) (1 hour) (Prerequisite: MUIN 440) Individual practical lessons and public recital.

MUIN 450 L.MUS. PRACTICAL INSTRUCTION 5. (8) (1 hour) (Prerequisite: MUIN 351)

MUIN 451 L.MUS. PERFORMANCE 3 EXAMINATION. (8) (1 hour) (Prerequisite: MUIN 450) Individual practical lessons and public recital.

MUIN 460 ARTIST DIPLOMA PRACTICAL INSTRUCTION 1. (8) (1.5 hours) (Prerequisite: admission to the Artist Diploma program by audition.)

MUIN 461 ARTIST DIPLOMA RECITAL 1. (8) (1.5 hours) (Prerequisite: MUIN 460) Individual practical lessons and recital.

MUIN 469 ARTIST DIPLOMA CONCERTO 1. (1) (Prerequisite: MUIN 460)

MUIN 560 ARTIST DIPLOMA PRACTICAL INSTRUCTION 3. (8) (1.5 hours) (Prerequisite: MUIN 461)

MUIN 561 ARTIST DIPLOMA RECITAL 2. (8) (1.5 hours) (Prerequisite: MUIN 560) Individual practical lessons and recital.

MUIN 562 ARTIST DIPLOMA RECITAL 3. (8) (1.5 hours) (Prerequisite: MUIN 560) Individual practical lessons and recital.

MUIN 569 ARTIST DIPLOMA CONCERTO 2. (1) (Prerequisite: MUIN 469)

MUIT – Instrumental Techniques

Offered by: Department of Theory
Former Teaching Unit Code: 223

Note: Preference will be given to Music Education students in all MUIT courses.

☐ **MUIT 201 STRING TECHNIQUES.** (3) (3 hours and 2 hours lab) (Corequisites: MUTH 110 or MUTH 111 AND MUSP 129 or MUSP 131 AND MUHL 184 or MUHL 185.) The fundamental techniques in performance of four common stringed instruments, i.e., violin, viola, cello, and bass. Principles of sound production on stringed instruments, historical development of the strings, purchase of new and used instruments, maintenance and repairs, teaching procedures and reference materials.

☐ **MUIT 202 WOODWIND TECHNIQUES.** (3) (3 hours and 2 hours lab) (Corequisites: MUTH 110 or MUTH 111 AND MUSP 129 or MUSP 131 AND MUHL 184 or MUHL 185.) The fundamental techniques in performance of five common woodwind instruments, i.e., clarinet, flute, oboe, bassoon, and saxophone. Principles of sound production, historical development of the woodwinds, purchase of new and used instruments, maintenance and repairs, teaching procedures and reference materials.

☐ **MUIT 203 BRASS TECHNIQUES.** (3) (3 hours and 2 hours lab) (Corequisites: MUTH 110 or MUTH 111 AND MUSP 129 or MUSP 131 AND MUHL 184 or MUHL 185.) The fundamental techniques in performance of five common brass instruments, i.e., trumpet, horn, trombone, baritone, and tuba. Principles of sound production, historical development of the brass, purchase of new and used instruments, maintenance and repairs, teaching procedures and reference materials.

☐ **MUIT 204 PERCUSSION TECHNIQUES.** (3) (3 hours and 2 hours lab) (Corequisites: MUTH 110 or MUTH 111 AND MUSP 129 or MUSP 131 AND MUHL 184 or MUHL 185.) The fundamental techniques in performance of percussion instruments commonly in use in symphonic bands and orchestras. Principles of sound production, historical development of the percussion, purchase of new and used instruments, maintenance and repairs, teaching procedures and reference materials.

● ☐ **MUIT 250 GUITAR TECHNIQUES.** (3) (3 hours) (Corequisites: MUTH 110 or MUTH 111 AND MUSP 129 or MUSP 131 AND MUHL 184 or MUHL 185.)

● ☐ **MUIT 302 ADVANCED WIND TECHNIQUES.** (3) (3 hours and 2 hours lab) (Prerequisites: MUIT 202, MUIT 203.) Continued explo-

ration of brass and woodwind pedagogy. Methods for developing technique and musical sensitivity in beginning and intermediate performers will be explored through in-depth study of heterogeneous and homogeneous instrumental methods. Skill on secondary instruments and diagnostic and prescriptive teaching abilities will be extended through Lab performances and individual coaching projects.

☐ **MUIT 315 INSTRUMENTAL CONDUCTING.** (3) (3 hours and 2 hours lab) (Prerequisites: MUTH 211, MUSP 229, MUGT 215, MUIT 201 or MUIT 250, MUIT 202, MUIT 203, MUIT 204. Open to non-music education students with permission of instructor.) The fundamental skills of instrumental conducting, including baton technique, score analysis, and rehearsal procedures; conducting materials are selected from representative orchestral works.

☐ **MUIT 356 JAZZ INSTRUCTION: PHILOSOPHY AND TECHNIQUES.** (3) (3 hours) (Prerequisites: MUIT 202, MUIT 203, MUIT 204. May be taken by Jazz Performance students with approval of instructor.) Introduction to techniques for the development of school and community-based jazz programs. Topics will include: philosophy of jazz instruction, rhythm section, musical materials, techniques to develop improvisation and aural skills, jazz styles, score preparation, rehearsal techniques, and administration of jazz programs. Will include observation of rehearsals and coaching opportunities.

● ☐ **MUIT 415 ADVANCED INSTRUMENTAL CONDUCTING.** (3) (3 hours and 2 hours lab) (Prerequisites: MUIT 315 AND audition.)

MUJZ – Jazz Studies

Offered by: Department of Performance
Former Teaching Unit Code: 240

Note: MUJZ courses are normally open to Music Jazz Majors only. Other students may register only if space exists **and** with permission of the instructor.

MUJZ 160 JAZZ MATERIALS 1. (3) (4 hours) (Prerequisite: none. Open to non-jazz majors, space permitting, but not for elective credit in B.Mus. or Artist Diploma programs) Fundamental aural and theoretical skills associated with the jazz idiom. Nomenclature, chord construction, chord/scale relationships, harmonic progression, circle of 5ths, simple turnarounds, simple substitution, symmetrical scales and chord relationships, voice leading.

MUJZ 161 JAZZ MATERIALS 2. (3) (4 hours) (Prerequisite: MUJZ 160. Open to non-jazz majors, space permitting, but not for elective credit in B.Mus. or Artist Diploma programs) Simple and advanced substitution, borrowed chords, reharmonisation, modes of harmonic minor and melodic minor diatonic systems, unresolved tensions, odd and infrequent modulations, mixed two-five-ones, introduction to polychords, slashchords and non-functional harmony.

MUJZ 170 JAZZ KEYBOARD PROFICIENCY 1. (1) (1 hour) (Prerequisite: none. Open only to Jazz Performance Majors. May not be taken for elective credit in B.Mus. or Artist Diploma programs) Basic piano skills, basic comping techniques, standard 3 note rootless voicings in 7, 3 and 3, 7 position with one extension, two-five-ones in major and minor - limited keys. Simple substitution and reharmonisation.

MUJZ 171 JAZZ KEYBOARD PROFICIENCY 2. (1) (1 hour) (Prerequisite: MUJZ 170. Open only to Jazz Performance Majors. May not be taken for elective credit in B.Mus. or Artist Diploma programs) Continuation of previous semester. Two-five-ones and mixed two-five-ones using 4 note close position voicings and 4 and 5 note spreads, in all keys, diminished passing chords, half step shifts, voice leading extensions, quartal and modal voicing, sight reading of standard jazz repertoire.

MUJZ 223 JAZZ IMPROVISATION/MUSICIANSHIP 1. (3) (3 hours) (Prerequisite: none. Open only to Jazz Performance Majors) Basic improvisational concepts with emphasis on time feel, phrasing, articulation, melodic development, voice leading, harmonic control and stylistic nuance. Memorization and aural recognition of stand-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

ard jazz repertoire also stressed. The aural tradition of the music is emphasized through rhythmic/melodic dictation.

MUJZ 224 JAZZ IMPROVISATION/MUSICIANSHIP 2. (3) (3 hours) (Prerequisite: MUJZ 223. Open only to Jazz Performance Majors) Continuation of Jazz Improvisation/Musicianship MUJZ 223.

● **MUJZ 261 JAZZ ARRANGING.** (6) (3 hours) (Corequisite: MUJZ 223) (Open only to Jazz Performance Majors)

MUJZ 261D1 JAZZ ARRANGING. (3) (Students must also register for MUJZ 261D2) (No credit will be given for this course unless both MUJZ 261D1 and MUJZ 261D2 are successfully completed in consecutive terms) (MUJZ 261D1 and MUJZ 261D2 together are equivalent to MUJZ 261) Introduction to concepts and techniques commonly used in jazz arranging. Notation, calligraphy and score preparation are discussed; class lectures include study of classic and contemporary scores by prominent jazz arrangers. Student writing projects for ensembles ranging from two horns to full jazz ensemble are recorded and discussed in class.

MUJZ 261D2 JAZZ ARRANGING. (3) (Prerequisite: MUJZ 261D1) (No credit will be given for this course unless both MUJZ 261D1 and MUJZ 261D2 are successfully completed in consecutive terms) (MUJZ 261D1 and MUJZ 261D2 together are equivalent to MUJZ 261) See MUJZ 261D1 for course description.

May also be available as: MUJZ 261N1, MUJZ 261N2

● **MUJZ 340 JAZZ COMPOSITION.** (6) (3 hours) (Prerequisites: MUJZ 224 and MUJZ 261. Open only to Jazz Performance Majors)

MUJZ 340D1 JAZZ COMPOSITION. (3) (Students must also register for MUJZ 340D2) (No credit will be given for this course unless both MUJZ 340D1 and MUJZ 340D2 are successfully completed in consecutive terms) (MUJZ 340D1 and MUJZ 340D2 together are equivalent to MUJZ 340) A writing course based on the stylistic concepts of leading jazz composers. Development of a personal and creative compositional style and of control of factors such as: rhythmic, harmonic, and melodic continuity, vertical modal, and linear modal harmony, polychordal techniques, and non-functional harmonic concepts. Analysis and discussion of selected compositions.

MUJZ 340D2 JAZZ COMPOSITION. (3) (Prerequisite: MUJZ 340D1) (No credit will be given for this course unless both MUJZ 340D1 and MUJZ 340D2 are successfully completed in consecutive terms) (MUJZ 340D1 and MUJZ 340D2 together are equivalent to MUJZ 340) See MUJZ 340D1 for course description.

MUJZ 356 JAZZ PEDAGOGY. (3) (3 hours) (Prerequisites: MUHL 393 and MUJZ 224. Open only to Jazz Performance Majors) Techniques for development of school, community-based and post-secondary jazz programs. Topics include: philosophy of jazz instruction, curriculum development, rhythm section, musical materials, techniques to develop improvisation and aural skills, jazz styles, idiomatic instrumental techniques, score preparation, rehearsal techniques and administration of jazz programs. May include coaching opportunities.

MUJZ 423 JAZZ IMPROVISATION/MUSICIANSHIP 3. (3) (3 hours) (Prerequisite: MUJZ 224. Corequisite: MUJZ 340. Open only to Jazz Performance Majors) Refinement of improvisational concepts in conjunction with ear training, leading towards the establishment of a personal style of playing. Complex forms and harmonies, and contemporary techniques. Memorization of large and varied repertoire is stressed. The ability to identify, transcribe and perform various melodies, rhythms, and complex harmonies by ear will be stressed.

MUJZ 424 JAZZ IMPROVISATION/MUSICIANSHIP 4. (3) (3 hours) (Prerequisite: MUJZ 423. Open only to Jazz Performance Majors) Continuation of Jazz Improvisation/Musicianship MUJZ 423.

● **MUJZ 440 ADVANCED JAZZ COMPOSITION.** (4) (2 hours) (Prerequisite: MUJZ 340. Corequisite: MUJZ 423. Open only to Jazz Performance Majors)

MUJZ 440D1 ADVANCED JAZZ COMPOSITION. (2) (Students must also register for MUJZ 440D2) (No credit will be given for this course unless both MUJZ 440D1 and MUJZ 440D2 are successfully completed in consecutive terms) (MUJZ 440D1 and MUJZ

440D2 together are equivalent to MUJZ 440) A continuation of MUJZ 340. This course will emphasize and facilitate the development of a personal and creative compositional style. Jazz aesthetics will be emphasized and explored in greater depth.

MUJZ 440D2 ADVANCED JAZZ COMPOSITION. (2) (Prerequisite: MUJZ 440D1) (No credit will be given for this course unless both MUJZ 440D1 and MUJZ 440D2 are successfully completed in consecutive terms) (MUJZ 440D1 and MUJZ 440D2 together are equivalent to MUJZ 440) See MUJZ 440D1 for course description.

MUJZ 461D1 ADVANCED JAZZ ARRANGING. (2) (2 hours) (Prerequisites: MUJZ 261 and MUJZ 340 OR permission of instructor. Corequisite: MUJZ 423. Open only to Jazz Performance Majors) (Students must also register for MUJZ 461D2) (No credit will be given for this course unless both MUJZ 461D1 and MUJZ 461D2 are successfully completed in consecutive terms) This course introduces advanced concepts in jazz writing by examining scores by historically-important jazz composers/arrangers, as well as contemporary masters. Student writing, including expanded combo, big band, and small group string projects, is geared toward public performance by McGill jazz ensembles and combos.

MUJZ 461D2 ADVANCED JAZZ ARRANGING. (2) (Prerequisite: MUJZ 461D1) (No credit will be given for this course unless both MUJZ 461D1 and MUJZ 461D2 are successfully completed in consecutive terms) See MUJZ 461D1 for course description.

MUJZ 493 JAZZ PERFORMANCE PRACTICE. (3) (3 hours) (Prerequisites: MUHL 393, MUJZ 224. Open only to Jazz Performance Majors) An in-depth exploration of the performance practice of leading jazz figures, primarily through the study of solo transcriptions. Comparative study of conceptual differences in time feel, ornamentation, tone quality, articulation and harmonic and melodic approach. Detailed study of major rhythm sections and their interaction with soloists.

MUMT – Music Technology

Offered by: Department of Theory
Former Teaching Unit Code: 216

MUMT 201 INTRODUCTION TO MUSIC TECHNOLOGIES. (3) (3 hours) (Prerequisite: none) (Not open to students in the following programs: B.Mus. Honours in Music Technology; B.Mus. Minor in Music Technology; B.A. Minor Concentration in Music Technology; B.Sc., Minor in Music Technology) A general introduction to the history and techniques of music technology to include: synthesis, MIDI, sequencing, sampling, digital audio, music and audio for the Internet, sound recording, interactive music systems, and notation systems.

□ **MUMT 202 FUNDAMENTALS OF NEW MEDIA.** (3) (3 hours) (Prerequisites: none) (Open only to students in Music Technology, including those in Minor Programs, and students in Sound Recording, and Composition) Combining theory and practice, the course covers the areas of MIDI, sound/image/MIDI sequencing, sampling, mixing, soundfile processing and editing, elementary music systems programming, and use of the Internet for sound/music/image.

□ **MUMT 203 INTRODUCTION TO DIGITAL AUDIO.** (3) (3 hours) (Prerequisite: MUMT 202) An introduction to the theory and practice of digital audio. Topics include: sampling theory; digital sound synthesis methods (additive, subtractive, summation series); sound processing (digital mixing, delay, filters, reverb, sound localization); software-based samplers; real-time sound processing; interactive audio systems. Hands-on exercises are included.

□ **MUMT 232 INTRODUCTION TO ELECTRONICS.** (3) (2 hours lecture plus 2 hours laboratory) (Prerequisite or corequisite: MATH 112. Available as Arts/Science elective in B.Mus. programs) Basics of electricity including: Ohm's law, electronic components, DC circuits, block diagram, amplifiers, filters, power supplies, electrical measurements (frequency levels, distortion). Emphasis will be placed on electronics applied to audio.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

☐ **MUMT 300D1 INTRODUCTION TO MUSIC RECORDING.** (3) (3 hours lecture plus 4 hours studio time) (Prerequisite: MUCO 242 or MUCO 341. Prerequisites or corequisites: MUTH 211 and permission of instructor.) (It is recommended that all students taking this course register concurrently for PHYS 224 Physics and Psychophysics of Music if they do not already have a background in this subject.) (Students must also register for MUMT 300D2) (No credit will be given for this course unless both MUMT 300D1 and MUMT 300D2 are successfully completed in consecutive terms) The theory and practice of music recording including a study of recording environments, equipment and studio techniques. The analysis of music scores and recordings with respect to the requirements and possibilities of the recording studio. Studio work will include recording sessions, recording of live concerts, editing, mixing and music p.a.

MUMT 300D2 INTRODUCTION TO MUSIC RECORDING. (3) (Prerequisite: MUMT 300D1) (No credit will be given for this course unless both MUMT 300D1 and MUMT 300D2 are successfully completed in consecutive terms) See MUMT 300D1 for course description.

MUMT 301 MUSIC AND THE INTERNET. (3) (3 hours) (Prerequisite: MUMT 201 OR MUMT 202) Technologies and resources of the Internet (access tools, data formats and media) and Web authoring (HTML) for musicians; locating, retrieving and working with information; putting information online; tools for music research, music skills development, technology-enhanced learning, music productivity, and promotion of music and musicians. Evaluation of Internet music resources.

☐ **MUMT 302 NEW MEDIA PRODUCTION 1.** (3) (3 hours) (Prerequisite: MUMT 201 OR MUMT 202) (Not open to students in B.Mus. Honours in Music Technology) Methods and techniques for producing and modifying musical and audiovisual content in new media applications. Media formats: audiovisual sequences (QuickTime), CD-ROMs and interactive CD-ROMs, DVD, surround sound audio. Also covered: software-based synthesis and sampling, techniques for image scanning, audio capture, content manipulation, media compression and format conversion.

☐ **MUMT 303 NEW MEDIA PRODUCTION 2.** (3) (3 hours) (Prerequisite: MUMT 301) (Not open to students in B. Mus. Honours in Music Technology) A continuation of MUMT 302. Students produce new media objects of increasing complexity and scope, integrating several types of content.

☐ **MUMT 306 MUSIC AND AUDIO COMPUTING 1.** (3) (3 hours) (Prerequisites: MUMT 202 and MUMT 203. Pre-/Co-requisite: COMP 251) Concepts, algorithms, data structures, and programming techniques for the development of music and audio software, ranging from musical instrument design to interactive music performance systems. Student projects will involve the development of various music and audio software applications.

☐ **MUMT 307 MUSIC AND AUDIO COMPUTING 2.** (3) (3 hours) (Prerequisite: MUMT 306) Advanced programming techniques for the development of music and audio software, and system components (plugins). Development of audio and control systems. Advanced data structures, object-oriented programming, optimization of source code for DSP, debugging techniques. Projects will involve the development of various musical and audio software applications and plugins.

☐ **MUMT 339 INTRODUCTION TO ELECTROACOUSTICS.** (3) (2 hours lecture plus 2 hours laboratory) (Prerequisite: MUMT 232. Available as Arts/Science elective in B.Mus. programs) Basic principles of operation and design of electroacoustical devices and systems; transducers and signal processing devices; magnetic tape sound recording - reproducing systems; disc recording, motion picture sound recording and reproducing systems; practical demonstration of some of these devices and associated measuring, testing and analyzing equipment and techniques.

☐ **MUMT 402 ADVANCED MULTIMEDIA DEVELOPMENT.** (3) (3 hours) (Prerequisite: MUMT 307) Design, programming, and deployment of music and audio in multimedia production. Topics include: compression and decompression schemes, music and audio support in C++, JAVA, and applications languages. Develop-

ment of platform independent software for interactive and networked music and audio.

● **MUMT 475 SPECIAL PROJECT.** (3) (Prerequisite: permission of Dept. of Theory)

☐ **MUMT 502 SENIOR PROJECT: MUSIC TECHNOLOGY.** (3) (3 hours) (Prerequisites: MUMT 307 and Honours standing in Music Technology) Independent senior project in Music Technology. Students will design and implement a medium-scale project in consultation with their advisor. Evaluation will be based on concept, background research, implementation, reliability, and documentation.

MUPG – Performance

Offered by: Department of Performance

Former Teaching Unit Code: 242

MUPG 100 LIFE AS PROFESSIONAL MUSICIAN. (1) (1 hour) (Prerequisite: none. May not be taken for elective credit in B.Mus. or Artist Diploma programs) An introduction to the responsibilities and skills required of a professional musician; job options, stage presence, rehearsal etiquette, contracts, professional organizations, freelancing, auditions, special health problems, etc.

● **MUPG 201 BASIC LYRIC DICTION 1.** (1) (2 hours.) (Restriction(s): for voice concentration students, and others with permission of instructor. Not available to vocal performance students.) Practical application of the fundamentals of English, Italian and Latin pronunciation in singing, utilizing the International Phonetic Alphabet in song, opera, oratorio and choral texts.

● **MUPG 202 BASIC LYRIC DICTION 2.** (1) (Restriction(s): for voice concentration students, and others with permission of instructor. Not available to vocal performance students.) Practical application of the fundamentals of German, French and Spanish pronunciation in singing, utilizing the International Phonetic Alphabet in song, opera, oratorio and choral texts.

☐ **MUPG 210 ITALIAN DICTION.** (2) (2 hours) (Prerequisite: none) Study of International Phonetic Alphabet. Study of Italian pronunciation in singing using song and opera texts.

☐ **MUPG 211 FRENCH DICTION.** (2) (2 hours) (Prerequisite: MUPG 210) Study of French pronunciation in singing using song and opera texts.

☐ **MUPG 212 ENGLISH DICTION.** (2) (2 hours) (Prerequisite: none) Study of International Phonetic Alphabet. Study of Standard English pronunciation in singing using song and opera texts with a special emphasis on problematic vowels, diphthongs and consonants.

☐ **MUPG 213 GERMAN DICTION.** (2) (2 hours) (Prerequisite: MUPG 212) Study of German pronunciation in singing using song and opera texts.

● ☐ **MUPG 214 DICTION - EAST EUROPEAN LANGUAGES.** (2) (2 hours)

☐ **MUPG 272D1 CONTINUO.** (2) (2 hours) (Prerequisites: MUTH 111 AND permission of instructor. Enrolment limited to 6) (Students must also register for MUPG 272D2) (No credit will be given for this course unless both MUPG 272D1 and MUPG 272D2 are successfully completed in consecutive terms) An historically-oriented study of the principles of figured-bass. The student will realize at sight elementary bass patterns. Standard idioms from historical treatises will be introduced.

MUPG 272D2 CONTINUO. (2) (Prerequisite: MUPG 272D1) (No credit will be given for this course unless both MUPG 272D1 and MUPG 272D2 are successfully completed in consecutive terms) See MUPG 272D1 for course description.

● **MUPG 302 SEMINAR IN PIANO PEDAGOGY.** (1)

● **MUPG 305 VOCAL MUSIC PRACTICES.** (3)

MUPG 315D1 INTRODUCTION TO ORCHESTRAL CONDUCTING. (2) (2 hours) (Prerequisites: MUTH 211, MUP 229, MUCO 261, MUGT 215, and permission of instructor) (Students must also register for MUPG 315D2) (No credit will be given for this course unless both

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MUPG 315D1 and MUPG 315D2 are successfully completed in consecutive terms) Emphasis on classical repertoire (Haydn, Mozart, Beethoven). Practical analysis and score preparation, style, and interpretation. Development of clear and expressive technique. Some practical experience.

MUPG 315D2 INTRODUCTION TO ORCHESTRAL CONDUCTING. (2) (Prerequisite: MUPG 315D1) (No credit will be given for this course unless both MUPG 315D1 and MUPG 315D2 are successfully completed in consecutive terms) See MUPG 315D1 for course description.

MUPG 370 KEYBOARD IMPROVISATION 1. (2) (2 hours) (Prerequisites: audition and Piano Major Performance 1 Examination or audition for students in programs other than Performance. Open to all keyboard instruments except Jazz) Development of harmonic skills necessary for simple improvised accompaniment, using classical folk and popular music examples. Left-hand accompaniment in varied metres. Different forms of arpeggiation and left-hand accompaniment. Modal materials. Pedal-point. Free improvisation within simple formal structures. Recordings and published materials used to support individual development.

● **MUPG 371 KEYBOARD IMPROVISATION 2.** (2) (2 hours) (Prerequisite: MUPG 370)

□ **MUPG 372D1 CONTINUO.** (1) (1 hour) (Prerequisites: MUPG 272 AND permission of instructor. Enrolment limited to 4) (Students must also register for MUPG 372D2) (No credit will be given for this course unless both MUPG 372D1 and MUPG 372D2 are successfully completed in consecutive terms) A study of 17th and 18th Century styles of figured-bass accompaniment as revealed in contemporary sources. The emphasis will be on the realization at the keyboard of representative works using original sources.

MUPG 372D2 CONTINUO. (1) (Prerequisite: MUPG 372D1) (No credit will be given for this course unless both MUPG 372D1 and MUPG 372D2 are successfully completed in consecutive terms) See MUPG 372D1 for course description.

MUPG 473 SPECIAL PROJECT IN PERFORMANCE. (1) For details, contact the Department of Performance.

MUPG 474 SPECIAL PROJECT IN PERFORMANCE. (2) For details, contact the Department of Performance.

MUPG 475 SPECIAL PROJECT IN PERFORMANCE. (3) For details, contact the Department of Performance.

● **MUPG 541 SENIOR PIANO SEMINAR 1.** (2) (3 hours) (Prerequisite(s): MUIN 331 and 4 semesters of MUEN 493) (Restriction: Only open to Faculty of Music Piano Performance students)

● **MUPG 542 SENIOR PIANO SEMINAR 2.** (2) (3 hours) (Prerequisite: MUPG 541) (Restriction: Only open to Faculty of Music Piano Performance students.)

MUPP – Performance Practice

Offered by: Department of Theory
Former Teaching Unit Code: 215

Note: MUPP courses are cycled every two or three years. Students in Music programs are expected to check with their advisers to ensure that all required and complementary courses are taken by the time of graduation.

□ **MUPP 381 TOPICS: PERFORMANCE PRACTICE BEFORE 1800.** (3) (3 hours) (Enrolment limited to 20. May not be taken by students who have had MUPP 381, MUPP 382, or MUPP 384, except by permission of instructor) Issues in performance practice of pre-nineteenth-century music. Topics may include rhythmic interpretation, voices and instruments in Medieval and Renaissance polyphony, ornamentation, improvisation, performance venues and context. Sources include original notation and modern editions, treatises, iconography, organology, analysis, criticism, and recordings.

● □ **MUPP 385 TOPICS: PERFORMANCE PRACTICE AFTER 1800.** (3) (3 hours) (Enrolment limited to 20)

MUSP – Musicianship

Offered by: Department of Theory
Former Teaching Unit Code: 212

Note: Students complete Prepared, Sight, and Listening tasks in the following areas: rhythm, tonal melodic structures, atonal structures, isolated sonorities, multipart structures, score reading and harmonic progressions. Documents describing the McGill Musicianship Program are available from course coordinators and are published in the Anthology and in course materials.

Students must complete three of five Listening Tasks (one of which must be Tonal Melodic Structures) in the final segments of both MUSP 129 and MUSP 131 before proceeding to the next Musicianship course.

MUSP 129 MUSICIANSHIP 1. (2) (2 hours, plus 2 hours Choral Solfège Lab) (Prerequisite: Admission to the B.Mus. or L.Mus. program through audition and placement tests in Musicianship (including Keyboard Proficiency) and Theory. Open to students from other Faculties with permission of Musicianship Co-ordinator; McGill Conservatory Secondary V or equivalent level in Ear Training. Corequisites: MUTH 110 and MUSP 170) Rhythm (basic duple-triple divisions); Isolated Sonorities (intervals, triads, tonal-modal collections); non-modulating Tonal Melodic Structures; Score Reading with treble-bass-alto clefs; Atonal Structures (cells with intervals to fifth excluding tritone); species-counterpoint-like Multipart Structures; Repertoire Building (MUTH 110).

MUSP 129D1 MUSICIANSHIP 1. (1) (Students must also register for MUSP 129D2) (No credit will be given for this course unless both MUSP 129D1 and MUSP 129D2 are successfully completed in consecutive terms) (MUSP 129D1 and MUSP 129D2 together are equivalent to MUSP 129)

MUSP 129D2 MUSICIANSHIP 1. (1) (Prerequisite: MUSP 129D1) (No credit will be given for this course unless both MUSP 129D1 and MUSP 129D2 are successfully completed in consecutive terms) (MUSP 129D1 and MUSP 129D2 together are equivalent to MUSP 129)

MUSP 131 MUSICIANSHIP 2. (2) (2 hours, plus 2 hours Choral Solfège Lab) (Prerequisite: MUSP 129. Corequisites: MUTH 111 and MUSP 171) (Students must complete three of five Listening Tasks (one of which must be Tonal Melodic Structures) in the final segments of both MUSP 129 and MUSP 131 before proceeding to the next Musicianship course.) Rhythm (quadruple-mixed divisions); Isolated Sonorities (voiced triads, dominant sevenths); chromatically-embellished modulating Tonal Melodic Structures; Score Reading with treble-bass-alto-tenor clefs; Atonal Structures (cells with intervals to seventh); diatonic Harmonic Progressions; Repertoire Building (MUTH 111).

MUSP 170 KEYBOARD PROFICIENCY. (1) (1 hour) (Prerequisite: Admission to the B.Mus. or L.Mus. program through audition and placement tests in Musicianship and Theory) A remedial piano skills course for students who have been admitted to the B.Mus. or L.Mus. program but who were unable to pass the basic Keyboard Proficiency Test administered to all incoming students (with the exception of those students whose principal instrument is keyboard, who are automatically exempt from MUSP 170). The course focuses on preparing students to retake the Test (see Keyboard Proficiency Test).

MUSP 171 KEYBOARD LAB. (1) (1 hour) (Prerequisite: completion of, or concurrent re-enrolment in, MUSP 170. Corequisites: MUTH 111 and MUSP 131) (All students admitted to B.Mus and L.Mus. programs, including those with keyboard or guitar as their principal instrument, are required to take MUSP 171 Keyboard Lab, unless exempt on the basis of a placement test. Students who are exempt from MUTH 111 through placement tests must still take MUSP 171 (unless exempt) since this course forms the foundation of keyboard-based musicianship tasks at upper levels. (All Majors in Jazz Performance substitute MUJZ 171 for MUSP 171. Students in Jazz Performance who have completed MUJZ 170 and MUJZ 171, and who transfer to a Department of Theory program, will be required

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

to complete MUSP 171.) Students who do not achieve a continuation pass in MUSP 171 must reregister for the course in the semester immediately following. Students who do not achieve a continuation pass after repeating the course will not be allowed to proceed with further Musicianship or Theory studies until a continuation pass is achieved. Tests for MUSP 171 are held in August-September, December-January, and April-May [as well as during the Summer Session when course(s) offered], the exact dates determined by the Department of Theory.) Course contents parallel those of MUTH 111 with emphasis on memorization of diatonic paradigmatic harmonic progressions (prolongational and cadential) and on their combination in phrases; realization of elementary figured bass; additional tasks include harmonization of simple melodies and elementary score reading using treble, bass, and alto clefs (also some tenor clef).

MUSP 229 MUSICIANSHIP 3. (2) (2 hours, plus Keyboard Lab) (Prerequisite: MUSP 131. Corequisite: MUTH 210) Rhythm (six-, five- and seven-part subdivisions); Isolated Sonorities (triads, dominant, supertonic, leading-tone sevenths); Tonal Melodic Structures tonicizing V, III (also vi, v); Score Reading with treble-bass-alto-tenor clefs; Atonal Structures (basic cell combinations); dance-suite Multipart Structures; Harmonic Progressions including sequential paradigms; Repertoire Building (MUTH 210).

MUSP 231 MUSICIANSHIP 4. (2) (2 hours, plus Keyboard Lab) (Prerequisite: MUSP 229. Corequisite: MUTH 211) Rhythm (eight-part subdivisions, smaller note values); Isolated Sonorities (applied, neapolitan, augmented sixth chords); Tonal Melodic Structures tonicizing related scale-steps; Score Reading with treble-bass-alto-tenor-soprano clefs; Atonal Structures (basic cell combinations); instrumental-texture Multipart Structures; applied chords and tonicizations in Harmonic Progression; Repertoire Building (MUTH 211).

MUSP 329 MUSICIANSHIP 5. (2) (2 hours) (Prerequisite: MUSP 231. Corequisite: MUTH 310 or MUTH 327) Rhythm (mixed divisions, basic polyrhythms); Isolated Sonorities (dominant ninths, thirteenth, diminished sevenths, augmented sixths); chromaticism, mixture, enharmonicism in 19th-century Tonal Melodic Structures; Atonal Structures (extended melodies with basic cells); instrumental-texture Multipart Structures; Harmonic Progression with early-19th-century uses of chromatic chords; Score Reading (19th-century repertoire).

MUSP 331 MUSICIANSHIP 6. (2) (2 hours) (Prerequisite: MUSP 329. Corequisite: MUTH 311 or MUTH 427) Rhythm (20th-century practices); Isolated Sonorities (trichordal set-classes); chromatically-complex shorter or longer common-practice Tonal Melodic Structures; Atonal Structures (20th-century repertoire items); two-part 20th-century Multipart Structures; Harmonic Progression with late-19th-century chromatic and extended-modulatory paradigms; Score Reading (20th-century repertoire).

MUTH – Music Theory and Analysis

Offered by: Department of Theory
Former Teaching Unit Code: 211

MUTH 110 MELODY AND COUNTERPOINT. (3) (4 hours) (Prerequisite: Matriculation Music or McGill Conservatory Theory Secondary V or its equivalent. Corequisites: MUSP 129 and MUSP 170 or permission of co-ordinator or instructor) Introduction to principles of melodic and contrapuntal structure through the traditional species of counterpoint: first through fifth species in two parts; first species in three parts. Analysis and compositional modelling of repertoire in medieval-renaissance and 20th-century idioms. Notation, elementary acoustics, review of rudiments.

MUTH 111 ELEMENTARY HARMONY AND ANALYSIS. (3) (4 hours) (Prerequisite: MUTH 110. Corequisites: MUSP 131 and MUSP 171) Diatonic chords, harmonic progression, the concept and practice of tonality, simple modulation, seventh chords and secondary dominants. Small forms from c.1700 to the early 19th Century will be analyzed. Written four-part exercises will be required.

MUTH 210 TONAL THEORY AND ANALYSIS 1. (3) (3 hours) (Prerequisites: MUTH 110 and MUTH 111. Corequisite: MUSP 229. Prerequisite or corequisite: MUSP 171) Compositional resources of early and mid-18th Century music. Thorough review of elementary harmonic procedure. Introduction to chromatic alteration and linear chords, and to analysis of imitative and invertible counterpoint. Analysis of common forms of the period c.1700 - 1770, including principal Baroque forms, but not including the Classical sonata.

MUTH 211 TONAL THEORY AND ANALYSIS 2. (3) (3 hours) (Prerequisite: MUTH 210. Corequisite: MUSP 231) Compositional resources of late 18th and early 19th Century music. Analysis of forms common to the period c.1770 - 1830, including Classical sonata forms in several media. Writing of short pieces for keyboard, piano and voice, and string quartet.

☐ **MUTH 301 MODAL COUNTERPOINT 1.** (3) (3 hours) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) Polyphonic techniques of the Renaissance period studied through analysis of works by Palestrina and others and through written exercises in two to three voices.

☐ **MUTH 302 MODAL COUNTERPOINT 2.** (3) (3 hours) (Prerequisite: MUTH 301) Continuation of Modal Counterpoint I. Study of more advanced techniques through further analysis and written exercises in three or more voices.

☐ **MUTH 303 TONAL COUNTERPOINT 1.** (3) (3 hours) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) The contrapuntal techniques of J.S. Bach studied through detailed technical analysis of his work and through written exercises in two to three parts.

☐ **MUTH 304 TONAL COUNTERPOINT 2.** (3) (3 hours) (Prerequisite: MUTH 303) Continuation of Tonal Counterpoint 1. Further analysis and written exercises in three to four parts with special emphasis on fugal techniques.

MUTH 310 MID AND LATE 19TH-CENTURY THEORY AND ANALYSIS. (3) (3 hours) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) Expanded harmonic resources of the late 19th Century (e.g., foreign modulation, chromatic harmony). Analysis of characteristic small and large forms. Development of writing and analytical skills with a goal toward perceiving how levels of musical structure interact.

MUTH 311 20TH-CENTURY THEORY AND ANALYSIS. (3) (3 hours) (Prerequisite: MUTH 310) Exploration of 20th-Century systems of pitch organization and attitudes toward counterpoint (e.g., polytonality, modal systems, neo-classical tonality, linear counterpoint, etc.). Examination of the relationship of these systems to earlier practices. Development of written and analytical skills for the purpose of gaining insight into 20th-Century principles and techniques.

☐ **MUTH 312 19TH-CENTURY THEORY AND ANALYSIS/JAZZ MAJORS.** (3) (3 hours) (Prerequisites: MUTH 211 or MUJZ 261 AND MUJZ 161. Open only to Jazz Performance Majors) Expanded harmonic resources of the late 19th-Century (e.g., foreign modulation, chromatic harmony). Analysis of characteristic small and large forms. Development of writing and analytical skills with a goal toward perceiving how levels of musical structure interact. This course is oriented towards students with Jazz theoretical background.

☐ **MUTH 313 20TH-CENTURY THEORY AND ANALYSIS/JAZZ MAJORS.** (3) (3 hours) (Prerequisite: MUTH 312. Open only to Jazz Performance Majors) 20th-Century systems of musical organization (e.g., polytonality, modal systems, neo-classical tonality, serialism, linear counterpoint) and their relationship to earlier practices. Development of writing and analytical skills to gain insight into 20th-Century principles and techniques. This course is oriented towards students with Jazz theoretical background. Unless otherwise indicated the following courses are prerequisites to 300-, 400- and 500-level theory courses: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171.

● **MUTH 327 19TH-CENTURY ANALYSIS.** (4) (2 hours) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MUTH 327D1 19TH-CENTURY ANALYSIS. (2) (Students must also register for MUTH 327D2) (No credit will be given for this course unless both MUTH 327D1 and MUTH 327D2 are successfully completed in consecutive terms) (MUTH 327D1 and MUTH 327D2 together are equivalent to MUTH 327) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) The analysis of representative works of the 19th Century, selected from various genres of the period encompassed by late Beethoven, Schubert, and Berlioz to Mahler and Wolf. Some preliminary work in Schenkerian analysis will be undertaken.

MUTH 327D2 19TH-CENTURY ANALYSIS. (2) (Prerequisite: MUTH 327D1) (No credit will be given for this course unless both MUTH 327D1 and MUTH 327D2 are successfully completed in consecutive terms) (MUTH 327D1 and MUTH 327D2 together are equivalent to MUTH 327) See MUTH 327D1 for course description.

● □ **MUTH 426 ANALYSIS OF EARLY MUSIC.** (3) (3 hours) (Prerequisites: MUTH 211, MUHL 184)

MUTH 427D1 20TH-CENTURY ANALYSIS. (2) (2 hours) (Students must also register for MUTH 427D2) (No credit will be given for this course unless both MUTH 427D1 and MUTH 427D2 are successfully completed in consecutive terms) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) Analysis of a cross-section of 20th Century music from Debussy and Mahler to the present to: 1) provide analytical tools necessary for the understanding of pitch organization, form, rhythm, timbre, etc., in individual works; 2) introduce salient theoretical approaches pertaining to 20th Century music.

MUTH 427D2 20TH-CENTURY ANALYSIS. (2) (Prerequisite: MUTH 427D1) (No credit will be given for this course unless both MUTH 427D1 and MUTH 427D2 are successfully completed in consecutive terms) See MUTH 427D1 for course description.

MUTH 461 CHORAL AND KEYBOARD ARRANGING. (2) (2 hours) (Prerequisite: MUTH 311 OR permission of instructor) An introduction to arranging techniques, and their application in settings for keyboard and choral resources. Materials include folksongs, carols, popular and originally composed melodies. The emphasis is on creative arrangement as opposed to transcription.

MUTH 462 INSTRUMENTAL ARRANGING. (3) (2 hours) (Prerequisites: MUTH 461 AND MUIT 201, MUIT 202, MUIT 203 and MUIT 204 OR permission of instructor) The application of the general techniques studied in MUTH 461 to woodwind, brass and string ensembles, to various of which may be added keyboard, chorus, and percussion. Major assignments are prepared and recorded in workshops, and are subsequently discussed in class.

● **MUTH 473 SPECIAL STUDIES: 20TH-CENTURY THEORY AND COMPOSITION.** (3) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171)

● **MUTH 475 SPECIAL PROJECT.** (3) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171)

● **MUTH 475D1 SPECIAL PROJECT.** (1.5) (Students must also register for MUTH 475D2)

● **MUTH 475D2 SPECIAL PROJECT.** (1.5) (Prerequisite: MUTH 475D1)

□ **MUTH 502 THEORY REVIEW 2.** (3) (3 hours) (For incoming graduate students who, on the basis of placement tests, are deemed deficient in tonal theory and analysis; may not be taken by students enrolled in B.Mus. programs; may not be taken as elective in M.Mus. and M.A. programs) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) Analytical approaches to larger forms of 18th- and 19th-century repertoire, particularly sonata and other forms in solo, chamber, and orchestral genres. Various analytical methods are applied to the study of advanced chromatic vocabulary and syntax, and to large-scale tonal and formal design.

□ **MUTH 503 THEORY REVIEW 3.** (3) (3 hours) (For incoming graduate students who, on the basis of placement tests, are deemed deficient in post-tonal theory and analysis; may not be taken by students enrolled in B.Mus. programs; may not be taken as elective in M.Mus. and M.A. programs) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) Analytical approaches to 20th-century repertoire in extended tonal, atonal, twelve-tone, and later idioms. Analysis of pitch and pitch-class structure, and of rhythmic, timbral, and formal developments in 20th-century compositions.

● □ **MUTH 523D1 ADVANCED HARMONY.** (3) (3 hours) (Prerequisites: MUTH 304 and MUTH 327 OR MUCO 240) (Students must also register for MUTH 523D2)

● **MUTH 523D2 ADVANCED HARMONY.** (3) (Prerequisite: MUTH 523D1)

□ **MUTH 528 SCHENKERIAN TECHNIQUES.** (3) (3 hours) (Prerequisite: MUTH 310 or MUCO 240 OR Corequisite: MUTH 327 OR permission of instructor. Limited enrolment with preference given to students in Honours Theory) Introduction to the principles and techniques of Schenkerian analysis. Interpretation and construction of reductive graphs through the analysis of a diversified repertoire of tonal works. Comparison with traditional methods of harmonic analysis (Rameau, Riemann, etc.).

□ **MUTH 529 PROSEMINAR IN MUSIC THEORY 1.** (3) (3 hours) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) (Corequisites: MUTH 327 and MUHL 570 OR permission of instructor. Preference given to students in Honours Theory) A survey of various topics in contemporary music theory, including experimental aesthetics, indeterminacy, information theory, linguistics, microtonality, music technology, psycho-acoustics, and rhythmic theory.

□ **MUTH 538 MATHEMATICAL MODELS/MUSICAL ANALYSIS.** (3) (3 hours) (Prerequisites: MUTH 211 or MUCO 240 and MUSP 231 and MUSP 171) A survey of the theoretical and analytical writings from 1955 to the present, with emphasis on the following topics: a) atonal music (the works of Forte, Lewin, Rahn, Clough, Benjamin); b) twelve-tone music (Babbitt, Lewin, Mead); c) contour theory (Friedmann, West Marvin, Morris); and d) mathematical groups and transformational models (Lewin, Morris, Starr).

Faculty of Religious Studies

RELG – Religious Studies

Offered by: Faculty of Religious Studies
Former Teaching Unit Code: 260

RELG 201 RELIGIONS/ANCIENT NEAR EAST. (3) (Fall) Deities, death and rebirth in the religions of ancient Egypt, Mesopotamia and Canaan; myth and ritual with reference to the geographical, historical and cultural conditions which influenced religious expression.

RELG 202 RELIGION OF ANCIENT ISRAEL. (3) (Winter) (Not open to students who are required to take or have taken RELG 302) An examination of the religion of Ancient Israel by a study of selected

texts (narratives, laws, prophetic sayings, wisdom traditions, and psalms) from the Hebrew Scriptures/Old Testament in translation.

RELG 203 BIBLE AND WESTERN CULTURE. (3) (Fall/Winter) To provide students of the humanities with knowledge of the Bible as a tool for interpreting religious references in Western literature, art and music. Biblical stories (e.g. Creation, Exodus), key figures (e.g. David, Job, Mary), and common motifs (e.g. Holy City, Pilgrimage, Bride) are explored, then illustrated by later cultural forms.

RELG 204 JUDAISM, CHRISTIANITY AND ISLAM. (3) (Winter) An introduction to the beliefs, practices, and religious institutions of these three world religions.

RELG 207 THE STUDY OF WORLD RELIGIONS 1. (3) (Fall) An introduction to the study of Hinduism, Buddhism, Confucianism, Taoism, Judaism, Christianity, Islam and Primal Religions.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

RELG 210 JESUS OF NAZARETH. (3) (Fall) A critical study of selected ancient and modern accounts of the aims and person of Jesus. Attention will be given also to the question of the historical sources and to the relationship between faith and history.

RELG 232 EASTERN ORTHODOX MYSTICISM AND CONTEMPORARY LITERATURE. (3) (Winter) A survey of Eastern Orthodox mystical thought in 19th - 20th century authors studied against the background of early texts (in translation) of the Syro-Byzantine and Russian spiritual tradition and examined in light of modern literary-religious trends.

RELG 252 HINDUISM AND BUDDHISM. (3) (Fall) The interaction of Hinduism and Buddhism in India with special reference to the law of Karma, caste, women, ritual, death, yoga, and liberation. Determination of interpretative principles for understanding the religious psychology of Hindus and Buddhists.

RELG 253 RELIGIONS OF EAST ASIA. (3) (Winter) Harmony with nature, society, and cosmos to be explored through the religions of the Far East (Confucianism, Taoism, Buddhism and Shinto).

RELG 254 INTRODUCTION TO SIKHISM. (3) (Winter) An introduction to the historical and religious context in which the Sikh religion developed, its principal doctrines, practices and institutions and its evolution from its origins to the present, both inside and outside India.

RELG 256 WOMEN IN JUDAISM AND ISLAM. (3) (Winter) The role of women in Judaism and Islam from the point of view of institutionalized religious traditions and of women's religious subjectivity; how women's spiritual and social roles within their religious traditions are shaped by Revealed Law, Holy Text and the Authority of Interpretation. Comparative sociology of religion approach.

RELG 257D1 INTRODUCTORY SANSKRIT. (3) (Students must also register for RELG 257D2) (No credit will be given for this course unless both RELG 257D1 and RELG 257D2 are successfully completed in consecutive terms) To develop basic language and reading skills.

RELG 257D2 INTRODUCTORY SANSKRIT. (3) (Prerequisite: RELG 257D1) (No credit will be given for this course unless both RELG 257D1 and RELG 257D2 are successfully completed in consecutive terms) See RELG 257D1 for course description.

RELG 270 RELIGIOUS ETHICS AND THE ENVIRONMENT. (3) (Fall: Macdonald Campus. Winter: Downtown.) Survey of issues and debates in environmental ethics. The challenge posed to human and religious values by the present ecological crisis and some ethical and religious responses to this challenge, Native American spirituality, Eastern and African religions, ecofeminism and liberation theology will be discussed, as will recent environmental debates concerning technology and large scale development projects. Lectures supplemented by guest speakers and audiovisual presentations.

RELG 271 SEXUAL ETHICS. (3) (Fall and Winter) A study of the social construction of sexual identity and of selected issues regarding sexual behaviour.

RELG 280 ELEMENTARY NEW TESTAMENT GREEK. (6) (Summer)

RELG 280D1 ELEMENTARY NEW TESTAMENT GREEK. (3) (Students must also register for RELG 280D2) (No credit will be given for this course unless both RELG 280D1 and RELG 280D2 are successfully completed in consecutive terms) (RELG 280D1 and RELG 280D2 together are equivalent to RELG 280) An introduction to the grammar and syntax of New Testament Greek.

RELG 280D2 ELEMENTARY NEW TESTAMENT GREEK. (3) (Prerequisite: RELG 280D1) (No credit will be given for this course unless both RELG 280D1 and RELG 280D2 are successfully completed in consecutive terms) (RELG 280D1 and RELG 280D2 together are equivalent to RELG 280) See RELG 280D1 for course description.

RELG 285 THE GNOSTIC WORLDVIEW. (3) (Summer) On the basis of newly-discovered gnostic writings, forms of gnosticism will be studied in their relationship to Platonists, Jewish and Christian circles in the Graeco-Roman world. Attention to Manicheism, Mande-

ism and some medieval and modern representatives of the gnostic worldview.

★ **RELG 300 POST-BIBLICAL JEWISH TRADITION.** (3) (Fall) The origins of Rabbinic Judaism: a survey of Jewish history and thought from Ezra to the Tannaim; oral tradition; Torah interpretation in the Mishnah and Midrashim.

RELG 302 OLD TESTAMENT STUDIES 1. (3) (Fall) An introduction to the literature of Ancient Israel in English translation. Reading and interpreting representative selections.

RELG 303 LITERATURE OF ANCIENT ISRAEL 2. (3) (Winter) Approaches to historical-critical scholarship and to the historical background of the Old Testament. Part of the course will be an examination of methods of biblical analysis through the use of learning cells.

RELG 306 RABBINIC JUDAISM. (3) (Fall) (Prerequisite: RELG 202 or RELG 204 or permission of instructor) (Not open to students who have taken RELG 206) The beliefs, practices and religious institutions of the Jews from ancient times to the present.

● ★ **RELG 307 SCRIPTURAL INTERPRETATION.** (3) (Winter)

● **RELG 308 ANCIENT BIBLE TRANSLATIONS.** (3) (Prerequisites: One of RELG 202, 302 or JWST 211, 327, 328, 329, 330.)

RELG 311 NEW TESTAMENT STUDIES 1. (3) (Fall) An introduction to the interpretation of the New Testament.

RELG 312 NEW TESTAMENT STUDIES 2. (3) (Winter) An introduction to the critical study of the Gospels.

RELG 314 TOPICS IN BIBLICAL STUDIES. (3) (Summer)

RELG 315 SPECIAL TOPICS IN RELIGION. (3) (Fall, Winter and Summer) (Prerequisites: RELG 204 or RELG 252 or RELG 253) (Not open to students who have taken RELG 496.) January 2003. An interdisciplinary approach to the exploration of the meaning and practice of religion and technology in the 21st century. The focus will be on the complex and contradictory relationship between technology and religion. This course will critically evaluate the significance of this relationship for the future of both religion and technology.

RELG 322 THE CHURCH IN HISTORY 1. (3) (Fall) A survey of major developments in the history of Christianity from the end of the apostolic age to 1500. Selected readings from primary and secondary sources will be used.

RELG 323 THE CHURCH IN HISTORY 2. (3) (Winter) Significant events and persons in the history of western Christianity from 1500 - 1948 will be studied. Attention is focused on mainline denominations in Britain and continental Europe.

● **RELG 325 VARIETIES RELIGIOUS EXPERIENCE IN CHRISTIANITY.** (3)

★ **RELG 326 ANCIENT CHRISTIAN CHURCH AD54 - AD604.** (3) (Fall) (Not open to students who have taken RELG 322 or RELG 323) Significant persons and events from Nero's reign to the papacy of Gregory I. Attention to major Christian centres within the Roman Empire before Constantine, to the development of the Eastern Byzantine Church, and to the growth of the papacy in the West. Leading Christian theologians and thinkers will be studied.

RELG 328 TOPICS IN CHURCH HISTORY. (3) (Summer)

● **RELG 329 TOPICS: HISTORY OF CHRISTIANITY.** (3) (Summer)

RELG 330 REFORMED THEOLOGY. (3) (Fall) Selected topics illustrating the Reformers' theological agenda, with special reference to Luther, Zwingli and Calvin.

RELG 333 PRINCIPLES OF CHRISTIAN THEOLOGY 1. (3) (Winter) An introduction to the central categories of Christian theology. The course will include discussion of the nature of theology, and of all the primary areas of doctrine (Theology, Christology, Pneumatology, Anthropology, Ecclesiology, Eschatology). Throughout, a conscious attempt will be made to reflect on the Christian faith in the light of the contemporary apologetic situation.

RELG 334 THE CHRISTIAN FAITH. (3) (Fall) (Prerequisites: One of RELG 202, 204, 210, 302, 311, 312 or the equivalent.) A study of

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

core Christian ideas and their relation to doxology, morality, history and culture.

RELG 336 CONTEMPORARY THEOLOGICAL ISSUES. (3) (Fall, Winter and Summer) (Prerequisite: RELG 320 or RELG 338 or permission of instructor) (Topic for Fall 2003: The Lover, the Beloved and Love Itself: The Trinity and Art. Identifies key issues in major areas of trinitarian enquiry and explores the development of the trinitarian doctrine through art and the study of classical "texts". Discussions will include: the role of trinitarian images/imagery for engagement in theological discourse, the function of the trinitarian formula in the relationship between doctrine and liturgy/teaching and practice, the nature/scope of contemporary trinitarian dialogue, etc.) (Topic for Winter 2004: Women + God-Talk = Feminist Theology. Explores theological avenues traditionally ignored in religious studies through the works of contemporary Christian feminist theologians. Discussions focus on the methodologies, experiences and critiques of western, multi-cultural and international - Asian, African, Latin American-scholars. The works of a few Jewish and Moslem feminist scholars are also surveyed to examine similarities/differences in their focal areas of interest/concern.)

RELG 337 THEMES IN BUDDHIST STUDIES. (3) (Winter) (Prerequisite: RELG 252 or RELG 253 or permission of instructor) A focussed examination of major themes within a branch of Theravada, Mahayana or Vajrayana Buddhism. Emphasis will be placed on both the close study of primary texts (in translation) in historical context and the application of recent methods to fundamental Buddhist concepts, ritual practices and community institutions.

RELG 338 WOMEN AND THE CHRISTIAN TRADITION. (3) (Fall) (Core course for the Women's Studies Minor program) Survey of women's involvement in the Christian tradition. Topics include feminist interpretation of scripture, ideas of virginity, marriage and motherhood, mysticism, asceticisms, European witchhunts, contemporary women's liberation theories.

RELG 339 HINDU AND BUDDHIST IMAGES OF FEMINE. (3) (Winter and Summer) (Core course for the Women's Studies Minor program) An analysis of the richness (and ambivalence) of feminine imagery from three perspectives: mythic (goddesses, epic figures); philosophic (material nature, the power to create, wisdom, compassion); human (mothers, wives, daughters, temptresses, nuns).

RELG 340 RELIGION AND THE SCIENCES. (3) (Fall and Summer) Philosophies of science and of religion have created a more positive dialogue on questions of method, symbolism and rationality. Examines key issues (e.g. creation and evolution; objectivity and involvement; determinism and freedom) raised by natural and social sciences, and various possible solutions.

RELG 341 INTRODUCTION: PHILOSOPHY OF RELIGION. (3) (Fall) Introduction to the subject. Faith and reason, theistic arguments, values and destiny, the problem of evil, religious language.

★ **RELG 342 THERAVADA BUDDHIST LITERATURE.** (3) (Fall) (Prerequisite: RELG 252 or permission of instructor) The evolution of doctrines, practices and institutions explored through critical survey of Pali Canon (in translation), focusing on the dialogues of Gotama Buddha and his community during its first five centuries and on the historical accounts contained in the codes of monastic discipline.

RELG 344 MAHÁYÁNA BUDDHISM. (3) (Fall) The development of Buddhist sects examined through accounts of the first pan-Buddhist councils in India and an investigation of Mahayana through key sutras (in translation).

RELG 345 RELIGION AND THE ARTS. (3) (Winter and Summer) Myths and symbols approached through literary criticism to examine art forms as self-images, social critique and forms of ultimate concern: concentration on Western culture.

RELG 347 TOPICS IN RELIGION AND THE ARTS. (3) (Winter)

★ **RELG 348 CLASSICAL HINDUISM.** (3) (Winter) (Prerequisite: RELG 252 or permission of the instructor) The study of classical Hindu values in historical context with reference to the goals and stages of life, traditional Hindu laws, ethics (including biomedical

ethics), axiology and moral dilemmas in the Epics, gender differences, notions of orthodoxy, and the expansion of Hinduism.

RELG 350 BHAKTI HINDUISM. (3) (Fall) (Prerequisite: RELG 252 or permission of the instructor) Foundation of theism in the Upanisads, Epics, Gita and puranas; image worship and temple religion in the Agamas; Vaisnavism, Saivism, Saktism, and competition with Buddhism and Jainism; the relation of Bhakti and Tantra; interaction of Hinduism, Islam, and Sikhism.

★ **RELG 352 JAPANESE RELIGIONS.** (3) (Winter) (Prerequisite: RELG 253 or permission of instructor) A study of early Shinto mythology, Shinto-Buddhist syncretism, Neo-Confucianism and its influence upon the resurgence of Shinto during the Tokugawa period, folk religion and the New Religions.

RELG 354 CHINESE RELIGIONS. (3) (Winter) This course studies the Confucian classics, philosophical and religious Taoism, and Neo-Confucianism and also examines the syncretism between the Chinese religions and Indian Buddhism.

RELG 356 RELIGION AND SEXUALITY IN INDIA. (3) (Winter and Summer) Love and sexual desire have been exalted in Hinduism, which also stresses denial and withdrawal from worldly desire. This ambiguity will be explored through mythic uses of sexuality; dharma and sexual practice; women, goddesses and ritual sex; "in between sexes": alternate sexualities; divine and human bodies; and eroticism in literary and performing arts.

RELG 357D1 SANSKRIT 2. (3) (Prerequisite: RELG 257 or permission of the instructor) (Students must also register for RELG 357D2) (No credit will be given for this course unless both RELG 357D1 and RELG 357D2 are successfully completed in consecutive terms) Advanced grammar and vocabulary with readings in epic and similar texts.

RELG 357D2 SANSKRIT 2. (3) (Prerequisite: RELG 357D1) (No credit will be given for this course unless both RELG 357D1 and RELG 357D2 are successfully completed in consecutive terms) See RELG 357D1 for course description.

RELG 361 RELIGIOUS BEHAVIOUR. (3) (Winter) A study of the psychological origins of religion, of some aspects of the religious life (e.g. prayer, conversion, mystical experiences), and of some contemporary religious phenomena (e.g. marginal religious groups, the charismatic movement, glossolalia). The views of Freud and Jung are also considered.

RELG 370 HUMAN CONDITION. (3) (Winter) Explores social justice as a key aspect of religious reforms in the 20th century; social justice, liberation theology and the human rights movement; human rights in the scriptures of the major world religions; perspectives on religious liberty and conscientious objection; religious critiques of the human rights movement.

RELG 371 ETHICS OF VIOLENCE/NON-VIOLENCE. (3) (Winter) Forms of violence and the reaction of religious groups are assessed both for their effectiveness and for their fidelity to their professed beliefs. Different traditions, ranging from the wholesale adoption of violent methods (e.g. the Crusades) to repudiation (e.g. Gandhi; the Peace Churches).

RELG 372 HINDU GODDESSES. (3) (Fall) The mythology, theology, soteriology, history, ritual, and texts of the goddess-centred (Sakta) branches of Hinduism.

● **RELG 375 RELIGION AND SOCIETY.** (3) (Course restricted to U2 and U3 students)

RELG 376 RELIGIOUS ETHICS. (3) (Fall) A discussion of ethical theory will provide the background for an analysis of the relationship between religious world views and moral reason. Attention will be given to the way in which the dominant religious traditions view the exemplars of religious virtue, and to how the virtues exemplified are related to and justified by the faith tradition in which they operate.

RELG 377 RELIGIOUS CONTROVERSIES. (3) (Fall) A comparative survey of types and topics of argumentation developed in the literature of controversy. Texts discussed include disputations, missionary sermons and polemical treatises.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

RELG 381 ADVANCED NEW TESTAMENT GREEK. (3) (Fall) (Prerequisite: RELG 280 or equivalent, with a minimum grade of 70%) A review of grammar and syntax with an emphasis on rapid reading of sections chosen from different parts of the New Testament.

RELG 389 INTRODUCTION TO THE BAHAI FAITH. (3) (Fall) A study of the Bahá'í Faith with an emphasis on its sacred practices, philosophical principles, practical ethics, history (including historical precedents), administrative structure, sacred texts, and theology of others regions.

RELG 390D1 ELEMENTARY BIBLICAL HEBREW. (3) (Students must also register for RELG 390D2) (No credit will be given for this course unless both RELG 390D1 and RELG 390D2 are successfully completed in consecutive terms) An introduction to the grammar and syntax of Biblical Hebrew. Emphasis is placed on both the oral and the written language.

RELG 390D2 ELEMENTARY BIBLICAL HEBREW. (3) (Prerequisite: RELG 390D1) (No credit will be given for this course unless both RELG 390D1 and RELG 390D2 are successfully completed in consecutive terms) See RELG 390D1 for course description.

● ★ **RELG 399 CHRISTIAN SPIRITUALITY.** (3)

● **RELG 404 POST EXILIC BIBLICAL LITERATURE.** (3)

★ **RELG 407 THE WRITINGS.** (3) (Prerequisites: RELG 202, or RELG 302 and RELG 303, or equivalent) A study of Job with some attention to Proverbs and Ecclesiastes (in English translation).

RELG 408 THE PROPHETS. (3) (Fall) (Prerequisites: RELG 202, or RELG 302 and RELG 303) A study of significant texts selected from the prophetic tradition in the Old Testament.

RELG 411 NEW TESTAMENT EXEGESIS. (3) (Winter) (Prerequisites: RELG 311 and RELG 312) A seminar in exegesis on the basis of representative passages chosen from different parts of the New Testament in English.

RELG 420 CANADIAN CHURCH HISTORY. (3) (Winter) (Prerequisite: RELG 323) A survey of the major Christian traditions in Canada from the settlement of New France to the present. Lectures and seminars with use, where possible, of primary source materials.

★ **RELG 423 REFORMATION THOUGHT.** (3) (Fall) An examination of issues and persons in Europe and the British Isles that contributed to ecclesiastical and social change during the 16th and early 17th centuries.

RELG 434 PRINCIPLES OF CHRISTIAN THEOLOGY 2. (3) (Fall) (Prerequisite: RELG 333) This course is a continuation of RELG 333.

RELG 438 TOPICS IN JEWISH THEOLOGY. (3) (Winter) A topic in Jewish Theology will be studied from a variety of approaches, including historical sociological and phenomenological.

RELG 439 RELIGIOUS DIALOGUES. (3) (Winter) (Prerequisite: RELG 204 or RELG 207.) A comparative survey of the literature of Western religious dialogues, addressing the history and diversity of debates concerning religion. Texts to be discussed include dialogues by Plato, Cicero, Augustine, Boethius, Anselm, Cusanus, Leo Hebraeus, Erasmus, Thomas More, Jean Bodin, Leibniz and Hume.

RELG 442 PURE LAND BUDDHISM. (3) (Fall) (Prerequisite: RELG 252 and RELG 253, or RELG 342 or RELG 344, or permission of instructor) The concept of Buddha Countries and Pure Lands in Buddhism, the Western Pure Land of Amida (Jodokyo) and its basic scriptures, the Chinese Buddhist schools, the introduction to Japan and the foundation of the Pure Land school by Honen, the Pure Land School of Shinran and its development, and the other Pure Land related schools.

● **RELG 443 JAPANESE ESOTERIC BUDDHISM.** (3) (Prerequisites: RELG 252 and RELG 253, or RELG 342, or RELG 344)

★ **RELG 451 ZEN: MAXIMS AND METHODS.** (3) (Fall) (Prerequisites: RELG 252, RELG 342 or RELG 344, or permission of instructor) Through the reading of such key Zen writings as The Platform Sutra and selections from Zen Masters Chinul of Korea and Dōgen of Japan, an attempt will be made to relate Zen anecdote to meditative practice.

● **RELG 452 EAST ASIAN BUDDHISM.** (3) (Winter) (Prerequisite: RELG 253 or RELG 344)

● **RELG 454 MODERN HINDU THOUGHT.** (3) (Prerequisite: RELG 252) A study of the developments in religious thought with special reference to such thinkers as Ram Mohan Roy, Dayananda Saraswati, Ramakrishna, Vivekananda, Gandhi, Tilak, Aurobindo, and Radhakrishnan.

RELG 456 THEORIES OF RELIGION. (3) (Fall and Winter) (For Religious Studies Majors and Honours students or with permission of the Chair of the Religious Studies B.A. Committee) The history of the academic study of religion from its beginnings in the 19th century until the present. Key texts by figures such as Max Muller, Sigmund Freud, Emile Durkheim, Max Weber, Mircea Eliade, Claude Levi-Strauss and Clifford Geertz will be studied.

RELG 457D1 ADVANCED SANSKRIT. (3) (Prerequisite: RELG 357 or permission of instructor) (Students must also register for RELG 457D2) (No credit will be given for this course unless both RELG 457D1 and RELG 457D2 are successfully completed in consecutive terms) Critical reading of selected Sanskrit texts.

RELG 457D2 ADVANCED SANSKRIT. (3) (Prerequisite: RELG 457D1) (No credit will be given for this course unless both RELG 457D1 and RELG 457D2 are successfully completed in consecutive terms) See RELG 457D1 for course description.

RELG 470 THEOLOGICAL ETHICS. (3) (Winter) (Prerequisite: RELG 341 or RELG 333) A study of the biblical and theological foundations of Christian ethics, and the nature, application and relevance of the Christian norm.

RELG 479 CHRISTIANITY IN GLOBAL PERSPECTIVE. (3) (Winter) This course examines traditional Western Christianity, aiming at the theological integration in light of religious and cultural pluralism and with reference to issues of world wide concern (e.g. gender, ethnicity, poverty, work, environment).

RELG 482 EXEGESIS OF GREEK NEW TESTAMENT. (3) (Winter) (Prerequisite: RELG 381 or equivalent, and RELG 311, RELG 312) An intensive seminar in exegesis on the basis of representative passages chosen from different parts of the New Testament.

RELG 491 HEBREW TEXTS. (3) (Fall) Translation and exegesis of selected texts.

RELG 492 HEBREW TEXTS. (3) (Winter) Translation and exegesis of selected texts.

RELG 494 B.Th. HONOURS SEMINAR 1. (3) (Fall) (Prerequisite: permission of the Chair of the B.Th. Committee) Open to students in the final year of B.Th. Honours. Provides opportunity for advanced development of research interests and methods in the student's area of Honours specialization.

RELG 495 B.Th. HONOURS SEMINAR 2. (3) (Winter) (Prerequisite: RELG 494 and permission of the Chair of the B.Th. Committee) Open to students in the final year of B.Th. Honours. Provides further opportunity for advanced development of research interests and methods in the student's area of Honours specialization.

RELG 496 SPECIAL STUDIES. (3) (Fall and Winter)

RELG 497 RESEARCH SEMINAR. (3) (Fall and Winter) (Students wishing to take this course must have the permission of the Religious Studies Adviser)

RELG 498 SPECIAL STUDIES. (3) (Fall and Winter) (Prerequisite: permission of the Chair of the B.Th. Committee)

RELG 499 RESEARCH SEMINAR. (3) (Prerequisite: permission of the Chair of the B.Th. Committee)

RELG 500 METHODOLOGY COLLOQUIUM. (3)

● **RELG 501 HONOURS SEMINAR.** (3) (Summer)

RELG 520 BIBLICAL THEOLOGY. (3) (Fall and Winter) (Limited to S.T.M. students.) Tutorials and guided reading in the field of Biblical Theology.

RELG 530 CHURCH HISTORY. (3) (Fall and Winter) Limited to S.T.M. students. Tutorials and guided reading in the field of church history.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

RELG 531 CHRISTIAN THEOLOGY. (3) (Fall and Winter) Limited to S.T.M. students. Tutorials and guided reading in the field of Christian Theology.

● **RELG 532 HISTORY OF CHRISTIAN THOUGHT 1.** (3) (Prerequisite: At least six (6) credits at the 300-level in Christianity or the Christian Bible.) (Not open to students who have taken RELG 320)

● **RELG 533 HISTORY OF CHRISTIAN THOUGHT 2.** (3) (Prerequisite: At least six (6) credits at the 300-level in Christianity or the Christian Bible.) (Not open to students who have taken RELG 327)

RELG 540 PHILOSOPHY OF RELIGION. (3) (Winter) (Limited to S.T.M. students.) Tutorials and guided reading in the field of Philosophy of Religion.

● **RELG 541 THEOLOGICAL ETHICS.** (3) (Fall and Winter) (Limited to S.T.M. students.)

RELG 546 INDIAN PHILOSOPHY. (3) (Fall) (Prerequisites: 6 credits in Indian religions, philosophy of religion, philosophy, or permission of the instructor) Introduction to the orthodox systems of Hindu Philosophy leading up to Vedanta i.e. Nyaya, Vaisesika, Sankhya, Yoga and Mimamsa, which will include discussion of such topics as: grounds for belief and disbelief in God, the nature of revelation, means of knowledge, etc.

● **RELG 547 HINDU PHILOSOPHY 2.** (3) (Prerequisites: 6 credits in Indian religions, philosophy of religion, philosophy, or permission of the instructor)

● **RELG 548 INDIAN BUDDHIST PHILOSOPHY.** (3) (Prerequisites: RELG 252 or RELG 342 or permission of instructor)

● ★ **RELG 549 EAST ASIAN BUDDHIST PHILOSOPHY.** (3) (Prerequisites: RELG 253 and RELG 342 or RELG 344 or approval of instructor) A study of basic issues in Chinese and Japanese schools of Buddhist and Neo-Confucian philosophy through an examination of representatives texts and commentary.

RELG 550 COMPARATIVE RELIGION. (3) (Fall and Winter) (Limited to S.T.M. students.) Tutorials and guided reading in the field of Comparative Religion.

● **RELG 551 INDIAN LOGIC 1.** (3)

● **RELG 552 ADVAITA VEDANTA.** (3) (Fall) (Prerequisites: 6 credits in Indian religions)

RELG 553 RELIGIONS OF SOUTH INDIA 1. (3) (Winter) (Prerequisite: 6 credits in Indian religions) Topics include: definitions of Tamil identity, the relation of akam to bhakti poetry, the theology of the Alvars and Nayanmars, inter-religious and sectarian competition, the motif of pilgrimage, questions of caste and women.

RELG 555 HONOURS SEMINAR. (3) (Winter) (For Religious Studies Honours students or with permission of the Chair of the Religious Studies B.A. Committee) Current trends in the study of religion, including the approaches of critical theory, feminism, post-modernism, and post-colonialism.

RELG 556 ISSUES IN BUDDHIST STUDIES. (3) (Winter) (Prerequisite: permission of instructor) A graduate seminar taught by the Numata Visiting Professor on critical issues in contemporary Buddhist Studies. Emphasis will be placed on the intensive application of different methods - philological, philosophical or social scientific - to some area of modern Buddhist research.

RELG 557 ASIAN ETHICAL SYSTEMS. (3) (Fall) (Prerequisites: RELG 252, RELG 253, or permission of instructor) An examination of the ethical ideals that have evolved in Asia with reference to Hinduism, Buddhism, Confucianism, and Taoism. Issues to be explored include competing views of the individual's duties to social and political institutions, the individual's right to non-conformity, the relationship between morality and metaphysics, and a comparison of moral principles in theistic and atheistic contexts.

RELG 571 RELIGION AND MEDICINE. (3) (Winter) A study of the resources of major world religions (Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism and Shinto) for thinking about ethical issues related to modern medicine, e.g., health, illness, suffering; new reproductive technologies; genetic engineering; euthanasia; palliative care; animal research; transplants.

Faculty of Science

ANAT – Anatomy and Histology

Offered by: Department of Anatomy and Cell Biology
Former Teaching Unit Code: 504

Admission is guaranteed for all students enrolled in programs in the Department of Anatomy and Cell Biology for which the course in question is a required course.

ANAT 205 ASTROBIOLOGY. (3) (Winter) (3 hours lecture) (Not open to students who have taken or are taking EPSC 205) Astrobiology is the search for the origin, evolution and destiny of life in the universe. The course will provide insight into the formation and evolution of habitable worlds, the evolution of life and the biogeochemical cycles in the Earth's oceans and atmosphere, and the potential for biological evolution beyond an organism's planet of origin.

ANAT 212 MOLECULAR MECHANISMS OF CELL FUNCTION. (3) (Winter) (Prerequisite: BIOL 200) (This course is also listed as BIOC 212. Not open to students who have taken or are taking BIOC 212 or BIOL 201) An introductory course describing the biochemistry and molecular biology of selected key functions of animal cells, including: gene expression; mitochondrial production of metabolic energy; cellular communication with the extra-cellular environment; and regulation of cell division.

ANAT 214 SYSTEMIC HUMAN ANATOMY. (3) (Fall) (2 hours lectures, 2 hours practical tutorial) (Open to students in biological sciences) Introduction to the gross anatomy of the various organ systems of head, neck and trunk regions of the human body. Practical tutorials include studies of prepared specimens, use of the anatomical museum and audio-visual materials. This course is limited in size. Selection of students (other than those requiring the course as part

of their program) will be made after the first lecture. (Admission is guaranteed for all students enrolled in programs in the Department of Anatomy and Cell Biology for which ANAT 214 is a required course.

ANAT 261 INTRODUCTION TO DYNAMIC HISTOLOGY. (4) (Fall) (3 hours lectures, 2 hours laboratory) (Must be taken in U1 by students in Anatomy and Cell Biology programs) (Open to students in biological sciences and others by special permission) An introduction to light and electron microscopic anatomy in which cell and tissue dynamics will be explored in the principal tissues and organs of the body.

ANAT 262 INTRODUCTORY MOLECULAR AND CELL BIOLOGY. (3) (Winter) (3 hours lecture) (Corequisites: ANAT 212 or BIOC 212 or BIOL 201) (Open to students in biological sciences and others by special permission) The architectural, functional and temporal continuity of organelles and the cytoskeleton of mammalian cells is introduced as well as their functional integration in the phenomena of exocytosis, endocytosis, protein trafficking and cell motility and adhesion.

ANAT 315 REGIONAL ANATOMY/LIMBS AND BACK WITH DISSECTION. (4) (Fall) (2 hours lectures, 4 hours laboratory) (Open to students in Physical and Occupational Therapy; and to Honours students in Anatomy and Cell Biology, with permission of instructor.) A dissection course in regional human gross anatomy of the skeleton, joints, muscles and neurovascular structures of the limbs and back.

ANAT 316 HUMAN VISCERAL ANATOMY. (2) (Winter) (2 hour lecture, 2 hours laboratory) (Prerequisite: ANAT 315) (Open to students in Physical and Occupational Therapy, and to others by special permission) The gross anatomy of the various organ systems of the human body, with emphasis on those aspects of great

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

est relevance to physical and occupational therapists. Laboratories include studies of prepared specimens, use of the anatomical museum and audiovisual materials.

ANAT 321 CIRCUITRY OF THE HUMAN BRAIN. (3) (Fall) (2 hour lectures, 2 hours laboratory/tutorial) (Prerequisite: at least one 3-credit university level course in biology or psychology) This course explores the functional organization of the human brain and spinal cord. The course focuses on how neuronal systems are designed to subserve specific motor, sensory, and cognitive operations.

★ **ANAT 322 NEUROENDOCRINOLOGY.** (3) (Winter) (2 hours lectures, 1 hour conference) (Prerequisites: ANAT 261 and ANAT 321) A lecture course describing brain-endocrine relationships. Emphasis on modern experimental evidence and conceptual developments within the field.

● ★ **ANAT 365 CELL BIOLOGY: SECRETORY PROCESS.** (3) (Fall) (2 hours lectures, 2 hours conference) (Prerequisites: ANAT 261, BIOL 200, BIOL 201)

★ **ANAT 381 EXPERIMENTAL BASIS OF EMBRYOLOGY.** (3) (Winter) (2 hours lectures, 2 hours laboratory or conference) (Prerequisites: ANAT 214, ANAT 261, or by special permission) This course will focus on the function of cell adhesion molecules as morphogenetic regulators. Modern techniques of molecular embryology will be discussed.

ANAT 432 RESEARCH PROJECT: ANATOMICAL SCIENCE. (9) (Fall, Winter, or Summer) (For students in the Honours program. The course may also be taken, with special permission, by students in Anatomy Major and Faculty programs as well as by students of other Departments.) An intensive exposure to individually supervised, original research in anatomical sciences. A variety of methods, including electron microscopy, cytochemistry, immunolabeling, radioautography, and cell fractionation and biochemical analysis are applied to basic problems in cell biology. A substantial written report, followed by an oral presentation and defence are required. Students should consult the course coordinators several weeks before registration.

Also offered as:

ANAT 432D1 RESEARCH PROJECT: ANATOMICAL SCIENCE. (4.5) (Fall) (Students must also register for ANAT 432D2)

ANAT 432D2 RESEARCH PROJECT: ANATOMICAL SCIENCE. (4.5) (Winter) (Prerequisite: ANAT 432D1)

ANAT 458 MEMBRANES AND CELLULAR SIGNALING. (3) (Winter) (3 hours lectures) (Prerequisites: BIOC 212 or ANAT 212 or BIOL 201, ANAT 262, one of PHGY 201, PHGY 209 or BIOL 205; one of BIOL 312 or ANAT 365; BIOC 311 recommended) (This course is also listed as BIOC 458. Not open to students who are taking or who have taken BIOC 458) An integrated treatment of the properties of biological membranes and of intracellular signaling, including the major role that membranes play in transducing and integrating cellular regulatory signals. Biological membrane organization and dynamics; membrane transport; membrane receptors and their associated effectors; mechanisms of regulation of cell growth, morphology, differentiation and death.

ANAT 541 CELL AND MOLECULAR BIOLOGY OF AGING. (3) (Winter) (2 hours lecture, 2 hours conference) (Prerequisites: ANAT 261, ANAT 262, or by special permission) This course will focus on how the complex aging process can be studied by modern cell and molecular approaches. Topics will include discussion on animal model systems for aging, gene regulation controlling the aging process and age-dependent diseases.

ATOC – Atmospheric and Oceanic Sciences

Offered by: Department of Atmospheric and Oceanic Sciences
Former Teaching Unit Code: 195

● **ATOC 199 FYS: WEATHER, CLIMATE, HISTORY.** (3) (Winter) (2 hours lectures; 1 hour seminar) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them) (Maximum 25)

ATOC 210 INTRODUCTION TO ATMOSPHERIC SCIENCE. (3) (Fall and Winter) (3 hours lectures) (Open to all students except those who have taken ATOC 214) A survey of the Earth's atmosphere, weather and climate system. Topics include the fundamental processes that determine interactions between the atmosphere, ocean and biosphere; anthropogenic effects such as global warming, the ozone hole and acid rain; a perspective on future climate change.

ATOC 214 INTRODUCTION: PHYSICS OF THE ATMOSPHERE. (3) (Fall) (3 hours lectures) (Prerequisite: CEGEP Physics) An introduction to physical meteorology designed for students in the physical sciences. Topics include: composition of the atmosphere; heat transfer; the upper atmosphere; atmospheric optics; formation of clouds and precipitation; instability; adiabatic charts.

ATOC 215 WEATHER SYSTEMS AND CLIMATE. (3) (Winter) (3 hours lectures) (Prerequisite: CEGEP Physics or permission of the instructor) Laws of motion, geostrophic wind, gradient wind. Surface and upper-level charts. Local wind systems, global wind systems. Air masses, fronts and middle latitude cyclones. Thunderstorms, tornadoes and hurricanes. Global climate, climate change. Weather on the "web".

★ **ATOC 219 INTRODUCTION TO ATMOSPHERIC CHEMISTRY.** (3) (Winter) (3 hours lectures) (Prerequisite: CEGEP DEC in Science or permission of instructor) (Not open to students who have taken CHEM 219, CHEM 419 or ATOC 419) (Offered in odd years. Students should register in CHEM 219 in even years) An introduction to the basic topics in atmospheric chemistry. The fundamentals of the chemical composition of the atmosphere and its chemical reactions. Selected topics such as smog chamber, acid rain, and ozone hole will be examined.

ATOC 220 INTRODUCTION TO OCEANIC SCIENCES. (3) (Fall and Winter) (3 hours lectures) (Not open to students who have taken EPSC 360 or EPSC 560) Air-sea interaction; oceanic properties; global climate change, carbon cycle; polar oceans, sea ice, polynyas; El Niño; remote sensing of oceans; physical control of biological processes in the sea.

ATOC 250 NATURAL DISASTERS. (3) (Fall) (3 hours lectures) (Not open to students who have taken or are taking EPSC 250) This course examines the science behind different types of disasters and our ability or inability to control and predict such events. From this course the student will gain an appreciation of natural disasters beyond the newspaper headlines, and will better understand how the effects of disasters can be reduced.

ATOC 308 PRINCIPLES OF REMOTE SENSING. (3) (Fall) (3 hours lectures) (Not open to students who have taken or are taking GEOG 308) A conceptual view of remote sensing and the underlying physical principles are presented. Ground-based and satellite systems and various components of the acoustic and electromagnetic spectrum - from visible to microwave - are discussed. Substantial emphasis is devoted to the application of remote sensed data in geography and atmospheric sciences.

ATOC 310 PHYSICAL OCEANOGRAPHY. (3) (Winter) (3 hours lectures) (Prerequisite: ATOC 220, MATH 141 or equivalent. Not open to students who have taken EPSC 360) Wind driven and thermohaline ocean circulations, surface and internal waves, and tidal phenomena. Use of remote sensing techniques in oceanography. Applications of physical oceanography to other fields of ocean research.

ATOC 315 WATER IN THE ATMOSPHERE. (3) (Fall and Winter) (3 hours lectures) (Prerequisite: ATOC 214) Global distribution of

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

water in the atmosphere. Moist processes. Global and mesoscale precipitation systems. Quantitative forecasting of precipitation. Extreme precipitation events. Large-scale influences. Precipitation modification.

● **ATOC 330 PHYSICAL METEOROLOGY.** (3) (Fall) (3 hours lectures) (Prerequisite: ATOC 214 OR permission of instructor. Not open to students who have taken ATOC 320 and ATOC 321)

● **ATOC 400D1 INDEPENDENT STUDY OF AN ENVIRONMENTAL PROBLEM.** (1.5) (Restricted to students taking a joint program in Atmospheric and Environmental Science or with permission of Department) (Students must also register for ATOC 400D2)

● **ATOC 400D2 INDEPENDENT STUDY OF AN ENVIRONMENTAL PROBLEM.** (1.5) (Prerequisite: ATOC 400D1)

ATOC 402 ATMOSPHERE-OCEAN TRANSPORTS. (3) (Fall) (3 hours lectures) (Prerequisite: MATH 222) The role of the atmosphere and oceans in redistributing chemical, physical and biological quantities such as heat, nutrients and pollutants. Overview of flow regimes, from global to turbulence scales, advection and diffusion processes; Reynolds averaging and turbulence; the effect of the Earth's rotation, stratospheric transport of pollutants, oceanic CO₂ transports.

ATOC 414 APPLICATIONS OF REMOTE SENSING. (3) (Winter) (3 hours lectures) (Prerequisite: ATOC 308 or GEOG 308) A more quantitative version of some topics covered in ATOC 308 with emphasis on the contribution of remote sensing to atmospheric and oceanic sciences. Basic notions of radiative transfer and applications of satellite and radar data to mesoscale and synoptic-scale systems are discussed.

● ★ **ATOC 419 ADVANCES IN CHEMISTRY OF ATMOSPHERE.** (3) (Winter) (3 hours lectures) (Prerequisites: CHEM 213, CHEM 273, MATH 222 and MATH 315 or equivalents, or permission of instructor) (Not open to students who have taken CHEM 419, CHEM 619, and ATOC 619) (Offered in odd years. Students should register in CHEM 419 in even years)

ATOC 480 HONOURS RESEARCH PROJECT. (3) (Restricted to U3 Honours students) The student will carry out a research project under the supervision of a member of the staff. The student will be expected to write a report and present a seminar on the work.

ATOC 512 ATMOSPHERIC AND OCEANIC DYNAMICS. (3) (Fall) (3 hours lectures) (Prerequisite: Permission of instructor) Introduction to the fluid dynamics of large-scale flows of the atmosphere and oceans. Stratification of atmosphere and oceans. Equations of state, thermodynamics and momentum. Kinematics, circulation, and vorticity. Hydrostatic and quasi-geostrophic flows. Brief introduction to wave motions, flow over topography, Ekman boundary layers, turbulence.

ATOC 513 WAVES AND STABILITY. (3) (Winter) (3 hours lectures) (Prerequisite: Permission of instructor) Linear theory of waves in rotating and stratified media. Geostrophic adjustment and model initialization. Wave propagation in slowly varying media. Mountain waves; waves in shear flows. Barotropic, baroclinic, symmetric, and Kelvin-Helmholtz instability. Wave-mean flow interaction. Equatorially trapped waves.

ATOC 515 TURBULENCE IN ATMOSPHERE AND OCEANS. (3) (3 hours lectures) (Prerequisite: ATOC 512 or permission of instructor) Application of statistical and semi-empirical methods to the study of geophysical turbulence. Reynolds' equations, dimensional analysis, and similarity. The surface and planetary boundary layers. Oceanic mixed layer. Theories of isotropic two- and three-dimensional turbulence: energy and enstrophy inertial ranges. Beta turbulence.

ATOC 530 CLIMATE DYNAMICS 1. (3) (Fall) (3 hours lectures) (Prerequisite: Permission of instructor) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Introduction to the components of the climate system. Review of paleoclimates. Physical processes and models of climate and climate change.

ATOC 531 CLIMATE DYNAMICS 2. (3) (Winter) (3 hours lectures) (Prerequisite: Permission of instructor) (Restricted to Graduate stu-

dents and final-year Honours Atmospheric Science students. Others by special permission.) The general circulation of the atmosphere and oceans. Atmospheric and oceanic general circulation models. Observations and models of the El Niño and Southern Oscillation phenomena.

ATOC 540 SYNOPTIC METEOROLOGY 1. (3) (Fall) (2 hours lectures; 2 hours laboratory) (Prerequisite: Permission of instructor) Analysis of current meteorological data. Description of a geostrophic, hydrostatic atmosphere. Ageostrophic circulations and hydrostatic instabilities. Kinematic and thermodynamic methods of computing vertical motions. Tropical and extratropical condensation rates. Barotropic and equivalent barotropic atmospheres.

ATOC 541 SYNOPTIC METEOROLOGY 2. (3) (Winter) (2 hours lectures; 2 hours laboratory) (Prerequisite: ATOC 512 and ATOC 540 or permission of instructor) Analysis of current meteorological data. Quasi-geostrophic theory, including the omega equation, as it relates to extratropical cyclone and anticyclone development. Frontogenesis and frontal circulations in the lower and upper troposphere. Cumulus convection and its relationship to tropical and extratropical circulations. Diagnostic case study work.

ATOC 546 CURRENT WEATHER DISCUSSION. (1) (Winter) (2 hours) (Prerequisite: ATOC 540 or permission of instructor) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Half-hour briefing on atmospheric general circulation and current weather around the world using satellite data, radar observations, conventional weather maps, and analyses and forecasts produced by computer techniques.

ATOC 550 SPECIAL TOPICS METEOROLOGY AND OCEANOGRAPHY. (1) (Fall) (1 hour lecture) (Prerequisite: Permission of instructor) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Lectures and seminars on special topics such as hydrology, agricultural meteorology, the limits of predictability, planetary atmospheres, atmospheric and oceanic pollution, coastal currents, and research reviews.

● **ATOC 558 NUMERICAL METHODS AND LABORATORY.** (3) (Winter) (1 hour lecture; 4 hours laboratory) (Prerequisite: Permission of instructor) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.)

ATOC 568 OCEAN PHYSICS. (3) (Winter) (3 hours lectures) (Prerequisite: ATOC 512 or permission of instructor) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Research methods in physical oceanography including data analysis and literature review. Course will be divided into five separate modules focussing on temperature-salinity patterns, ocean circulation, boundary layers, wave phenomena and tides.

BIOC – Biochemistry

Offered by: Department of Biochemistry
Former Teaching Unit Code: 507

BIOC 212 MOLECULAR MECHANISMS OF CELL FUNCTION. (3) (Winter) (Prerequisite: BIOL 200) (A non-terminal course intended to be followed by BIOC 311; BIOC 312 in the U2 year. Not open to students who have taken or are taking BIOL 201 or ANAT 212) An introductory course describing the biochemistry and molecular biology of selected key functions of animal cells, including: gene expression; mitochondrial production of metabolic energy; cellular communication with the extra-cellular environment; and regulation of cell division.

BIOC 300D1 LABORATORY IN BIOCHEMISTRY. (3) (Fall) (1 lecture and one 6-hour lab per week) (Prerequisites: BIOL 200 and BIOL 201 or BIOC 212, CHEM 222; CHEM 257D1/CHEM 257D2 recommended. Corequisites: BIOC 311 and BIOC 312. Not open to students who have taken or are taking BIOL 301.) (For students in Biochemistry programs, others with permission of instructor) (Students must also register for BIOC 300D2) (No credit will be given

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

for this course unless both BIOC 300D1 and BIOC 300D2 are successfully completed in consecutive terms) A comprehensive course in modern biochemical techniques involving properties of enzymes, metabolism, fractionation of organelles from mammalian cells and molecular biology.

BIOC 300D2 LABORATORY IN BIOCHEMISTRY. (3) (Winter) (Prerequisite: BIOC 300D1) (No credit will be given for this course unless both BIOC 300D1 and BIOC 300D2 are successfully completed in consecutive terms) See BIOC 300D1 for course description.

BIOC 311 METABOLIC BIOCHEMISTRY. (3) (Fall) (Prerequisites: BIOL 200, BIOL 201 or BIOC 212, CHEM 222) The generation of metabolic energy in higher organisms with an emphasis on its regulation at the molecular, cellular and organ level. Chemical concepts and mechanisms of enzymatic catalysis are also emphasized. Included: selected topics in carbohydrate, lipid and nitrogen metabolism; complex lipid and biological membranes; hormonal signal transduction.

BIOC 312 BIOCHEMISTRY OF MACROMOLECULES. (3) (Winter) (Prerequisites: BIOC 311, BIOL 200, BIOL 201 or BIOC 212) Gene expression from the start of transcription to the synthesis of proteins, their modifications and degradation. Topics covered: purine and pyrimidine metabolism; transcription and its regulation; mRNA processing; translation; targeting of proteins to specific cellular sites; protein glycosylation; protein phosphorylation; protein turnover; programmed cell death (apoptosis).

BIOC 404 BIOPHYSICAL CHEMISTRY. (3) (Winter) (Prerequisites: CHEM 204, CHEM 214 or equivalent) (Not open to students who have taken 180-404) Hydrodynamic and electrophoretic methods for separation and characterization of macromolecules. Optical and magnetic resonance spectroscopy of biopolymers, and applications to biological systems.

BIOC 450 PROTEIN STRUCTURE AND FUNCTION. (3) (Fall) (Prerequisites: BIOC 311, BIOC 312 and/or sufficient organic chemistry. Intended primarily for students at the U3 level) Primary, secondary, tertiary and quaternary structure of enzymes. Active site mapping and site-specific mutagenesis of enzymes. Enzyme kinetics and mechanisms of catalysis. Multienzyme complexes.

BIOC 454 NUCLEIC ACIDS. (3) (Fall) (Prerequisites: BIOC 311, BIOC 312 or permission of instructor) Chemistry of RNA and DNA, transcription and splicing of RNA and their control; enzymology of DNA replication. Special topics on transgenics, genetic diseases and cancer.

BIOC 455 NEUROCHEMISTRY. (3) (Winter) (Prerequisites: BIOC 311, BIOC 312 or permission of instructor) Covers biochemical mechanisms underlying central nervous system function. Introduces basic neuroanatomy, CNS cell types and morphology, neuronal excitability, chemically mediated transmission, glial function. Biochemistry of specific neurotransmitters, endocrine effects on brain, brain energy metabolism and cerebral ischemia (stroke). With examples, where relevant, of biochemical processes disrupted in human CNS disease.

BIOC 458 MEMBRANES AND CELLULAR SIGNALING. (3) (Winter) (Prerequisites: BIOC 212, ANAT 262; one of PHGY 201, PHGY 209 or BIOL 205; one of BIOC 312 or ANAT 365; and BIOC 311 or permission of instructors) (This course is also listed as ANAT 458. Not open to students who have taken or are taking ANAT 458 or BIOC 456) An integrated treatment of the properties of biological membranes and of intracellular signaling, including the major role that membranes play in transducing and integrating cellular regulatory signals. Biological membrane organization and dynamics: membrane transport; membrane receptors and their associated effectors; mechanisms of regulation of cell growth, morphology, differentiation and death.

BIOC 460 ADVANCED LAB IN BIOCHEMISTRY. (6) (Fall) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) Students will select one project, employing advanced as well as standard biochemical techniques, to be performed in a research laboratory in the Department. Each student will also write a research-review paper with the advice

of a professor and perform student projects in the teaching laboratory.

BIOC 491 INDEPENDENT RESEARCH. (6) (Winter) (Registration by departmental permission only) (Prerequisite: BIOC 460) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) Individual work on a project to be performed in a research laboratory.

BIOC 503 IMMUNOCHEMISTRY. (3) (Winter) (Prerequisites: BIOC 311, BIOC 312) This course, presented in lecture format, emphasizes the molecular, genetic and structure function events that occur in the humoral immune response. Interleukins and other mediators of inflammation, a field in which rapid changes are occurring, are discussed. The clinical significance of fundamental biochemical findings is described.

BIOL – Biology (Sci)

Offered by: Department of Biology
Former Teaching Unit Code: 177

Courses open to non-biologists Since many aspects of biology interest humanists and scientists specializing in other disciplines, several courses are offered to students with little or no background in biology. These are either CEGEP-equivalent courses (BIOL 111 and BIOL 112), service courses (BIOL 373), or general interest courses such as BIOL 115 and BIOL 210.

BIOL 101 ORGANISMAL BIOLOGY LABORATORY. (1) (Fall) (3 hours laboratory) (Exclusion: BIOL 111) Laboratory component of BIOL 111. May be taken only by transfer students who have completed elsewhere the lecture component but not the laboratory of BIOL 111 and only with permission of the Associate Dean (Academic and Student Affairs) of Science.

BIOL 102 CELL AND MOLECULAR BIOLOGY METHODS. (1) (Winter) (3.5 hours laboratory) (Exclusion: BIOL 112) The laboratory component of BIOL 112. May be taken only by transfer students who have completed elsewhere the lecture component but not the laboratory of BIOL 112 and only with permission of the Associate Dean (Academic and Student Affairs) of Science.

BIOL 111 PRINCIPLES: ORGANISMAL BIOLOGY. (3) (Fall) (2 lectures and 3 hours laboratory) (Prerequisite: none. Exclusions: CEGEP objective 00UK or equivalent; BIOL 115) (May require departmental approval.) An introduction to the structure, function and adaptation of plants and animals in the biosphere. Open to all students wishing introductory biology. Attendance at first lab is mandatory to confirm registration in the course.

BIOL 112 CELL AND MOLECULAR BIOLOGY. (3) (Winter) (2 lectures and 3.5 hours laboratory/seminar) (Prerequisite: none. Exclusions: CEGEP objective 00XU or equivalent; BIOL 115) (May require departmental approval.) The cell: ultrastructure, division, chemical constituents and reactions. Bioenergetics: photosynthesis and respiration. Principles of genetics and the molecular basis of inheritance. Serves as a prerequisite for BIOL 200 and BIOL 201 and as an alternative to CEGEP Cell Biology. Attendance at first lab is mandatory to confirm registration in the course.

BIOL 115 ESSENTIAL BIOLOGY. (3) (Winter) (3 lectures) (Prerequisites: none. Restricted to non-Science students; not open to students who have had BIOL 111, BIOL 112, or equivalents) An introduction to biological science that emphasizes the manner in which scientific understanding is achieved and evolves and the influence of biological science on society. Topics will include cell structure and function, genetics, evolution, organ physiology, ecology and certain special topics that change from year to year.

BIOL 200 MOLECULAR BIOLOGY. (3) (Fall) (3 lectures, 1 hour optional tutorial) (Prerequisite: BIOL 112 or equivalent. Corequisite: CHEM 212 or equivalent) The physical and chemical properties of the cell and its components in relation to their structure and function. Topics include: protein structure, enzymes and enzyme kinetics; nucleic acid replication, transcription and translation; the

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

genetic code, mutation, recombination, and regulation of gene expression.

BIOL 201 CELL BIOLOGY AND METABOLISM. (3) (Winter) ((3 lectures, 1 hour optional tutorial)) (Prerequisite: BIOL 200. Exclusion: BIOC 212 and ANAT 212) This course introduces the student to our modern understanding of cells and how they work. Major topics to be covered include: photosynthesis energy metabolism and metabolic integration; plasma membrane including secretion, endocytosis and contact mediated interactions between cells; cytoskeleton including cell and organelle movement; the nervous system; hormone signalling; the cell cycle.

BIOL 202 BASIC GENETICS. (3) (Winter) ((3 lectures, 1 hour optional tutorial)) (Prerequisite: BIOL 200. Exclusion 177-274) Introduction to basic principles, and to modern advances, problems and applications in the genetics of higher and lower organisms with examples representative of the biological sciences.

BIOL 205 BIOLOGY OF ORGANISMS. (3) (Winter) (3 hours lecture, optional conference hour) (Prerequisites: BIOL 200 or permission. Corequisite: BIOL 201 or BIOC 212.) Unified view of form and function in organisms from all five kingdoms. Focus on the principal functions that all organisms must achieve to ensure their survival.

BIOL 206 METHODS IN BIOLOGY OF ORGANISMS. (3) (Fall) (1 lecture and 4 hours laboratory) (Prerequisite: BIOL 111 or equivalent) Introduction to methods used in organismal biology, including ecological sampling, use of keys, measurements, use of statistics and computers in numerical analysis, microbiological methods, basic histological techniques, use of microscopes and library searching procedures. Lecture and Field trip in week one.

BIOL 208 INTRODUCTION TO ECOLOGY. (3) (Fall) (3 hours lecture, 1 hour tutorial) (Prerequisite: BIOL 111 or CEGEP equivalent) This course introduces the basic principles and applications of population, community, and ecosystem ecology.

BIOL 210 PERSPECTIVES OF SCIENCE. (3) (Fall) (3 hours lecture) This course is an introduction to the thinking, language and practices of scientists. Its objective is to bridge the gap between science and the humanities, and in particular to allow students enrolled in the Minor Concentration in Science for Arts to pursue their interests in specific scientific disciplines.

BIOL 240 MONTEREGIAN FLORA. (3) (Summer) (Prerequisite: BIOL 111 or permission) (Not open to students who have taken BIOL 358 or PLNT 358) (Contact instructor well in advance for specific dates (martin.lechowicz@mcgill.ca)) Field studies emphasizing sight-recognition of ferns, fern allies, conifers and flowering plants of the St. Lawrence River Valley, and the use of plant keys for species identification. Taught for two weeks at the Gault Nature Reserve; contact instructor well in advance for specific dates, logistics.

BIOL 300 MOLECULAR BIOLOGY OF THE GENE. (3) (Fall) (3 hours lecture, optional conferences) (Prerequisites: BIOL 200, BIOL 201) A survey of current knowledge and approaches in the area of gene structure and function. Topics include: gene isolation and characterisation, gene structure and replication, mechanism of gene expression and its regulation in pro- and eukaryotes.

BIOL 301 CELL AND MOLECULAR LABORATORY. (4) (Fall or Winter) (1 lecture and one 6-hour laboratory) (Prerequisites: BIOL 200, BIOL 201. BIOL 206 recommended. Exclusion: BIOC 300.) (Requires departmental approval.) A practical introduction to laboratory techniques. Focus is on the experimental methods used to develop fundamental biological principles. Techniques involving enzyme characterization, DNA isolation and manipulation and genetic analysis are covered. metabolism and regulation of cell systems are analyzed and by which biological macro-molecules are purified and characterized.

BIOL 303 DEVELOPMENTAL BIOLOGY. (3) (Winter) ((3 lectures, 1 hour optional tutorial)) (Prerequisites: BIOL 200 and BIOL 201. Corequisite: BIOL 202) A consideration of the fundamental processes and principles operating during embryogenesis. Experimental analyses at the molecular, cellular, and organismal levels will be presented and analyzed to provide an overall appreciation of developmental phenomena.

BIOL 304 EVOLUTION. (3) (Fall) (3 hours lecture) (Prerequisite: BIOL 205 or BIOL 208/308 or ENVR 202) This course will show how the theory of evolution by natural selection provides the basis for understanding the whole of biology. The first half of the course describes the process of selection, while the second deals with evolution in the long term.

BIOL 305 DIVERSITY OF LIFE. (3) (Winter) (2 lectures and 1 three-hour laboratory) (Prerequisite: BIOL 205 or BIOL 208 or ENVR 202) This course will describe biological diversity in phylogenetic and ecological contexts, in populations and ecosystems, and from local to global scales. The practical classes will cover the relevant phylogenetic, ecological and statistical techniques needed to measure and analyze biodiversity.

BIOL 306 NEUROBIOLOGY AND BEHAVIOUR. (3) (Fall) (3 hours lecture) (Prerequisites: BIOL 201, BIOL 205) Mechanisms of animal behaviour; ethology; cellular neurophysiology, integrative networks within nervous systems; neural control of movement; processing of sensory information.

BIOL 307 BEHAVIOURAL ECOLOGY/SOCIOBIOLOGY. (3) (Winter) (2 hours lecture and 1 hour conference) (Prerequisites: BIOL 205, BIOL 208 or permission) The relationship between animal behaviour and the natural environment in which it occurs. This course introduces the subject of ecology at the level of the individual organism. Emphasis on general principles which relate to feeding, predator avoidance, aggression, reproduction and parental care of animals including humans.

BIOL 309 MATHEMATICAL MODELS IN BIOLOGY. (3) (Fall) (3 hours lecture) (Prerequisite: Elementary calculus. An additional course in calculus is recommended) Application of finite difference and differential equations to problems in cell and developmental biology, ecology and physiology. Qualitative, quantitative and graphical techniques are used to analyze mathematical models and to compare theoretical predictions with experimental data.

BIOL 313 STRUCTURE AND FUNCTION OF CELLS. (3) (Winter) (3 lectures, 1 hour optional tutorial) (Prerequisites: BIOL 200, BIOL 201 or ANAT/BIOC 212; and BIOL 202.) The functional organization of prokaryotic and eukaryotic cells.

BIOL 314 MOLECULAR BIOLOGY OF ONCOGENES. (3) (Fall) (3 hours lecture per week) (Prerequisites: BIOL 200; BIOL 201 or BIOC 212) The genes that cause cancer are altered versions of genes present in normal cells. The origins of these oncogenes, their genetic structure, regulation, and the biochemical properties of the oncogene-encoded proteins will be analyzed in an attempt to understand the origins of human and animal cancers.

● ★ **BIOL 324 ECOLOGICAL GENETICS.** (3) (Fall) (2 hours lecture, 1 seminar) (Prerequisite: BIOL 202)

BIOL 327 HERPETOLOGY. (3) (Fall) (2 hours lecture; 3 hours laboratory) (Prerequisite: BIOL 205) Principles of biology as exemplified by amphibians and reptiles. Topics include: adaptation, social behaviour, reproductive strategies, physiology, biomechanics, ecology, biogeography and evolution. Laboratories will emphasize structure, systematics and identification of local and world herpetofauna as well as field methods.

BIOL 328 BIOLOGICAL DIVERSITY IN AFRICA. (3) (7 hours lecture, 5 hours project.) (Prerequisite: BIOL 205 or permission of instructor. Corequisite: NRSC 300.) (Restriction: Students must be enrolled in the African Field Study Semester.) Biological diversity as exemplified by a particular taxonomic group chosen by the instructor, using field setting in East Africa to impart training in species identification, field research, and principles embodied in the phylogeny, systematics, biogeography, ecology, physiology and/or behaviour of the organisms concerned.

BIOL 331 ECOLOGY/BEHAVIOUR FIELD COURSE. (3) (Fall) (Prerequisites: BIOL 206; BIOL 208) (Preregistration in March and April. See Prof. Lechowicz) A 12-day Field Course just before the fall term, with a project report to be prepared early in the fall term. Methods of sampling natural populations of animal and plant species in fresh water and terrestrial habitats. Estimating population

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

size. Testing hypotheses in nature. Energy flow determinations and behavioural ecology.

BIOL 334 APPLIED TROPICAL ECOLOGY. (3) (Winter) (Prerequisites: BIOL 208 and permission) Relevant to agriculture, forestry, fisheries and conservation of natural resources. Field component taught at the University's Bellairs Research Institute in Barbados, for two weeks in early May. The course is organized in a series of small-group field projects of 2-3 days each. Interested students should contact the Undergraduate Office and fill out an application form.

BIOL 335 MARINE MAMMALS. (3) (Summer) (Prerequisite: BIOL 205) Biology of marine mammals with special emphasis on seals and whales of the Bay of Fundy. Taught at the Huntsman Marine Science Centre, St. Andrews, N.B., for three weeks in August. The course combines lectures, laboratory exercises, field trips, and individual projects. See S. Gabe, W4/8.

● **BIOL 341 HISTORY OF LIFE.** (3) (Winter) (3 hours lecture) (Prerequisite: BIOL 304 or permission)

BIOL 350 INSECT BIOLOGY AND CONTROL. (3) (Fall) (Exclusion: ENTO 330) A lecture course designed to introduce insect structure, physiology, biochemistry, development, systematics, evolution, ecology and control. The course stresses interrelationships and integrated pest control.

★ **BIOL 352 VERTEBRATE EVOLUTION.** (3) (Winter) (2 hours lecture, 3 hours laboratory) (Prerequisites: BIOL 304 or permission) The origin and evolution of the major groups of vertebrates; their anatomy, phylogeny and zoogeography. Structural, behavioral and physiological adaptations to different environments and energetic requirements. Evolutionary theory as applied to major events in the history of vertebrates; the origin and radiation of major taxa, patterns and rates of evolution.

BIOL 358 CANADIAN FLORA. (3) (Fall) (2 hours lecture, 3 hours laboratory) (Prerequisite: BIOL 111 or equivalent) Practical training in plant identification combined with an emphasis on major plant families and species important in temperate boreal, and arctic regions. Four days of required, pre-semester field excursions; contact the instructor well in advance of the course.

BIOL 370 HUMAN GENETICS APPLIED. (3) (Winter) (3 hours lecture; 1 hour conference optional) (Prerequisites: BIOL 200 and BIOL 201, BIOL 202) A contemporary view of what genetics can do when applied to human beings.

BIOL 373 BIOMETRY. (3) (Fall) (2 hours lecture and 2 hours laboratory per week) (Prerequisite: MATH 112 or equivalent) (Note: BIOL 373 may preclude credit for other statistics courses. See "Course Overlap" under "Faculty Degree Requirements") Elementary statistical methods in biology. The aim of this course is to introduce students to the analysis of biological data. Emphasis is placed on the assumptions behind statistical tests and models. The course is designed to give a student the ability to intelligently use the statistical techniques typically available on computer packages such as SYSTAT or SPSS. Preference given to Biology students; laboratory sections assigned at term's start.

BIOL 377 INDEPENDENT STUDIES IN BIOLOGY. (3) (Fall, Winter or Summer) (Open to U2 or U3 Biology students only) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) For course details, see BIOL 477.

BIOL 389 LABORATORY IN NEUROBIOLOGY. (3) (Winter) (1 hour lecture; 5 hours laboratory) (Prerequisites: BIOL 306 or PHGY 311 or PSYC 308 or NEUR 310 or permission) Provides experience in the methods of neurobiological research; experiments include extracellular and intracellular recording from nerve cells, electrical stimulation, and the study of neuro-behavioural problems.

BIOL 413 READING PROJECT. (1) (Fall or Winter) (3 hours independent work) (Prerequisites: BIOL 200, BIOL 201, BIOL 202, BIOL 205, BIOL 208, BIOL 304) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) Under the guidance of an instructor with the relevant expertise, the student explores the literature on a special

topic and develops a written review in scientific format. Registration form required as for BIOL 477.

● **BIOL 432 LIMNOLOGY.** (3) (Fall) (2 hours lecture; 3 hours laboratory) (Prerequisites: BIOL 206 and/or permission)

★ **BIOL 441 BIOLOGICAL OCEANOGRAPHY.** (3) (Winter) (2 hours lecture, 3 hours laboratory/conference) (Prerequisites: BIOL 206 and BIOL 208.) An introduction to how the ocean functions biologically: biology and ecology of marine plankton; regulation, extent and fate of production in the sea.

● ★ **BIOL 442 MARINE BIOLOGY.** (3) (Winter) (2 hours lecture, 1 laboratory or conference) (Prerequisites: BIOL 205, BIOL 208.)

BIOL 465 CONSERVATION BIOLOGY. (3) (Fall) (3 hours lecture) (Prerequisite: BIOL 208) (Not open to students who have taken 177-365) Discussion of relevant theoretical and applied issues in conservation biology. Topics: biodiversity, population viability analysis, community dynamics, biology of rarity, extinction, habitat fragmentation, social issues.

BIOL 468 TOPICS ON THE HUMAN GENOME. (3) (Winter) (3 hours lecture) (Prerequisites BIOL 202, BIOL 300, BIOL 370, or permission) Cellular and molecular approaches to characterization of the human genome.

● **BIOL 471 INDEPENDENT STUDIES IN BIOLOGY.** (6) (Summer) (Open only to U3 Biology students) (Prerequisite: BIOL 206 or BIOL 301 or other suitable laboratory course) (Projects must be arranged individually with a staff member of the Biology Department and a form from Ms. A. Comeau, Room W4/8, Stewart Building, must be completed to receive credit for the course) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section)

BIOL 471D1 INDEPENDENT STUDIES IN BIOLOGY. (3) (Fall) (Students must also register for BIOL 471D2) (No credit will be given for this course unless both BIOL 471D1 and BIOL 471D2 are successfully completed in consecutive terms) (BIOL 471D1 and BIOL 471D2 together are equivalent to BIOL 471) Research or reading projects, permitting independent study under the guidance of a staff member in the Biology Department specializing in the field of interest. A written report is required and a copy must be submitted to Ms. Comeau.

BIOL 471D2 INDEPENDENT STUDIES IN BIOLOGY. (3) (Winter) (Prerequisite: BIOL 471D1) (No credit will be given for this course unless both BIOL 471D1 and BIOL 471D2 are successfully completed in consecutive terms) (BIOL 471D1 and BIOL 471D2 together are equivalent to BIOL 471) See BIOL 471D1 for course description.

BIOL 475 HUMAN BIOCHEMICAL GENETICS. (3) (Winter) (3 hours lecture) (Prerequisites: BIOL 202 and BIOL 300) This "topics course" explores several major groups of human mutations through investigations of genes which affect collagen, globin function, immunity, etc. The course emphasizes the contribution of studies on humans to understanding of gene organization, expression and function.

BIOL 477 INDEPENDENT STUDIES IN BIOLOGY. (3) (Fall, Winter or Summer) (Open only to U3 Biology students) (Prerequisite: BIOL 206 or BIOL 301 or other suitable laboratory course. Projects must be arranged individually with a staff member of the Biology Department and a form from Ms. Comeau, Room W4/8, Stewart Building, must be completed to receive credit for the course) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) Research or reading projects, permitting independent study under the guidance of a staff member in the Biology Department specializing in the field of interest. A written report is required and a copy must be submitted with the mark to Ms. Comeau.

BIOL 478 INDEPENDENT STUDIES IN BIOLOGY. (3) (Fall, Winter or Summer) (Prerequisite: BIOL 206 or BIOL 301 or other suitable laboratory course. Projects must be arranged individually with a staff member of the Biology Department and a form from Ms. Comeau, Room W4/8, Stewart Building, must be completed to receive credit for the course) (Please see regulations concerning Project

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

Courses, under "Project Courses" in the Faculty Degree Requirements section) Research or reading projects, permitting independent study under the guidance of a staff member in the Biology Department specializing in the field of interest. A written report is required and a copy must be submitted with the mark to Ms. Comeau.

BIOL 479D1 INDEPENDENT STUDIES IN BIOLOGY. (4.5) (Fall) (8-12 hours per week research project and related seminars) (Restricted to Biology Honours students. Projects must be arranged individually with, and accepted by a staff member of the Biology Department) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) (Students must also register for BIOL 479D2) (No credit will be given for this course unless both BIOL 479D1 and BIOL 479D2 are successfully completed in consecutive terms) The major objective of the course is to provide an introduction to the design, execution and reporting of research. The quality of projects is examined by at least two members of the Biology Department.

BIOL 479D2 INDEPENDENT STUDIES IN BIOLOGY. (4.5) (Winter) (Prerequisite: BIOL 479D1) (No credit will be given for this course unless both BIOL 479D1 and BIOL 479D2 are successfully completed in consecutive terms) See BIOL 479D1 for course description.

BIOL 480D1 INDEPENDENT STUDIES IN BIOLOGY. (6) (Fall) (10-15 hours per week research project and related seminars) (Restriction and course description: as for BIOL 479) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) (Students must also register for BIOL 480D2) (No credit will be given for this course unless both BIOL 480D1 and BIOL 480D2 are successfully completed in consecutive terms)

BIOL 480D2 INDEPENDENT STUDIES IN BIOLOGY. (6) (Winter) (Prerequisite: BIOL 480D1) (No credit will be given for this course unless both BIOL 480D1 and BIOL 480D2 are successfully completed in consecutive terms) See BIOL 480D1 for course description.

BIOL 485 PLANT GROWTH AND DEVELOPMENT. (3) (Fall) (3 hours lecture) (Prerequisites: BIOL 205, BIOL 300 or permission of the instructor) (Not open to students who have taken BIOL 357) Processes involved in growth and development of the plant body; formation of new tissues and organs, photomorphogenesis; fruit growth and ripening, programmed cell death and senescence, plant responses to environmental stresses, biotechnology of crop improvement.

BIOL 499D1 HONOURS SEMINAR IN BIOLOGY. (2) (Fall) (Students must also register for BIOL 499D2) (No credit will be given for this course unless both BIOL 499D1 and BIOL 499D2 are successfully completed in consecutive terms) (BIOL 499D1 and BIOL 499D2 together are equivalent to BIOL 499) Honours students in Biology attend a selected series of guest speaker seminars of general interest and prepare reports. In addition, students give a seminar on their research.

BIOL 499D2 HONOURS SEMINAR IN BIOLOGY. (2) (Winter) (Prerequisite: BIOL 499D1) (No credit will be given for this course unless both BIOL 499D1 and BIOL 499D2 are successfully completed in consecutive terms) (BIOL 499D1 and BIOL 499D2 together are equivalent to BIOL 499) See BIOL 499D1 for course description.

★ **BIOL 505 DIVERSITY AND SYSTEMATICS SEMINAR.** (3) (Winter) (3 hours seminar) (Prerequisites: BIOL 304, BIOL 305, or permission) A course dealing in depth with a particular aspect of biological diversity and/or systematics. Topics may include the systematics of a particular taxon, issues in biodiversity, systematics theory and practice, etc. The class will discuss aspects of the chosen topic and prepare individual seminar reports.

BIOL 516 GENETICS OF DEVELOPMENT. (3) (Winter) (3 hours lecture) (Prerequisites: BIOL 202, BIOL 300, BIOL 303; permission) (Not open to students who have taken 177-416) This course aims to examine problems, theories, and experimental evidence on several concepts of mammalian developmental processes at molecu-

lar to organogenesis levels. Most topics are in the mouse model system, where various techniques for genetic manipulation are available.

BIOL 518 EUKARYOTIC CELL GENETICS. (3) (Winter) (2 hours seminar) (Prerequisite: BIOL 300 and permission) This course is designed for advanced undergraduate and graduate students. Readings from recent journal articles and reviews. Variable topics, including: cell differentiation, function of oncogenes and anti-oncogenes, growth regulation and cell cycle, gene transfer, recombination, mobile genetic elements, regulation of gene expression, cellular and viral replication, signal transduction.

BIOL 520 GENE ACTIVITY IN DEVELOPMENT. (3) (Winter) (3 hours lecture and discussion) (Prerequisites: BIOL 300 and BIOL 303 or permission) (Not open to students who have taken 177-420) An analysis of the role and regulation of gene expression in several models of eukaryotic development. The emphasis will be on critical evaluation of recent literature concerned with molecular or genetic approaches to the problems of cellular differentiation and determination. Recent research reports will be discussed in conferences and analyzed in written critiques.

BIOL 524 TOPICS IN MOLECULAR BIOLOGY. (3) (Fall) (Prerequisite: BIOL 300, BIOL 303 or permission) Recent literature in the fields of molecular genetics and molecular biology. Topics include: signal transduction, cell function, genetic diseases in eukaryotes.

★ **BIOL 530 NEURAL BASIS OF BEHAVIOUR.** (3) (Winter) (1 hour lecture, 2 hours seminar) (Prerequisite: BIOL 306 or PHGY 311 or PSYC 308) (Not open to students who have taken 177-430) This course examines neural mechanisms underlying behaviour. Topics will be introduced by a lecture, supplemented by a review article. This will be followed by student seminars and/or discussions. Topics will vary according to current literature, but will likely include communication, visual behaviour, escape, orientation, neurogenetics and locomotion.

BIOL 531 NEUROBIOLOGY LEARNING MEMORY. (3) (Fall) (3 hours lecture and discussion) (Prerequisite: BIOL 306 or permission) (Not open to students who have taken 177-431) Properties of nerve cells that are responsible for learning and memory. Recent advances in the understanding of neurophysiological, biochemical and structural processes relevant to neural plasticity. Emphasis on a few selected model systems involving both vertebrate and invertebrate animals.

BIOL 532 DEVELOPMENTAL NEUROBIOLOGY SEMINAR. (3) (Winter) (1 hour lecture, 2 hours seminar) (Prerequisites: BIOL 303 and BIOL 306 or permission) Discussions of all aspects of nervous system development including pattern formation, cell lineage, pathfinding and targetting by growing axons, and neuronal regeneration. The basis for these discussions will be recent research papers and other assigned readings.

BIOL 540 ECOLOGY OF SPECIES INVASIONS. (3) (Winter) (3 hours lecture) (Prerequisite: BIOL 208 or permission of instructor) (Not open to U1 or U2 students) (Not open to students who are taking or have taken ENVR 540.) Causes and consequences of invasion, as well as risk assessment methods and management strategies for dealing with this global problem.

★ **BIOL 544 GENETIC BASIS OF LIFE SPAN.** (3) (Fall) (1 hour lecture, 2 hours seminar) (Prerequisites: BIOL 202, BIOL 300; BIOL 303 recommended or permission) (Not open to students who have taken 177-444) The course will consider how gene action is determining the duration of life in various organisms focusing on the strengths and limitations of the genetic approach. The course will focus particularly on model organisms such as yeast, *Caenorhabditis*, *Drosophila* and mouse, as well as on the characterization of long-lived mutants.

● **BIOL 551 MOLECULAR BIOLOGY: CELL CYCLE.** (3) (Fall) (3 hours lecture) (Prerequisites: BIOL 200, BIOL 201, BIOL 300) (Not open to students who have taken 177-451)

BIOL 553 NEOTROPICAL ENVIRONMENTS. (3) (Winter) (24 hours lecture and 36 hours field work over a 4-week period) (Prerequisites: HISP 218, MATH 203, and BIOL 208/308, or equivalents, and per-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

mission of Program Coordinator.) (Corequisites: ENVR 451, GEOG 498 and ABEN 550.) (Not open to students who have taken BIOL 453) (Restriction: location in Panama. Students must register for a full semester of studies in Panama) Ecology revisited in view of tropical conditions. Exploring species richness. Sampling and measuring biodiversity. Conservation status of ecosystems, communities and species. Indigenous knowledge.

BIOL 570 ADVANCED SEMINAR IN EVOLUTION. (3) (Winter) (3 hours seminar) (Open to undergraduates by permission) Detailed analysis of a topic in evolutionary biology, involving substantial original research.

★ **BIOL 572 MOLECULAR EVOLUTION.** (3) (Fall) (3 hours lecture/seminar) (Prerequisite: BIOL 300) (Not open to students who have taken 177-472) Course is concerned with the rates and patterns of change in the genetic material (DNA sequences) and its products (proteins), through evolutionary time. The emphasis will be on the processes responsible for evolutionary change at the molecular level, such as selective neutrality, gene duplication, shuffling of exons, and transposition.

● ★ **BIOL 588 MOLECULAR/CELLULAR NEUROBIOLOGY.** (3) (Fall) (1 1/2 hours lecture, 1 1/2 hours seminar) (Prerequisite: BIOL 300 and BIOL 306 or permission)

BIOT – Biotechnology

Offered by: Department of Biology
Former Teaching Unit Code: 202

BIOT 505 SELECTED TOPICS IN BIOTECHNOLOGY. (3) (Fall) (Restricted to U3 students) Current methods and recent advances in biological, medical, agricultural and engineering aspects of biotechnology will be described and discussed. An extensive reading list will complement the lecture material.

CHEM – Chemistry

Offered by: Department of Chemistry
Former Teaching Unit Code: 180

CHEM 110 GENERAL CHEMISTRY 1. (4) (Fall) (3 lectures and laboratory) (Prerequisites/corequisites: College level mathematics and physics or permission of instructor; CHEM 120 is not a prerequisite) (Not open to students who have taken or are taking CHEM 111. See "Course Overlap" under "Faculty Degree Requirements") (Each lab section is limited enrolment) A study of the fundamental principles of atomic structure, valence theory and periodic table.

CHEM 112 GENERAL CHEMISTRY LABORATORY. (1) (Fall) (2 1/2 hours laboratory) (Open only to entering students who have the lecture equivalent of CHEM 110) (Each lab section is limited enrolment) Illustrative experiments. Laboratory section of CHEM 110. New students will be issued lab sections in OM 1 on the first day of classes.

CHEM 120 GENERAL CHEMISTRY 2. (4) (Winter) (3 lectures and laboratory) (Prerequisites/corequisites: College level mathematics and physics, or permission of instructor: CHEM 110 is not a prerequisite) (Not open to students who have taken or are taking CHEM 121. See "Course Overlap" under "Faculty Degree Requirements") (Each lab section is limited enrolment) A study of the fundamental principles of physical chemistry.

CHEM 122 GENERAL CHEMISTRY LABORATORY. (1) (Winter) (2 1/2 hours laboratory) (Open only to entering students who have the lecture equivalent of CHEM 120) Illustrative experiments. Laboratory section of CHEM 120.

CHEM 150 WORLD OF CHEMISTRY: FOOD. (3) (Winter) (3 lectures) (No prerequisites) (Science students may take for credit only two of: CHEM 150, CHEM 160, CHEM 170, CHEM 180. These courses can be taken independently of each other) A series of lectures on the historical, practical, and simple chemical aspects of: food, food additives; vitamins; minerals, diet and cancer; dieting; water.

CHEM 160 WORLD OF CHEMISTRY: TECHNOLOGY. (3) (Fall) (3 lectures) (No prerequisites) (Science students may take for credit only two of: CHEM 150, CHEM 160, CHEM 170, CHEM 180. These courses can be taken independently of each other) Aspects of chemical technology including publishing of scientific articles, rocketry, chemistry of space travel, materials (metals, ceramics, wood, plastic), genetic engineering chemistry, forensic science, art and money.

CHEM 170 WORLD OF CHEMISTRY: DRUGS. (3) (Fall) (3 lectures) (No prerequisites) (Science students may take for credit only two of: CHEM 150, CHEM 160, CHEM 170, CHEM 180. These courses can be taken independently of each other) Aspects of drugs including drug history, over the counter drugs (e.g. aspirin, cough remedies, allergy preparations), and street drugs. Significant attention will be paid to prescription drugs such as heart remedies and antibiotics.

CHEM 180 WORLD OF CHEMISTRY: ENVIRONMENT. (3) (Winter) (3 lectures) (No prerequisites) (Science students may take for credit only two of: CHEM 150, CHEM 160, CHEM 170, CHEM 180. These courses can be taken independently of each other) Water, air pollution, sick-building syndrome, the chemistry of the car, energy (fossil fuel, nuclear), household products, quackery (18th century to the internet), computers and cosmetics.

CHEM 199 FYS: WHY CHEMISTRY? (3) (Fall) (2 lectures and 1 seminar) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) A lecture/seminar course which is expected to deal with a) colour, from gemstones to lasers; b) microscopes that see atoms - with demonstrations; c) the atmosphere: the greenhouse effect, and acid rain, and d) scientific ethics in research and publication.

CHEM 201 MODERN INORGANIC CHEMISTRY 1. (3) (Fall) (3 lectures) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent. Not open to Honours or Majors in chemistry) (Not open to students who have taken or plan to take CHEM 281) Systematic survey of the chemistry of the main group elements and their compounds. Basic concepts of electronic structure, bonding and structure will be developed and applied to the understanding of common materials. Emphasis on elements such as oxygen, nitrogen, silicon and others in order to understand their role in our everyday lives.

CHEM 203 SURVEY OF PHYSICAL CHEMISTRY. (3) (Fall and Summer) (3 lectures) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent. Intended for students in biological science programs requiring only one course in physical chemistry) (Not open to students who have taken or are taking CHEM 204 or CHEM 213) A survey of the principles and methods of physical chemistry with emphasis on the use of biological examples. Topics will include thermodynamics, transport properties, kinetics, molecular structure and interactions, and spectroscopy.

CHEM 204 PHYSICAL CHEMISTRY/BIOLOGICAL SCIENCES 1. (3) (Fall and Winter) (3 lectures) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent and one full course in calculus) (Not open to students who have taken or are taking CHEM 203 or CHEM 213) Similar to CHEM 213. Emphasis on the use of biological examples to illustrate the principles of physical chemistry. The relevance of physical chemistry to biology is stressed.

CHEM 212 INTRODUCTORY ORGANIC CHEMISTRY 1. (4) (Fall and Winter and Summer) (3 lectures and laboratory) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent courses. Not open to students who have taken CEGEP objective 00XV or equivalent) (Each lab section is limited enrolment) A survey of reactions of aliphatic and aromatic compounds including modern concepts of bonding, mechanisms, conformational analysis, and stereochemistry.

CHEM 213 INTRODUCTORY PHYSICAL CHEMISTRY. (3) (Winter) (3 lectures) (Prerequisites: CHEM 110, CHEM 120 and Mathematics MATH 222 or equivalent) (Not open to students who have taken or are taking CHEM 203 or CHEM 204) Gas laws, kinetic theory. First

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

law of thermodynamics, enthalpy, thermochemistry, bond energies. Second law of thermodynamics; the entropy and the free energy functions. Chemical and thermodynamic equilibrium states. Phase rule. Colligative properties of ideal solutions. Topics may include: chemical kinetics, electrochemistry and others.

CHEM 214 PHYSICAL CHEMISTRY/BIOLOGICAL SCIENCES 2. (3) (Winter) (3 lectures) (Prerequisites: CHEM 213 or CHEM 204) Emphasis is placed on the use of biological examples to illustrate the principles of physical chemistry. The relevance of physical chemistry to biology is stressed.

CHEM 217 GENERAL ANALYTICAL CHEMISTRY LAB 1. (1) (Fall) (3 hours) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent) Laboratory portion of an individualized program in analytical chemistry.

● ★ **CHEM 219 INTRODUCTION TO ATMOSPHERIC CHEMISTRY.** (3) (Winter) (3 lectures) (Prerequisite: CEGEP DEC in Science or permission of instructor) (Not open to students who have taken ATOC 219, CHEM 419, or ATOC 419) (Offered in even years. Students should register in ATOC 219 in odd years)

CHEM 222 INTRODUCTORY ORGANIC CHEMISTRY 2. (4) (Fall and Winter and Summer) (3 lectures and laboratory) (Prerequisite: CHEM 212 or equivalent.) (Not open to students who have taken Chemistry 302 or equivalent at CEGEP.) Modern spectroscopic techniques for structure determination. The chemistry of alkyl halides, alcohols, ethers, carbonyl compounds and amines with special attention to mechanistic aspects. Special topics.

CHEM 224 ORGANIC CHEMISTRY LABORATORY 1. (1) (Fall and Winter and Summer) (4 hours laboratory) (Open only to students who have the lecture equivalent of CHEM 212) Illustrative experiments in organic chemistry. Laboratory section of CHEM 212.

CHEM 233 TOPICS IN PHYSICAL CHEMISTRY. (3) (Winter) ((3-0-6)) (For Chemical Engineers only) Introduction to chemical kinetics, surface and colloid chemistry and electrochemistry. The topics to be discussed will be of particular interest to students in chemical engineering.

CHEM 234 TOPICS IN ORGANIC CHEMISTRY. (3) (Fall and Winter and Summer) ((3-0-6)) (Prerequisite: CHEM 212 or equivalent) (For Chemical Engineers only) Modern spectroscopic techniques for structure determination. The chemistry of alkyl halides, alcohols, ethers, carbonyl compounds and amines with special attention to mechanistic aspects. Special topics.

CHEM 237 GENERAL ANALYTICAL CHEMISTRY LAB 2. (1) (Winter) (3 hours) (Prerequisite: CHEM 217) Laboratory portion of an individualized program in analytical chemistry.

CHEM 244 ORGANIC CHEMISTRY LABORATORY 2. (1) (Fall and Winter and Summer) (4 hours laboratory) (Prerequisite: CHEM 234 or equivalent) Laboratory section of CHEM 222.

CHEM 257D1 INTRODUCTORY ANALYTICAL CHEMISTRY. (2) (Fall) (1 lecture, 1 homework tutorial and 4 hours laboratory) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent.) (Not open to students who have taken or are taking CHEM 277.) (Each lab section is limited enrolment) (Students must also register for CHEM 257D2) (No credit will be given for this course unless both CHEM 257D1 and CHEM 257D2 are successfully completed in consecutive terms) A survey of analytical chemistry including the theory and practice of representative gravimetric, volumetric and instrumental methods.

CHEM 257D2 INTRODUCTORY ANALYTICAL CHEMISTRY. (2) (Winter) (Prerequisite: CHEM 257D1) (No credit will be given for this course unless both CHEM 257D1 and CHEM 257D2 are successfully completed in consecutive terms) See CHEM 257D1 for course description.

CHEM 273 CHEMICAL KINETICS. (1) (Winter) (1 lecture) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent. For Honours and Major Chemistry students. Other students with permission of instructor.) Order, molecularity, reaction mechanisms and rate constants. Determination of order, effect of temperature on rate, activated state theory. Collision theory. Reac-

tions in solution, homogeneous catalysis, upper atmosphere kinetics, drug kinetics.

CHEM 277D1 ANALYTICAL CHEMISTRY. (1.5) (Fall) (2 lectures and 4 h laboratory) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent. For Chemistry Honours and Majors students only.) (Not open to students who have taken or are taking CHEM 257.) (Each lab section is limited enrolment.) (Students must also register for CHEM 277D2) (No credit will be given for this course unless both CHEM 277D1 and CHEM 277D2 are successfully completed in consecutive terms) Qualitative and quantitative analysis. A survey of methods of analysis including theory and practice of semimicro qualitative analysis and representative gravimetric, volumetric and instrumental methods.

CHEM 277D2 ANALYTICAL CHEMISTRY. (1.5) (Winter) (Prerequisite: CHEM 277D1) (No credit will be given for this course unless both CHEM 277D1 and CHEM 277D2 are successfully completed in consecutive terms) See CHEM 277D1 for course description.

CHEM 281 INORGANIC CHEMISTRY 1. (3) (Fall) (3 lectures) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent. For Honours and Major Chemistry students) (Not open to students who have taken or plan to take CHEM 201) Basic concepts of electronic structure and molecular bonding will be developed and applied to the understanding of common materials. Acid-base chemistry. Survey of the chemistry of the main group elements. Introduction to coordination and organometallic chemistry.

● **CHEM 301 MODERN INORGANIC CHEMISTRY 2.** (3) (3 lectures) (Prerequisites: CHEM 110 or CHEM 111 and CHEM 120 or CHEM 121 or equivalent) (Not open to students who have taken or plan to take CHEM 381)

CHEM 302 INTRODUCTORY ORGANIC CHEMISTRY 3. (3) (Fall and Winter) (3 lectures) (Prerequisite: CHEM 222) Topics covered may include the following: aromatics and heterocyclics, carbanions, rearrangements, molecular orbital considerations, polymers and biomolecules.

CHEM 307 ANALYTICAL CHEMISTRY OF POLLUTANTS. (3) (2 lectures and laboratory with field trips) (Prerequisites: One course in analytical chemistry) Description of current analytical practices in air and water pollution; critical evaluation of the reliability of the methods, with particular emphasis on interfering substances; rudiments of automated instrumentation; toxicological analysis as it relates to pollution.

CHEM 334 ADVANCED MATERIALS. (3) (Fall) (Prerequisites: CHEM 110/CHEM 120 or CHEM 111/CHEM 121 and PHYS 101/PHYS 102 or PHYS 131/PHYS 142, or CEGEP Physics and Chemistry, or equivalent. Prerequisite or Corerequisite: one of CHEM 203, CHEM 204, CHEM 213, CHEM 214 or equivalent; or one of PHYS 230 and PHYS 232, or equivalent; or permission of instructor.) (Not open to students who have taken or are taking PHYS 334.) The physicochemical properties of advanced materials. Topics discussed include photonics, information storage, 'smart' materials, biomaterials, clean energy materials, porous materials, and polymers.

CHEM 345 MOLECULAR PROPERTIES AND STRUCTURE 1. (3) (Fall) (3 lectures) (Prerequisites: CHEM 213 and MATH 315. For Chemistry Honours and Majors only) An introduction to quantum chemistry covering the historical development, wave theory, methods of quantum mechanics, and applications of quantum chemistry.

● **CHEM 350 EARTH, AIR, FIRE, WATER.** (3) (3 lectures) (Prerequisites: CHEM 212 or equivalent and CHEM 204 or equivalent)

CHEM 352 STRUCTURAL ORGANIC CHEMISTRY. (3) (Winter) (3 lectures) (Prerequisite: CHEM 302) Modern methods of structure determination, employing spectroscopic techniques; stereochemistry.

CHEM 355 MOLECULAR PROPERTIES AND STRUCTURE 2. (3) (Winter) (3 lectures) (Prerequisite: CHEM 345) A survey of the principles of electronic, vibrational and rotational spectroscopy. Magnetic resonance methods.

CHEM 362 ADVANCED ORGANIC CHEMISTRY LABORATORY. (2) (Fall and Winter) (4 hours) (Prerequisite or corequisite: CHEM 302. Not

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

open to Honours or Majors in Chemistry) An advanced laboratory with experiments related to the theoretical principles and synthetic methods of modern organic chemistry.

CHEM 363 PHYSICAL CHEMISTRY LABORATORY 1. (2) (Fall and Winter) (3 hours) (Prerequisites: CHEM 213 and CHEM 273) (Each lab section is limited enrolment) Selected experiments to illustrate physico-chemical principles.

CHEM 365 STATISTICAL THERMODYNAMICS. (2) (Winter) (2 lectures) (Prerequisite: CHEM 345) Molecular basis of thermodynamics with applications to ideal gases and simple solids. Topics to be covered will include: calculation of thermodynamic functions, chemical equilibrium constants, Einstein and Debye models of solids, absolute reaction rate theory, Debye-Hückel theory of strong electrolytes.

CHEM 367 INSTRUMENTAL ANALYSIS 1. (3) (Fall) (2 lectures and 4 hours of laboratory) (Prerequisite: CHEM 257 or CHEM 277) (Each lab section is limited enrolment) An introduction to modern methods of instrumental analysis emphasizing chromatography and electrochemical methods. Analytical methods to be examined in detail include gas liquid chromatography, high performance liquid chromatography, flow injection analysis, and electrochemical methods. Laboratory exercises give the student practical exposure to these techniques.

CHEM 371 INORGANIC CHEMISTRY LABORATORY. (2) (Fall and Winter) (4 hours) (Prerequisite: CHEM 362; prerequisite/corequisite: CHEM 381. Not open to students who have taken CHEM 392) Modular format incorporating self-paced and self-guided instructions. In consultation with the instructors, a program of experimental modules is chosen covering projects related to theoretical principles, synthetic techniques and those instrumental methods used in modern inorganic and organometallic chemistry.

Also offered as:

CHEM 371D1 INORGANIC CHEMISTRY LABORATORY. (1) (Fall) (Students must also register for CHEM 371D2)

CHEM 371D2 INORGANIC CHEMISTRY LABORATORY. (1) (Winter) (Prerequisite: CHEM 371D1)

CHEM 377 INSTRUMENTAL ANALYSIS 2. (3) (Winter) (2 lectures and 4 hours of laboratory) (Prerequisite: CHEM 257 or CHEM 277) (Each lab section is limited enrolment) Spectroscopic methods of analysis will be studied with respect to fundamentals, operational aspects and instrument design. Topics will range from UV-visible to x-ray spectrometry. Methodologies will be evaluated with respect to their application in spectrometric systems. Laboratory automation will be studied and applied in the laboratory.

CHEM 381 CHEMISTRY OF TRANSITION ELEMENTS. (3) (Fall) (3 lectures) (Prerequisite: CHEM 281. For Honours and Major Chemistry students) (Not open to students who have taken or plan to take CHEM 301) The history of transition chemistry, coordination numbers and geometry, nomenclature and symmetry. Crystal field theory will be described and applied to problems in spectroscopy, magnetochemistry, thermodynamics and kinetics. Several aspects of organometallic and bioinorganic chemistry are also discussed.

CHEM 382 ORGANIC CHEMISTRY: NATURAL PRODUCTS. (3) (Winter) (3 lectures) (Prerequisite/corequisite: CHEM 302) Structure, synthesis, stereochemistry and biosynthesis.

CHEM 392 INTEGRATED INORGANIC/ORGANIC LABORATORY. (3) (Fall and Winter) (4 hours) (Prerequisite/corequisites: CHEM 381 and CHEM 302. Advanced laboratory for Chemistry Honours and Major students. Students enrolled in CHEM 392 are strongly advised to choose the D option.) (Not open to students who have taken CHEM 362.) Modular format of self-paced and self-guided instruction. A program of modules is selected in consultation with the laboratory staff. The experimental modules consist of projects related to the theoretical principles, synthetic techniques and instrumental methods used in modern organic, inorganic and organometallic chemistry.

Also offered as:

CHEM 392D1 INTEGRATED INORGANIC/ORGANIC LABORATORY. (1.5) (Fall) (Students must also register for CHEM 392D2)

CHEM 392D2 INTEGRATED INORGANIC/ORGANIC LABORATORY. (1.5) (Winter) (Prerequisite: CHEM 392D1)

CHEM 393 PHYSICAL CHEMISTRY LABORATORY 2. (2) (Fall and Winter) (3 hours) (Prerequisite: CHEM 363) (Each lab section is limited enrolment.) Selected experiments to illustrate physico-chemical principles more advanced than those of CHEM 363.

CHEM 402 ADVANCED BIO-ORGANIC CHEMISTRY. (3) (Winter) (2 lectures, 1 hour seminar per week) (Prerequisite: CHEM 302) The application of advanced concepts of organic and physical chemistry to biological systems. The properties of amino acids, peptides, proteins, enzymes, nucleosides, etc., will be discussed and their relationship to biochemical reactions, the origins of life, coenzymes, template syntheses, neurochemistry, etc.

● ★ **CHEM 419 ADVANCES IN CHEMISTRY OF ATMOSPHERE.** (3) (Winter) (3 lectures) (Prerequisites: CHEM 213, CHEM 273, MATH 222 and MATH 315 (or equivalents), or permission of instructor) (Not open to students who have taken ATOC 419, CHEM 619, or ATOC 619) (Offered in even years. Students should register in ATOC 419 in odd years.)

CHEM 455 INTRODUCTORY POLYMER CHEMISTRY. (3) (Fall) (Prerequisites: CHEM 213 and CHEM 273.) A survey course on the structure of polymers, kinetics and mechanisms of polymer and copolymer synthesis; characterization and molecular weight distributions; polymer microstructure, the thermodynamics of polymer solutions; the crystalline and amorphous states, rubber elasticity and structure-property relationships.

CHEM 462 GREEN CHEMISTRY. (3) (Fall) (3 lectures) (Prerequisites: CHEM 302 and CHEM 381) New reactions and methods which can be used for the production of chemicals from renewable feedstocks; the use of new environmentally benign solvents, catalysts and reagents; organic reactions in aqueous media and in supercritical carbon dioxide; bio-catalysis and bio-processes.

CHEM 470 RESEARCH PROJECT. (6) (Fall and Winter) (Prerequisite: registration by Departmental permission only) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) A course designed to give students research experience. The student will be assigned a project supervisor and a research project at the beginning of the session. The project will consist of a literature survey, experimental and/or theoretical work, a written research report and an oral examination.

Also offered as:

CHEM 470D1 RESEARCH PROJECT. (3) (Fall) (Students must also register for CHEM 470D2)

CHEM 470D2 RESEARCH PROJECT. (3) (Winter) (Prerequisite: CHEM 470D1)

CHEM 480 RESEARCH PROJECT. (3) (Fall) (Prerequisite or Corequisite: CHEM 490. Registration by Departmental permission only.) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) A course designed to give Honours students research experience. The student will be assigned a project supervisor and a research project at the beginning of the session. The project will consist of a literature survey, experimental or theoretical work, a written research report and an oral examination.

Also offered as:

CHEM 480D1 RESEARCH PROJECT. (1.5) (Fall) (Students must also register for CHEM 480D2)

CHEM 480D2 RESEARCH PROJECT. (1.5) (Winter) (Prerequisite: CHEM 480D1)

CHEM 490D1 RESEARCH PROJECT. (1.5) (Fall) (Prerequisite or Corequisite: CHEM 480. Registration by Departmental permission only) (Please see regulations concerning Project Courses, under "Project Courses" in the Faculty Degree Requirements section) (Students must also register for CHEM 490D2) (No credit will be given for this course unless both CHEM 490D1 and CHEM 490D2 are successfully completed in consecutive terms) A course

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designed to give Honours students research experience. The student will be assigned a project supervisor and a research project at the beginning of the session. The project will consist of a literature survey, experimental or theoretical work, a written research report and an oral examination.

CHEM 490D2 RESEARCH PROJECT. (1.5) (Winter) (Prerequisite: CHEM 490D1) (No credit will be given for this course unless both CHEM 490D1 and CHEM 490D2 are successfully completed in consecutive terms) See CHEM 490D1 for course description.

CHEM 503 DRUG DESIGN AND DEVELOPMENT 1. (3) (Fall) (Prerequisites: CHEM 302, BIOL 200, BIOL 201 or BIOC 212, PHAR 300 or PHAR 301 or PHAR 303 or permission of instructor) (U3 and graduate students. Students can register only with permission of coordinators. Priority: students registered in the Minor in Pharmacology) (Not open to students who are taking or have taken PHAR 503) Interdisciplinary course in drug design and development covering chemistry, mechanisms of action and steps in drug development, principles and problems in drug design.

CHEM 504 DRUG DESIGN AND DEVELOPMENT 2. (3) (Winter) (Prerequisite: CHEM 503 and permission of instructor) (U3 and graduate students. Students can register only with permission of coordinators) (Not open to students who are taking or have taken PHAR 504) Groups of 2-4 students with different backgrounds will form a team. Each team will select a lead compound, design the analogues, propose the preclinical and clinical studies, present possible untoward effects, and reasons for drug (dis)approval.

● **CHEM 531 CHEMISTRY OF INORGANIC MATERIALS.** (3) (Winter) (3 lectures) (Prerequisite: CHEM 381)

CHEM 534 NANOSCIENCE AND NANOTECHNOLOGY. (3) (Fall) (Prerequisites: CHEM 334 or PHYS 334 or permission of instructor. Corequisites: one of CHEM 345, PHYS 357, or PHYS 446 or permission of instructor) (Not open to students who have taken or are taking PHYS 534) Topics discussed include scanning probe microscopy, chemical self-assembly, computer modelling, and microfabrication/micromachining.

● **CHEM 543 CHEMISTRY OF PULP AND PAPER.** (3) (Fall) (2 lectures plus a reading/research project.) (Prerequisite: CHEM 302 or permission of instructor.)

CHEM 547 LABORATORY AUTOMATION. (3) (Winter) (Two 1.5 hour lectures, lab) (Prerequisite: CHEM 377, equivalent or permission of instructor) Automation and data handling with respect to modern chemical laboratory instrumentation. Basic electronics, data acquisition, evaluation of laboratory needs, data processing methodologies.

CHEM 552 PHYSICAL ORGANIC CHEMISTRY. (3) (Fall) (Prerequisite: CHEM 302) The correlation of theory with physical measurements on organic systems; an introduction to photochemistry; solvent and substituent effects on organic reaction rates, etc.; reaction mechanisms.

CHEM 555 NMR SPECTROSCOPY. (3) (Fall) (3 lectures) (Prerequisite: CHEM 355 or equivalent) Interpretation of proton and carbon-13 nuclear magnetic resonance spectroscopy in one dimension for structural identification.

CHEM 556 ADVANCED QUANTUM MECHANICS. (3) (Fall) (3 lectures) (Prerequisites: CHEM 345 and PHYS 242) Quantum mechanical treatment of species of chemical interest. Introduction to perturbation theory, both time-dependent and time-independent. Treatment of the variational principle. Introduction to atomic spectra. Chemical bonding in terms of both the valence bond and molecular orbital theory. Elementary collision theory. Interaction of radiation with molecules.

CHEM 567 CHEMOMETRICS: DATA ANALYSIS. (3) (Winter) (2 lectures and 3 hours of laboratory) (Prerequisite: Linear Algebra and experience in some computer programming language) Topics covered include; factorial analysis of chemical spectra, pattern recognition from multisensor data, linear and nonlinear optimization for the determination of optimal reaction conditions molecular modeling, multisensor calibration, etc.

CHEM 571 POLYMER SYNTHESIS. (3) (Winter) (3 lectures) (Prerequisite: CHEM 302 or equivalent, or permission of instructor.) A survey of polymer preparation and characterization; mechanisms of chain growth, including free radical, cationic, anionic, condensation and transition metal-mediated polymerization, and the effects of these mechanisms on polymer architecture; preparation of alternating, block, graft and stereoblock copolymers; novel macromolecular structures including dendrimers and other nanostructures.

● **CHEM 572 SYNTHETIC ORGANIC CHEMISTRY.** (3) (3 lectures) (Prerequisite: CHEM 382)

CHEM 575 CHEMICAL KINETICS. (3) (Winter) (3 lectures) (Prerequisites: CHEM 273 and CHEM 213) Kinetic laws, measurement of reaction rates, transition state and collision theory. Elementary reactions in gas, solution and solid phases and on surfaces. Reaction mechanisms, laser techniques, molecular beams, chemiluminescence, explosions. Extensive use of computers to simulate the kinetic behaviour of chemical systems.

● **CHEM 576 QUANTUM CHEMISTRY.** (3) (Lecture and/or reading course) (Prerequisite: CHEM 345)

● **CHEM 577 ELECTROANALYTICAL CHEMISTRY.** (3) (Prerequisites: CHEM 367 and CHEM 377)

CHEM 581 INORGANIC TOPICS 1. (3) (Winter) (Prerequisite: CHEM 381) An introduction to some areas of current interest in inorganic chemistry. Each year a selection of several particularly active areas will be chosen.

CHEM 585 COLLOID CHEMISTRY. (3) (Winter) (Prerequisites: CHEM 273 and CHEM 345, MATH 223 and MATH 315, PHYS 241 and PHYS 242 or permission of instructor) Principles of the physical chemistry of phase boundaries. Electrical double layer theory; van der Waals forces; Brownian motion; kinetics of coagulation; electrokinetics; light scattering; solid/liquid interactions; adsorption; surfactants; hydrodynamic interactions; rheology of dispersions.

● **CHEM 587 TOPICS IN MODERN ANALYTICAL CHEMISTRY.** (3) (Fall) (Prerequisites: CHEM 367 and CHEM 377)

CHEM 591 ADVANCED COORDINATION CHEMISTRY. (3) (Winter) (3 hours) (Prerequisite: CHEM 381) (For Honours and Major Chemistry students or with permission) In-depth treatment of advanced topics in coordination chemistry, such as bio-inorganic chemistry and transition metal catalysis and solid state inorganic chemistry.

CHEM 593 STATISTICAL MECHANICS. (3) (Winter) (2 lectures) (Research project) (Prerequisite: CHEM 345. Recommended: CHEM 355) Basic hypotheses of statistical thermodynamics; ideal monatomic, diatomic and polyatomic gases; Einstein and Debye models of solids; statistical theory of black-body radiation; Debye-Hückel theory of electrolyte solutions; absolute reaction rate theory of rate processes; theories of solutions.

CHEM 597 ANALYTICAL SPECTROSCOPY. (3) (Fall) (2 lectures; 3 hours lab) (Prerequisites: CHEM 367 and CHEM 377) The design and analytical use of spectroscopic instrumentation with respect to fundamental and practical limitations. Classical emission, fluorescence, absorption and chemical luminescence. Topics may include photo-acoustic spectroscopy, multielement analysis, X-ray fluorescence and modern multiwavelength detector systems.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

COMP – Computer Science (Sci)

Offered by: School of Computer Science
Former Teaching Unit Code: 308

Computer Science Course Restriction Notes

The following programs are defined as belonging to the Core Group or the Mathematics Group to simplify the explanation of course restrictions:

Core Group:

Major in Computer Science
Honours in Computer Science
Joint Major in Mathematics and Computer Science
Joint Major in Physics and Computer Science
Joint Honours in Mathematics and Computer Science
Major in Software Engineering
Bachelor of Software Engineering
Major Concentration in the Foundations of Computing
Minor Concentration in Foundations of Computing
Minor Concentration in Computer Science
Faculty Program in Mathematics and Computer Science
Faculty Program in Mathematics, Statistics and Computer Science

Mathematics Group:

Honours in Mathematics
Honours in Applied Mathematics
Honours in Probability and Statistics

- A. COMP 202 and COMP 208 cannot both be taken for credit. COMP 202 is intended as a general introductory course, while COMP 208 is intended for students interested in scientific computations. Credits for either of these courses will not count towards the 60-credit Major in Computer Science.
- B. COMP 203 and COMP 250 are considered to be equivalent from a prerequisite point of view, and cannot both be taken for credit. Computer Science Major and Honours students are strongly advised to take MATH 240 with COMP 250 but before COMP 251.
- C. COMP 208 cannot be taken for credit with or after COMP 250.
- D. Credit will not be given for COMP 102 if it is taken concurrently with, or after, any of: COMP 202, COMP 203, COMP 208, COMP 250.
- E. COMP 431 is open only to B.Eng. students in Electrical and Computer Engineering. Credit will be given for only one of: COMP 431, COMP 251, COMP 360.
- F. Management students cannot receive credit for COMP 102.
- G. Open only to students registered in a Core Group* or Mathematics Group* program. (* as defined above)
- H. Students registered in a Core Group* (with the exception of those in the Minor Concentration in Computer Science Stream I) or Mathematics Group* program may NOT take this course. (* as defined above)
- I. Open only to students registered in a Core Group* or Mathematics Group* program, or the Minor in Computer Science. (* as defined above)
- J. Open only to students registered in a Core Group* or Mathematics Group* program, or the Minor in Computer Science, or the Minor in Cognitive Science. (* as defined above)
- K. Open only to students registered in a Core Group* or Mathematics Group* program, or the Major in Computer Engineering. (* as defined above)
- L. Open only to students registered in a Core Group* or Mathematics Group* program, or the Major in Computer Engineering, or the Minor in Computer Science. (* as defined above)
- M. COMP 250 and COMP 203 cannot both be taken for credit.
- N. COMP 202 cannot be taken for credit with or after COMP 250.

COMP 102 COMPUTERS AND COMPUTING. (3) (Fall) (2 hours lectures; 2 hours laboratory) (Prerequisite: high school level mathematics course on functions.) (Restriction Notes: D, F) A course for students with no previous knowledge of computer science who may be interested in further study. The structure of a computer; methodologies for problem solving - algorithm design and data structures, the limitations of computers. An introduction to programming in a high level language.

● **COMP 199 FYS: EXCURSIONS IN COMPUTER SCIENCE.** (3) (Fall) (3 hours) (Prerequisite: high school mathematics) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25)

COMP 202 INTRODUCTION TO COMPUTING 1. (3) (Fall and Winter) (3 hours) (Prerequisite: a CEGEP level mathematics course) (Restriction Notes: A, N.) Overview of components of microcomputers, the internet design and implementation of programs using a modern high-level language, an introduction to modular software design and debugging. Programming concepts are illustrated using a variety of application areas.

COMP 203 INTRODUCTION TO COMPUTING 2. (3) (Fall and Winter) (3 hours) (Prerequisites: MATH 133 and COMP 202) (Restriction Notes: B, H, M) Basic data structures. Representation of arrays, stacks, and queues. Linked lists and their applications to binary trees. Internal sorting. Graph representation. Elementary graph algorithms.

COMP 206 INTRODUCTION TO SOFTWARE SYSTEMS. (3) (Fall and Winter) (3 hours) (Prerequisite: COMP 203 or COMP 250) (Restriction Note: I) Comprehensive overview of programming in C, use of system calls and libraries, debugging and testing of code; use of developmental tools like make, version control systems.

COMP 208 COMPUTERS IN ENGINEERING. (3) (Fall and Winter) (3 hours) (Prerequisite: differential and integral calculus. Corequisite: linear algebra: determinants, vectors, matrix operations.) (Restriction Notes: A, C) Introduction to computer systems. Concepts and structures for high level programming. Elements of structured programming using FORTRAN 90 and "C". Assignments in both main-frame and microcomputer environment. Numerical algorithms such as root finding, numerical integration and differential equations. Non-numerical algorithms for sorting and searching.

COMP 250 INTRODUCTION TO COMPUTER SCIENCE. (3) (Fall and Winter) (Prerequisites: Familiarity with a high level programming language and CEGEP level Math.) (Restriction Notes: B, K, M) An introduction to the design of computer algorithms, including basic data structures, analysis of algorithms, establishing correctness of programs and program testing. Overview of topics in computer science.

COMP 251 DATA STRUCTURES AND ALGORITHMS. (3) (Fall and Winter) (Prerequisites: MATH 240 and either COMP 250 or COMP 203) (Not open to students who have taken or are taking COMP 252.) (Restriction Notes: B, E, G) Design and analysis of algorithms. Complexity of algorithms. Data structures. Introduction to graph algorithms and their analysis.

COMP 252 ALGORITHMS AND DATA STRUCTURES. (3) (Winter) (3 hours) (Prerequisite: COMP 250 and MATH 240) (Open only to students registered in following programs: Honours in Computer Science, Joint Honours in Mathematics and Computer Science, Honours in Applied Mathematics, Honours in Mathematics.) (Not open to students who have taken or are taking COMP 251.) The design and analysis of data structures and algorithms. The description of various computational problems and the algorithms that can be used to solve them, along with their associated data structures. Proving the correctness of algorithms and determining their computational complexity.

COMP 273 INTRODUCTION TO COMPUTER SYSTEMS. (3) (Fall and Winter) (Prerequisite: COMP 206) (Restriction Note: I) Computer structure, machine instruction execution, addressing techniques, digital representation of data. Assemblers, cross-assemblers and simulators. Interrupts. Input and output programming and devices.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

System support macros and software. Program segmentation and linkage.

COMP 302 PROGRAMMING LANGUAGES AND PARADIGMS. (3) (Fall and Winter) (3 hours) (Prerequisite: COMP 250 or COMP 203) (Restriction Note: L) Programming language design issues and programming paradigms. Binding and scoping, parameter passing, lambda abstraction, data abstraction, type checking. Functional and logic programming.

COMP 303 PROGRAMMING TECHNIQUES. (4) (Winter) (3 hours, 3 lab hours) (Prerequisites: COMP 206, COMP 251, COMP 302) (Restriction Note: I) Software architecture, design patterns, object-oriented programming concepts, profiling and optimization. Students will implement a significant programming project.

COMP 304 OBJECT-ORIENTED DESIGN. (3) (Fall) (3 hours) (Prerequisites: COMP 206, COMP 251, COMP 302) (Restriction Note: I) The object model, objects and classes, verification and testing, object-oriented analysis, unified modeling language and design patterns.

COMP 310 COMPUTER SYSTEMS AND ORGANIZATION. (3) (3 hours) (Prerequisite: COMP 273) (Restriction Note: I) Control and scheduling of large information processing systems. Operating system software - resource allocation, dispatching, processors, access methods, job control languages, main storage management. Batch processing, multiprogramming, multiprocessing, time sharing.

COMP 330 THEORETICAL ASPECTS: COMPUTER SCIENCE. (3) (3 hours) (Prerequisite: COMP 251.) (Restriction Note: I) Mathematical models of computers, finite automata, Turing machines, counter machines, push-down machines, computational complexity.

COMP 335 SOFTWARE ENGINEERING METHODS. (3) (Winter) (3 hours) (Corequisite: COMP 302) This course in software engineering teaches basic concepts and methods for software development. The focus is on engineering and analysing requirements, design and code. Small software development exercises will be given where students would learn how to apply different methods.

COMP 350 NUMERICAL COMPUTING. (3) (Fall) (3 hours) (Prerequisites: MATH 222 and MATH 223 and one of: COMP 202, COMP 208, COMP 250; or equivalents.) (Restriction Note: I) Computer representation of numbers, IEEE Standard for Floating Point Representation, computer arithmetic and rounding errors. Numerical stability. Matrix computations and software systems. Polynomial interpolation. Least-squares approximation. Iterative methods for solving a nonlinear equation. Discretization methods for integration and differential equations.

COMP 360 ALGORITHM DESIGN TECHNIQUES. (3) (Fall and Winter) (3 hours) (Prerequisite: COMP 251) (Not open to students who have taken or are taking COMP 362.) (Restriction Note E, I) A study of techniques for the design and analysis of algorithms.

COMP 362 HONOURS ALGORITHM DESIGN. (3) (Winter) (Prerequisite: COMP 252) (Not open to students who have taken or are taking COMP 360.) Basic algorithmic techniques, their applications and limitations. Problem complexity, how to deal with problems for which no efficient solutions are known.

COMP 400 TECHNICAL PROJECT AND REPORT. (3) (Fall and Winter) (Prerequisites: 15 Computer Science credits. For Honours students) A computer related project, typically a programming effort, along with a report will be carried out in cooperation with a staff member in the School of Computer Science.

COMP 409 CONCURRENT PROGRAMMING. (3) (Fall) (Prerequisites: COMP 251, COMP 302, and COMP 310 or ECSE 427) (Restriction Note: I) Characteristics and utility of concurrent programs; formal methods for specification, verification and development of concurrent programs; communications, synchronization, resource allocation and management, coherency and integrity.

COMP 420 FILES AND DATABASES. (3) (Fall) (Prerequisite: COMP 302) (Restriction Note: I) Language essentials for file processing; sequential files; sorting, updating, tree files; direct files; files of structured data; basics of relational databases.

COMP 421 DATABASE SYSTEMS. (3) (Winter) (3 hours) (Prerequisites: COMP 206, COMP 251, COMP 302) (Restriction Note: I) The relational model of databases, an introduction to object-oriented concepts. Relational algebra, conceptual design of databases, concurrency control issues and databases.

COMP 423 DATA COMPRESSION. (3) (Winter) (3 hours) (Prerequisites: COMP 251, MATH 223, MATH 323) Information Theory. Huffman, arithmetic and dictionary codes. Context Modelling. Lossy compression and quantization. Signal processing. Applications to text, image, speech, audio and video data.

COMP 424 TOPICS: ARTIFICIAL INTELLIGENCE 1. (3) (Fall) (3 hours) (Prerequisites: COMP 206, COMP 251, COMP 302) (Restriction Note: J) Introduction to search methods in AI problems. Mechanical theorem-proving techniques, game playing by computers, the minimalmax alpha-beta algorithms, and heuristic approaches to state space search problems.

COMP 426 AUTOMATED REASONING. (3) (Winter) (3 hours) (Prerequisites: COMP 424; or COMP 302 with MATH 340) (Restriction Note: J) Representing and reasoning with knowledge. The case for logics. Introduction to Logic Programming and, for example, PROLOG. Introduction to some Artificial Intelligence applications of Logic Programming: Meta-interpreters, Expert Systems and their implementation, Planning, Natural Language Processing, Machine Learning.

COMP 431 ALGORITHMS AND DATA STRUCTURES. (3) (Fall) (3 hours) (Prerequisites: ECSE 222 and MATH 363) (Restriction Note: E) Advanced data structures: heaps, binary search trees, graphs, algorithmic analysis: space-time analysis, worst-case and expected complexity. Examples of searching sorting and merging. Algorithm design: divide-and-conquer, dynamic programming, greedy methods, backtracking. Algorithms: set manipulation, tree traversals. Memory management: hashing, dynamic storage allocation and garbage collection.

● **COMP 433 PERSONAL SOFTWARE ENGINEERING.** (3) (Fall) (3 hours) (Prerequisite: COMP 335)

COMP 435 BASICS OF COMPUTER NETWORKS. (3) (Winter) (3 hours) (Prerequisite: COMP 310) (COMP 435 and COMP 535 cannot both be taken for credit.) (Restriction Note: I) Exposition of the first four layers of the ISO model for computer network protocols. Socket programming. Network administration and configuration and Security issues.

COMP 490 INTRO TO PROBABILISTIC ANALYSIS ALGORITHMS. (3) (Fall) (3 hours) (Prerequisites: COMP 251 and MATH 323) Fundamental tools from probability are used to analyze algorithms. Notions covered included independence, generating functions, probability inequalities, random walks and Markov chains. Analysis of probabilistic recurrences, Las Vegas algorithms, randomized approximation algorithms, random sampling methods, Monte Carlo techniques and algorithms for combinatorial search and graph theoretic problems.

● **COMP 505 ADVANCED COMPUTER ARCHITECTURE.** (3) (Fall) (3 hours) (Prerequisites: COMP 302 and COMP 273 or equivalent)

COMP 506 ADVANCED ANALYSIS OF ALGORITHMS. (3) (Winter) (3 hours) (Prerequisite: COMP 330 or COMP 360 or COMP 405 or COMP 431) The study of computational complexity and intractability: Cook's Theorem, NP-completeness, oracles, the polynomial hierarchy, lower bounds, heuristics, approximation problems.

COMP 507 COMPUTATIONAL GEOMETRY. (3) (Fall) (3 hours) (Prerequisite: COMP 360 or COMP 405 or equivalent or corequisite COMP 506) Problems in computational geometry; worst-case complexity of geometric algorithms; expected complexity of geometric algorithms and geometric probability; geometric intersection problems; nearest neighbor searching; point inclusion problems; distance between sets; diameter and convex hull of a set; polygon decomposition; the Voronoi diagram and other planar graphs; updating and deleting from geometric structures.

COMP 520 COMPILER DESIGN. (4) (Fall) (3 hours, 1 hour consultation) (Prerequisites: COMP 273 and COMP 302) The structure of a compiler. Lexical analysis. Parsing techniques. Syntax directed

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

translation. Run-time implementation of various programming language constructs. Introduction to code generation for an idealized machine. Students will implement parts of a compiler.

COMP 522 MODELLING AND SIMULATION. (4) (Fall) (3 hours) (Prerequisites: COMP 251, COMP 302, COMP 350) Simulation and modeling processes, state automata, Petri Nets, state charts, discrete event systems, continuous-time models, hybrid models, system dynamics and object-oriented modeling.

COMP 524 THEORETICAL FOUNDATIONS OF PROGRAMMING LANGUAGES. (3) (Fall) (3 hours) (Prerequisite: COMP 302, and MATH 340 or MATH 235) Operational and denotational semantics of programming languages. Equivalence theorems for first-order languages. Lambda calculus. Type-inference, typed lambda calculus. Polymorphism. Elements of domain theory and fixed-point induction.

● **COMP 525 FORMAL VERIFICATION.** (3) (Winter) (3 hours) (Prerequisites: COMP 251, COMP 310, COMP 330 and MATH 340)

COMP 526 PROBABILISTIC REASONING AND AI. (3) (Winter) (3 hours) (Prerequisites: COMP 206, COMP 360, COMP 424 and MATH 323) Belief networks, Utility theory, Markov Decision Processes and Learning Algorithms.

COMP 531 THEORY OF COMPUTATION. (3) (Winter) (3 hours) (Prerequisite: COMP 330) Models for sequential and parallel computations: Turing machines, boolean circuits. The equivalence of various models and the Church-Turing thesis. Unsolvable problems. Model dependent measures of computational complexity. Abstract complexity theory. Exponentially and super-exponentially difficult problems. Complete problems.

● **COMP 534 TEAM SOFTWARE ENGINEERING.** (3) (Winter) (3 hours) (Prerequisite: COMP 433 or equivalent)

COMP 535 COMPUTER NETWORKS 1. (3) (Fall) (3 hours) (Prerequisite: COMP 310) (Students may not take COMP 435 and COMP 535 for credit) Exposition of the first four layers of the ISO model for computer network protocols, i.e., the physical, data, network, and transport layers. Basic hardware and software issues with examples drawn from existing networks, notably SNA, DECnet, and ARPAnet.

COMP 537 INTERNET PROGRAMMING. (3) (Winter) (3 hours) (Prerequisites: COMP 251 and COMP 302, and any one of COMP 310, COMP 420, COMP 424, or COMP 433) Sockets, User Datagram Protocol (UDP), Transmission utility protocols; Remote Terminal Protocol (Telnet), Simple Mail Transfer Protocol (SMTP), File Transfer Protocol (FTP) Hypertext Transfer Protocol (HTTP), Internet resource database and search engines. Remote File Systems. Distributed objects, Common Object Request Broker Architecture (CORBA).

● **COMP 538 PERSON-MACHINE COMMUNICATION.** (3) (Winter) (3 hours) (Prerequisites: COMP 251, COMP 302)

COMP 540 MATRIX COMPUTATIONS. (3) (Winter) (3 hours) (Prerequisite: MATH 327 or COMP 350) Designing and programming reliable numerical algorithms. Stability of algorithms and condition of problems. Reliable and efficient algorithms for solution of equations, linear least squares problems, the singular value decomposition, the eigenproblem and related problems. Perturbation analysis of problems. Algorithms for structured matrices.

COMP 547 CRYPTOGRAPHY AND DATA SECURITY. (3) (Fall) (3 hours) (Prerequisite: COMP 360) (Restriction: Not open to students who have taken 308-647) This course presents an in-depth study of modern cryptography and data security. The basic information theoretic and computational properties of classical and modern cryptographic systems are presented, followed by a cryptanalytic examination of several important systems. We will study the applications of cryptography to the security of systems.

COMP 557 COMPUTER GRAPHICS. (3) (Winter) (3 hours) (Prerequisite: MATH 223 and COMP 251) The study of fundamental mathematical, algorithmic and representational issues in computer graphics. The topics to be covered are: overview of graphics process, projective geometry, homogeneous coordinates, projective transformations, quadrics and tensors, line-drawing, surface mod-

elling and object modelling reflectance models and rendering, texture mapping, polyhedral representations, procedural modeling, and animation.

● **COMP 558 FUNDAMENTALS OF COMPUTER VISION.** (3) (Winter) (3 hours) (Prerequisites: COMP 206, COMP 360, MATH 222, MATH 223) (Restriction: not open to students who have taken 308-766 before January 2001)

COMP 560 GRAPH ALGORITHMS AND APPLICATIONS. (3) (Fall) (3 hours) (Prerequisite: COMP 360 or COMP 431 or MATH 343) Algorithms for connectivity, partitioning, clustering, colouring and matching. Isomorphism testing. Algorithms for special classes of graphs. Layout and embeddings algorithms for graphs and networks.

COMP 562 COMPUTATIONAL BIOLOGY METHODS. (3) (Fall) (3 hours) (Prerequisites: COMP 330, COMP 350, COMP 360 and MATH 323) Application of computer science techniques to problems arising in biology and medicine, techniques for modeling evolution, aligning molecular sequences, predicting structure of a molecule and other problems from computational biology.

COMP 566 DISCRETE OPTIMIZATION 1. (3) (Fall) (3 hours) (Prerequisites: COMP 360 and MATH 223) Use of computer in solving problems in discrete optimization. Linear programming and extensions. Network simplex method. Applications of linear programming. Vertex enumeration. Geometry of linear programming. Implementation issues and robustness. Students will do a project on an application of their choice.

COMP 567 DISCRETE OPTIMIZATION 2. (3) (Winter) (3 hours) (Prerequisites: COMP 566 or MATH 417) Formulation, solution and applications of integer programs. Branch and bound, cutting plane, and column generation algorithms. Combinatorial optimization. Polyhedral methods. A large emphasis will be placed on modeling. Students will select and present a case study of an application of integer programming in an area of their choice.

COMP 573 MICROCOMPUTERS. (3) (Fall or Winter) (3 hours) (Prerequisite: COMP 273) Characteristics and internal structure of microcomputers and workstations. Architectures of current CISC and RISC micro processors. Assembler and machine languages for microcomputers. System software. Applications for single and networked microcomputers. Students will be assigned "hands-on" projects.

COMP 575 FUNDAMENTALS OF DISTRIBUTED ALGORITHMS. (3) (Winter) (3 hours) (Prerequisite: COMP 310) Study of a collection of algorithms which are basic to the world of concurrent programming. Discussion of algorithms from the following areas: termination detection, deadlock detection, global snapshots, clock synchronization, fault tolerance (byzantine and self-stabilizing systems). Students will implement algorithms on the BBN butterfly and will present papers on topics in these areas.

COMP 577 DISTRIBUTED DATABASE SYSTEMS. (3) (Fall) ((3 hours)) (Prerequisites: COMP 421 and COMP 310) Issues related to distributed database both from a theoretical and practical point of view. Fundamental problems of distributed systems such as time or failure, distributed transaction management, fault-tolerance, replication, data distribution, and system architecture and design.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

EPSC – Earth and Planetary Sciences

Offered by: Department of Earth and Planetary Sciences
Former Teaching Unit Code: 186

The following courses are without prerequisite and could be taken by students in the Faculty of Arts: EPSC 200, EPSC 201, EPSC 233, and EPSC 243. Other courses assume as a prerequisite completion of the courses required in the Sciences option of the CEGEP curriculum.

EPSC 200 THE TERRESTRIAL PLANETS. (3) (Fall or Winter) (3 hours lectures) A comparative survey of the planets of our solar system with an emphasis on the terrestrial planets and their implications for the Earth as a planet. Topics include: structure and origin of the solar system, meteorites, and comparisons of the terrestrial planets in terms of their rotational properties, magnetic fields, atmospheres, surface histories, internal structure, chemical composition, volcanism, and tectonics.

EPSC 201 UNDERSTANDING PLANET EARTH. (3) (Fall or Winter) (3 lectures; afternoon field trips) Learn about Earth's origin, its place in the solar system, its internal structure, rocks and minerals, the formation of metal and fossil fuel deposits, and the extinction of dinosaurs. Discover the impact of the volcanic eruptions, earthquakes and mountain chains on Earth's past, present and future. Explore 125 million-year-old Mount Royal.

EPSC 203 STRUCTURAL GEOLOGY 1. (3) (Winter) (2 hours lectures, 3 hours laboratory) Primary igneous and sedimentary structures, attitudes of planes and lines, stress and strain, fracturing of rocks, faulting, homogeneous strain, description and classification of folds, foliation and lineation, orthographic and stereographic projections.

EPSC 205 ASTROBIOLOGY. (3) (Winter) (3 hours lectures) (Not open to students who have taken or are taking ANAT 205) Astrobiology is the search for the origin, evolution and destiny of life in the universe. The course will provide insight into the formation and evolution of habitable worlds, the evolution of life and the biogeochemical cycles in the Earth's oceans and atmosphere, and the potential for biological evolution beyond an organism's planet of origin.

EPSC 210 INTRODUCTORY MINERALOGY. (3) (Fall) (2 hours lecture, 3 hours laboratory) Crystal chemistry and identification of the principal rock-forming and ore minerals. Elementary crystallography. Optional 2-day field trip.

EPSC 212 INTRODUCTORY PETROLOGY. (4) (Winter) (3 hours lecture, 3 hours laboratory) (Prerequisite: EPSC 210) Survey course of igneous, sedimentary and metamorphic rocks and the processes leading to their formation. Emphasis in the laboratory on hand-specimen description and classification, supplemented by thin sections.

EPSC 220 PRINCIPLES OF GEOCHEMISTRY. (3) (Fall) (2 lectures, 3 hours laboratory) (Prerequisites: EPSC 201, EPSC 210) Basic concepts in geochemistry and the application of geochemical principles of chemistry to geological subdisciplines. Particular emphasis on origin of elements, controls on their distribution in Earth and cosmos, isotopes, organic geochemistry and water chemistry. Application of phase diagrams to geology.

EPSC 221 GENERAL GEOLOGY. (3) (Fall) (2-3-4) (Open to Engineering students only.) An introductory course in physical geology designed for majors in civil and mining engineering. Properties of rocks and minerals, major geological processes, together with natural hazards and their effects on engineered structures are emphasized. The laboratory is an integral part of the course which includes rock and mineral identification, basic techniques of air-photo and geological map interpretation, and structural geology.

EPSC 225 PROPERTIES OF MINERALS. (1) (Fall) (1 hour lecture, 1 hour laboratory) (Open to Engineering students only) (Not open to students who have taken EPSC 210) Survey of the physical and chemical properties of the main mineral groups. Discussion of their relationships to the chemical composition and structure of minerals.

The practical exercises emphasize the physical and chemical properties that relate to industrial uses and environmental issues, and the identification of hand specimens.

● **EPSC 231 FIELD SCHOOL 1.** (2) (Two-week field school in May) (Two-week field school)

EPSC 233 EARTH AND LIFE HISTORY. (3) (Fall) (3 lectures) Interpretation of stratified rocks; history of Earth with special emphasis on the regions of North America; outline of the history of life recorded in fossils.

EPSC 243 ENVIRONMENTAL GEOLOGY. (3) (Fall or Winter) (3 hours lectures) Introduction to the relationship of geological processes and materials to the human environment; geologic hazards; hydrogeology; impacts of waste disposal, energy use, land resource development.

EPSC 250 NATURAL DISASTERS. (3) (Fall) (3 lectures) (Restriction: Not open to students who have taken or are taking ATOC 250) This course examines the science behind different types of disasters and our ability or inability to control and predict such events. From this course the student will gain an appreciation of natural disasters beyond the newspaper headlines, and will better understand how the effects of disasters can be reduced.

EPSC 312 SPECTROSCOPY OF MINERALS. (3) (Winter) (6 hours laboratory and relevant in-lab lectures) (Prerequisite: EPSC 210) Interaction of minerals with electromagnetic radiation. Optical mineralogy on thin and polished sections. Demonstrations of other spectroscopic techniques applied to the identification of minerals and to the analysis of their composition and structure.

EPSC 320 ELEMENTARY EARTH PHYSICS. (3) (Fall) (3 hours lectures) (Prerequisite: MATH 222) Physical properties of Earth and the processes associated with its existence as inferred from astronomy, geodesy, seismology, geology, terrestrial magnetism and thermal evolution.

● **EPSC 330 EARTHQUAKES AND EARTH STRUCTURE.** (3) (Winter) (3 hours lecture, tutorial as required) (Prerequisites: MATH 314, EPSC 320. Corequisites: MATH 319)

● **EPSC 331 FIELD SCHOOL 2.** (3) (Summer) (Two-week field school)

● **EPSC 334 INVERTEBRATE PALEONTOLOGY.** (3) (Winter) (2 lectures and one laboratory period)

EPSC 341 FIELD SCHOOL 3. (3) (Summer) (Prerequisites: EPSC 210, EPSC 203, EPSC 212 and EPSC 231 or permission of the instructor) A field school which will be given in May in alternate years to EPSC 331. The course examines sedimentary strata in the St. Lawrence low lands, igneous rocks of the Monteregean intrusions, and metamorphic rocks in the Grenville Province near Ottawa.

EPSC 350 TECTONICS. (3) (Winter) (Prerequisites: EPSC 320, Calculus 3 or equivalent) Rheology of the Earth, mechanics of the crust and mantle and core, convection in the mantle, evolution and kinematics and deformations of the oceanic and continental plates, thermal evolution of the Earth, the unifying theory of plate tectonics.

EPSC 423 IGNEOUS PETROLOGY. (3) (Winter) (2 hours lectures, 3 hours laboratory) (Prerequisites: EPSC 212, EPSC 312) Physical properties, nucleation, crystallization, differentiation and emplacement of magmas. Integrated studies on various rock suites.

EPSC 425 SEDIMENTS TO SEQUENCES. (3) (Winter) (2 lecture, 3 laboratory) (Prerequisites: EPSC 210, EPSC 212) Processes and products of modern and ancient carbonate and siliciclastic depositional environments. Sequence stratigraphy as a tool for studying the fundamental controls (sea level, tectonics, sediment supply, etc.) on stratigraphic architecture.

EPSC 435 GEOPHYSICAL APPLICATIONS. (3) (Fall) (3 hours lecture) (Prerequisites: Calculus 3, Linear Algebra and EPSC 320 or equivalents) Methods in geophysical surveying including gravity, magnetism, electromagnetism, resistivity and induced polarisation, seismology and radioactivity; applications to oil and mineral exploration and near surface environmental and hydrological targets.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

● **EPSC 445 METAMORPHIC PETROLOGY.** (3) (Winter) (Prerequisites: EPSC 212, EPSC 303, EPSC 312)

● **EPSC 451 HYDROTHERMAL MINERAL DEPOSITS.** (3) (Winter) (Prerequisite: EPSC 220)

● **EPSC 452 MINERAL DEPOSITS 2.** (3) (Fall) (Prerequisite: EPSC 312, EPSC 220)

EPSC 455 SEDIMENTARY GEOLOGY. (3) (Fall) (Prerequisites: EPSC 210, EPSC 212) This course discusses the origin, diagenesis, classification and economic importance of sedimentary rocks. Students will learn about the physical properties of sedimentary rocks, including porosity and permeability, different techniques for analyzing those rocks (thin sections, hand specimens, wireline logs) and the types of sedimentary basins within which sediments accumulate.

EPSC 480D1 HONOURS RESEARCH PROJECT. (3) (Fall) (For Honours students in 3rd year) (Students must also register for EPSC 480D2) (No credit will be given for this course unless both EPSC 480D1 and EPSC 480D2 are successfully completed in consecutive terms) A written proposal outlining the studies to be undertaken must be submitted to the undergraduate Student Adviser by May 1st of the U-2 year. The proposal will be reviewed by a committee and a decision forwarded by mail. If approved the investigation will be supervised by a staff member, and the results must be presented in the form of an undergraduate thesis.

EPSC 480D2 HONOURS RESEARCH PROJECT. (3) (Winter) (Prerequisite: EPSC 480D1) (No credit will be given for this course unless both EPSC 480D1 and EPSC 480D2 are successfully completed in consecutive terms) See EPSC 480D1 for course description.

EPSC 482 INDEPENDENT STUDIES 1. (3) (Fall or Winter) (May not be taken concurrently with EPSC 480) Research and/or reading project in Earth and Planetary Sciences, designed by the student in consultation with a Faculty supervisor. A statement of the proposed project and the method of evaluation must be approved by the Director of Undergraduate studies before October 15. This statement will be included in the student's file.

● **EPSC 482D1 INDEPENDENT STUDIES 1.** (1.5) (Fall) (Students must also register for EPSC 482D2)

● **EPSC 482D2 INDEPENDENT STUDIES 1.** (1.5) (Winter) (Prerequisite: EPSC 482D1)

● **EPSC 483D1 INDEPENDENT STUDIES 2.** (1.5) (Fall) (To be taken concurrently with 182-500) (Students must also register for EPSC 483D2)

● **EPSC 483D2 INDEPENDENT STUDIES 2.** (1.5) (Winter) (Prerequisite: EPSC 483D1)

EPSC 501 CRYSTAL CHEMISTRY. (3) (Winter) (2 hours lectures, 1 hour seminar) (Prerequisite: CHEM 203 or CHEM 213) Discussion of crystal structures and compositions of important mineral groups, especially oxides, sulphides and silicates. Solid solution. Relation of structure to morphology and to chemical and physical properties of the rock-forming minerals.

EPSC 510 GEODYNAMICS AND GEOMAGNETISM. (3) (Fall) (3 lecture) (Prerequisites: EPSC 320, MATH 319 or permission of the instructor. Corequisite: EPSC 350) The gravity field of the Earth and planets, body and orbital dynamics the Earth, moon and planets, tidal interactions of the Earth-moon-sun system, deformation of the Earth under static and dynamic loads, the magnetic field of the Earth and planets: the magnetosphere, the external radiation belts, magnetohydrodynamic models of the core dynamo, geochemical convection in the core, fluid dynamic motions of the outer core, dynamics of the inner core.

● **EPSC 519 ISOTOPE GEOLOGY.** (3) (Fall) (3 lectures) (Prerequisites: U2 core program)

EPSC 525 SUBSURFACE MAPPING. (3) (Winter) (Prerequisites: EPSC 455 or permission of instructor) This course will provide participants the opportunity to learn how different types of data (wireline logs, seismic, etc.) are employed to map geological features in the subsurface. Lectures will teach participants about the physical basis of each of the data types, and the basic mapping and analytical

techniques (e.g., geostatistics, gridding) that are employed in subsurface mapping. The principal focus will be on applying these techniques and concepts to real-world data sets.

EPSC 530 VOLCANOLOGY. (3) (Fall) (2 hours lecture, 3 hours laboratory) (Prerequisites: EPSC 212 and EPSC 312, or permission of instructor) The physical mechanisms which drive volcanoes and volcanic activity are presented. Descriptive, practical and theoretical approaches to the study of volcanoes are discussed.

EPSC 542 CHEMICAL OCEANOGRAPHY. (3) (Fall) (Prerequisites: CHEM 213, CHEM 257 or equivalents, or registration in Graduate Program in Oceanography) History of chemical oceanography. Seawater composition and definition of salinity/chlorinity. Minor and trace-element distribution in the ocean. Geochemical mass balance. Dissolved gases in sea water. CO₂ and the carbonate system. Chemical speciation. Physical chemistry of seawater. Organic matter and the carbon cycle in the marine environment. Sediment geochemistry.

EPSC 547 HIGH-TEMPERATURE GEOCHEMISTRY. (3) (Fall) (2 hours lectures, 3 hours laboratory) (Prerequisites: CHEM 203, CHEM 204 or CHEM 213, or permission of instructor) The application of thermodynamic principles to igneous and metamorphic petrology and economic geology. Topics include but are not restricted to: solid solutions in minerals, behaviour of geological fluids, phase equilibria, flow processes, estimation of thermodynamic data.

EPSC 548 PROCESSES OF IGNEOUS PETROLOGY. (3) (Fall) (2 hours lecture, 1 hour seminar) (Prerequisite: EPSC 423) Investigation of the primary mechanisms causing the diversity of igneous rock compositions on the Earth, other planets, asteroids, and meteorite parent bodies.

● **EPSC 549 HYDROGEOLOGY.** (3) (Winter) (3 hours lecture, 1-2 hours laboratory) (Prerequisite: permission of the instructor)

EPSC 550 SELECTED TOPICS 1. (3) (Fall or Winter) (2 hours seminar, permission of department undergraduate advisor) Research seminar and/or lecture with readings in topics concerning aspects of current interests in Earth & Planetary Sciences.

EPSC 551 SELECTED TOPICS 2. (3) (Fall or Winter) (2 hours seminar, permission of department undergraduate advisor) Research seminar and/or lecture with readings in topics concerning aspects of current interest in Earth & Planetary Sciences.

EPSC 552 SELECTED TOPICS 3. (3) (Fall or Winter) (2 hours seminar, permission of department undergraduate advisor) Research seminar and/or lecture with readings in topics concerning aspects of current interest in Earth & Planetary Sciences.

EPSC 561 ORE-FORMING PROCESSES 1. (3) (Prerequisite: One course in ore petrology (EPSC 451 or EPSC 452) or permission of the instructor) Physicochemical controls of hydrothermal mineral deposition. Discussion of fluid inclusion theory and application; stable isotope systematics, wall-rock alteration; ore mineral solubility and speciation; and mechanisms of mineral deposition.

EPSC 562 ORE-FORMING PROCESSES 2. (3) (Prerequisite: One course in mineral deposits (EPSC 451 or EPSC 452) or permission of the instructor) Genesis of hydrothermal mineral deposits. Discussion of geological setting, fluid and metal sources, method of metal transport, and factors controlling metal concentration for a selection of hydrothermal mineral deposit types.

EPSC 570 COSMOCHEMISTRY. (3) (Fall) (3 hours lecture) (Prerequisites: EPSC 220, EPSC 210 or permission of instructor) Examines the implications of phase equilibria and the compositions of meteorites and the solar system for the formation and internal differentiation of the terrestrial planets and the nature of chemical fractionation processes in both planetary interiors and the solar system as a whole.

● **EPSC 580 AQUEOUS GEOCHEMISTRY.** (3) (Winter) (3 hours lecture) (Prerequisites: EPSC 210, EPSC 212 or permission of instructor)

EPSC 590 APPLIED GEOCHEMISTRY SEMINAR. (3) (Winter) (3 hours seminar) (Prerequisite: permission of instructor) Seminar course devoted to field case studies that illustrate the applications of geo-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

chemical principles to solving geologic problems. Each student will prepare and lead a class devoted to a geochemical subject of their own choosing.

EXMD – Experimental Medicine

Offered by: Department of Medicine
Former Teaching Unit Code: 516

EXMD 401 PHYSIOLOGY AND BIOCHEMISTRY ENDOCRINE SYSTEMS. (3) (Winter) (Prerequisite: BIOL 200 and BIOL 201) Offered in conjunction with the Department of Physiology. The course provides a basic knowledge of endocrine systems encompassing biosynthesis, metabolism and physiological actions of hormones. Specific topics covered are hormones of the hypothalamus, pituitary, adrenals, thyroids, parathyroids, pancreas, gut and the gonads. The role of hormones and growth factors in pregnancy and fetal development are also discussed.

EXMD 502 ADVANCED ENDOCRINOLOGY. (3) (Fall) (Prerequisite: EXMD 301 or an equivalent course) This course is designed for U3 students who are in a major or honours program in anatomy, biology, biochemistry or physiology and for graduate students. A multidisciplinary approach will be used to teach biosynthesis and processing of hormones, their regulation, function and mechanism of action. The material will cover hypothalamic, pituitary, thyroid, atrial and adrenal hormones as well as prostaglandins and related substances.

EXMD 503 ADVANCED ENDOCRINOLOGY. (3) (Winter) Study of the parathyroids, gut and pancreatic hormones and growth factors. In addition, the role of hormones and growth factors in reproduction and fetal maturation will be discussed.

EXMD 504 BIOLOGY OF CANCER. (3) (Fall) (Prerequisite: A good knowledge of biology at the cellular and molecular level. Open to U3 and graduate students only) An introduction to the biology of malignancy. A multidisciplinary approach dealing with the etiology of cancer, the biological properties of malignant cells, the host response to tumour cell growth and the principles of cancer therapy.

EXMD 506 ADVANCED APPLIED CARDIOVASCULAR PHYSIOLOGY. (3) (Winter) (Prerequisite: PHGY 313 or by permission of Instructors) Offered in conjunction with the Department of Physiology. Current topics, methods and techniques for studying the cardiovascular system. Basic and applied cardiac electrophysiology, mechanisms of pacemaker activity, arrhythmias, the effects of drugs on cardiac functions, fetal circulation, coronary circulation, mechanics of blood flow, cardiovascular diseases, renal and neural control of the circulation, and cardiac assist devices.

EXMD 507 ADVANCED APPLIED RESPIRATORY PHYSIOLOGY. (3) (Fall) (Prerequisite: PHGY 313) Offered in conjunction with the Department of Physiology. In depth coverage of respiratory biology including: functional anatomy of the respiratory system, pulmonary statics and dynamics, chest wall and respiratory muscles, ventilation and perfusion, control of breathing, and defense mechanisms. This course is aimed at providing a solid grounding in pulmonary biology and its research applications.

EXMD 508 ADVANCED TOPICS IN RESPIRATION. (3) (Winter) (Prerequisite: EXMD 507) Offered in conjunction with the Department of Physiology. In depth coverage of developmental physiology, pulmonary vascular physiology, biology of airway smooth muscle, respiratory epithelium and molecular biology of respiratory muscles. Dyspnea, mechanical ventilation and respiratory failure will also be covered. This course emphasizes application of respiratory biology to basic and applied research and touches on pulmonary pathophysiology.

EXMD 509 GASTROINTESTINAL PHYSIOLOGY AND PATHOLOGY. (3) (Fall and Winter) (Prerequisite: Graduate students, U3 undergraduates) Course deals with various aspects of gastrointestinal and hepatic function in health and altered physiological states. The principal focus is on the recent literature pertaining to cell and molecular mechanisms underlying the motility secretory process,

absorption and secretion. The molecular biology of the hepatic viruses and various aspects of colonic neoplasia will also be considered.

EXMD 510 BIOANALYTICAL SEPARATION METHODS. (3) (Fall) The student will be taught the capabilities and limitations of modern separation methods (gas and high-performance liquid chromatography, capillary electrophoresis, hyphenated techniques). Application of these techniques to solve analytical problems relevant to biomedical research will be emphasized, with special attention being paid to the processing of biological samples.

EXMD 511 JOINT VENTURING WITH INDUSTRY. (3) (Winter) (Offered in conjunction with the Centre for Continuing Education) Using problem-based learning, the course examines the various business interactions between researchers and their business partners in support and development of research into commercial endeavours using models such as venture capital, business partnerships, or grants-in-aid.

GEOG – Geography

Offered by: Department of Geography
Former Teaching Unit Code: 183

GEOG 199 FYS: GEO-ENVIRONMENTS. (3) (Fall) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25. Closed to Geography Majors) Geography studies the complex but crucial relationships between people and their physical and socio-cultural environments. The course is constructed around field trips and preparatory seminars which provide an opportunity for students to learn about a variety of physical environments and their utilisation.

GEOG 200 GEOGRAPHICAL PERSPECTIVES: WORLD ENVIRONMENTAL PROBLEMS. (3) (Fall) (3 hours) Introduction to geography as the study of nature and human beings in a spatial context. An integrated approach to environmental systems and the human organization of them from the viewpoint of spatial relationships and processes. Special attention to environmental problems as a constraint upon Third World development.

GEOG 201 INTRODUCTORY GEO-INFORMATION SCIENCE. (3) (Fall) (3 hours and lab) An introduction to Geographic Information Systems. The systematic management of spatial data. The use and construction of maps. The use of microcomputers and software for mapping and statistical work. Air photo and topographic map analyses.

GEOG 202 STATISTICS AND SPATIAL ANALYSIS. (3) (Winter) (2.5 hours and lab) (Restriction: Credit for other statistics courses may preclude credit for this course and conversely.) Exploratory data analysis, univariate descriptive and inferential statistics, non-parametric statistics, correlation and simple regression. Problems associated with analysing spatial data such as the 'modifiable areal unit problem' and spatial autocorrelation. Statistics measuring spatial pattern in point, line and polygon data.

GEOG 203 ENVIRONMENTAL SYSTEMS. (3) (Fall) (3 hours) (Restriction: Because of quantitative science content of course, not recommended for B.A. and B.Ed. students in their U0 year.) An introduction to system-level interactions among climate, hydrology, soils and vegetation at the scale of drainage basins, including the study of the global geographical variability in these land-surface systems. The knowledge acquired is used to study the impact on the environment of various human activities such as deforestation and urbanisation.

GEOG 205 GLOBAL CHANGE: PAST, PRESENT AND FUTURE. (3) (Winter) (3 hours) An examination of global change, from the Quaternary Period to the present day involving changes in the physical geography of specific areas. Issues such as climatic change and land degradation will be discussed, with speculations on future environments.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

GEOG 210 GLOBAL PLACES AND PEOPLES. (3) (Winter) (3 hours) Introduction to key themes in cultural and political geography. Maps and the making, meanings, and contestation of landscapes, 'place', and territory. Focuses on human-environmental interactions and the changing geographies of population, ethnic and linguistic identity, gender, religion, politics, land use, and natural resource conflict.

GEOG 216 GEOGRAPHY OF THE WORLD ECONOMY. (3) (Fall) (3 hours) The course introduces the geography of the world economic system. It describes the spatial distribution of economic activities and examines the factors which influence their changing location. Case studies from both "developed" and "developing" countries will test the different geographical theories presented in lectures.

GEOG 217 THE CANADIAN CITY. (3) (Winter) (3 hours) An introduction to the social, economic, political and built environments of Canadian cities. Theories of the internal structure of cities, and relationships between urban places of various sizes. The course situates Canadian urbanism in the North American context, and emphasizes social and economic processes distinctive to Montreal.

GEOG 272 EARTH'S CHANGING SURFACE. (3) (Winter) (3 hours) Introduction to the study of landforms as products of geomorphic and geologic systems acting at and near the Earth's surface. The process geomorphology approach will be used to demonstrate how landforms of different geomorphic settings represent a dynamic balance between forces acting in the environment and the physical properties of materials present.

GEOG 290 LOCAL GEOGRAPHICAL EXCURSION. (1) (Fall) (1 credit) (Open to first-year Geography Major and Honours students only. Not open to students who have taken GEOG 199) Introduction to landscape interpretation and geographical site analysis in physical and human geography. A three-day fall excursion with preparatory and concluding seminars. September 19-21, 2003.

GEOG 300 HUMAN ECOLOGY IN GEOGRAPHY. (3) (Winter) (3 hours) (Prerequisite: GEOG 203 or ANTH 202 or BIOL 111) The course will examine research approaches in human ecology since its inception early in this century. Emphasis will be placed on the theoretical shifts that have led to its emergence as an important social science perspective. The course will also involve case studies to evaluate the methodological utility of the approach.

GEOG 301 GEOGRAPHY OF NUNAVUT. (3) (Fall) (3 hours) An introduction to the physical and cultural geography of Canada's newest territory. The course will emphasize the bio-physical heterogeneity of the natural environment and the cultural and political ecology of the human population.

GEOG 302 ENVIRONMENTAL MANAGEMENT 1. (3) (Fall) (3 hours) (Prerequisite: Any 200-level course in Geography or MSE or BIOL 208 or permission of instructor.) An ecological analysis of the physical and biotic components of natural resource systems. Emphasis on scientific, technological and institutional aspects of environmental management. Study of the use of biological resources and of the impact of individual processes.

GEOG 303 HEALTH GEOGRAPHY. (3) (Fall) (Prerequisite: One of the following: GEOG 201, GEOG 203, GEOG 210, GEOG 216, GEOG 217; or permission of instructor) Discussion of the research questions and methods of health geography. Particular emphasis on health inequalities at multiple geographic scales and the theoretical links between characteristics of places and the health of people.

GEOG 305 SOILS AND ENVIRONMENT. (3) (Fall) (2 hours and laboratory) (Prerequisite: GEOG 203 or introductory course in biology or geology) Discussion of the major properties of soils; soil formation, classification and mapping; land capability assessment; the role and response of soils in natural and disturbed environments (e.g. global change, ecosystem disturbance).

GEOG 306 RASTER GEO-INFORMATION SCIENCE. (3) (Winter) (2 hours and laboratory) (Prerequisite: GEOG 201) Formal introduction to a computer-based Geographical Information System (GIS). Topics will focus on map analysis and on transforming and display-

ing spatial data. GIS will be used by students to solve problems in both physical and human geography.

GEOG 307 SOCIOECONOMIC APPLICATIONS OF GIS. (3) (Winter) (2 hours and laboratory) (Prerequisites: GEOG 201, MATH 203 or equivalent) GIS applied to the spatial analysis of socioeconomic and market data. Topics include geographic market segmentation, geodemographics, spatial decision-support systems and modelling applications of GIS. Empirical focus is on analysing spatial patterns of population and consumption characteristics in cities and on facility location problems. Emphasis on visualization and problem solving.

GEOG 308 PRINCIPLES OF REMOTE SENSING. (3) (Fall) (3 hours and laboratory periods) (Restriction: Not open to students who have taken or are taking ATOC 308) A conceptual view of remote sensing and the underlying physical principles are presented. Ground-based and satellite systems and the various components of the acoustic and electromagnetic spectrum - from visible to microwave - are discussed. Substantial emphasis is devoted to the application of remote sensed data in geography and atmospheric sciences.

GEOG 309 GEOGRAPHY OF CANADA. (3) (Fall) (3 hours) (Cross-listed with CANS 300) An introduction to the geography of Canada. A comprehensive geographical interpretation of Canada's salient physical and human characteristics, including landscapes and their evolution, climate, vegetation, society/land relationships and socio-economic attributes of the population.

GEOG 311 CANADA - A GEO-ECONOMIC PERSPECTIVE. (3) (Winter) (3 hours) (Prerequisite GEOG 216 or permission of the instructor) A geographic interpretation of the Canadian economy and its regional and sectoral elements. The course provides an overview of the key theories and approaches to understanding Canada's economic geography, focusing on the specific geo-economic features of Canada's regions and their interaction with the global economy.

GEOG 315 URBAN TRANSPORTATION GEOGRAPHY. (3) (Winter) (3 hours) (Prerequisite GEOG 217 or permission of instructor) Discusses the urban transportation problem and proposed solutions from a geographic perspective. Specific topics include an analysis of the land use-transportation system in North American cities; its social environmental impacts; the analysis of urban travel behaviour; and the geographical implications of various policy alternatives.

● **GEOG 316 POLITICAL GEOGRAPHY.** (3) (3 hours)

GEOG 321 CLIMATIC ENVIRONMENTS. (3) (Winter) (3 hours) (Prerequisite: GEOG 203 or ATOC 210 or permission of the instructor) Scope of climatology, physical, dynamic and applied. The Earth/atmosphere system, radiation and energy balances, governing meteorological processes. Movement and circulation of the atmosphere on a local and global scale. Resulting weather systems.

GEOG 322 ENVIRONMENTAL HYDROLOGY. (3) (Winter) (3 hours) (Prerequisite: GEOG 203 or equivalent) Quantitative, experimental study of the principles governing the movement of water at or near the Earth's surface and how the research relates to the chemistry and biology of ecosystems.

GEOG 331 URBAN SOCIAL GEOGRAPHY. (3) (Fall) (3 hours) (Prerequisite: GEOG 216 or GEOG 217 or permission of instructor) Social space and social time. The reflection of social structure in the spatial organization of the city. Historical perspective on changing personal mobility, life cycle, family structure and work organization. The appropriation and alienation of urban spaces.

GEOG 350 ECOLOGICAL BIOGEOGRAPHY. (3) (Fall) (3 hours) (Prerequisite: GEOG 203 or ENVR 200 or ENVR 202) The study of the patterns of distribution of organisms in space and time with emphasis on plant communities. Ecological, geographical, historical and anthropological factors affecting these distribution patterns will be discussed. Particular consideration is given to methods for description and classification of plant communities.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

GEOG 351 QUANTITATIVE METHODS. (3) (Fall) (3 hours) (Prerequisite: MATH 203 or permission of instructor) (Credit for other statistics courses may preclude credit for this course conversely. See "Course Overlap" under "Course Requirements") Multiple regression and correlation, logit models, discrete choice models, gravity models, facility location algorithms, survey design, population projection.

● **GEOG 372 RUNNING WATER ENVIRONMENTS.** (3) (Fall) (3 hours) (Prerequisites: GEOG 203 and GEOG 272, or ENVR 200 and ENVR 202)

GEOG 381 GEOGRAPHIC THOUGHT AND PRACTICE. (3) (Fall) (3 hours) An overview of the philosophy of geography and its emergence as a discipline nationally and internationally with emphasis on current concepts and their application to geographical studies in local field work analyzing the impact of human environmental interactions.

GEOG 404 ENVIRONMENTAL MANAGEMENT 2. (3) (Winter) (3 hours) (Prerequisite: GEOG 302 or permission of instructor) Practical application of environmental planning, analysis and management techniques with reference to the needs and problems of developing areas. Special challenges posed by cultural differences and traditional resource systems are discussed. This course involves practical field work in a developing area (Kenya or Panama).

GEOG 407 ISSUES IN GEOGRAPHY. (3) (Winter) (3 hours) Treatment of contemporary issues in geographical research focusing on human-environmental relations and interactions. Instructor(s) and topics will be announced each term the course is given.

GEOG 408 GEOGRAPHY OF DEVELOPMENT. (3) (Fall) (3 hours) (Prerequisite: GEOG 210 or GEOG 216 or permission of instructor) Examines the geographical dimensions of development policy, specifically the relationships between the process of development and human-induced environmental change. Focuses on environmental sustainability, struggles over resource control, population and poverty, and levels of governance (the role of the state, non-governmental organizations, and local communities).

GEOG 410 GEOGRAPHY OF UNDERDEVELOPMENT: CURRENT PROBLEMS. (3) (Winter) (3 hours) (Prerequisite: GEOG 216 or permission of instructor) An examination of the cultural, political, and economic mechanisms and manifestations of contemporary underdevelopment and the response to it from different regional and national peripheral societies within the dominant world economic system.

● **GEOG 416 AFRICA SOUTH OF THE SAHARA.** (3)

● **GEOG 424 EUROPE: PLACES AND PEOPLES.** (3) (Winter) (6 hours) (Prerequisite: At least one 300-level course in geography, anthropology, history, political science, sociology or permission of instructor.)

GEOG 490 GEOGRAPHY: INDEPENDENT STUDIES. (3) (Fall and Winter and Summer) (Open to U3 Geography Major students only) (Please see regulations concerning "Project Courses" in the Faculty Degree Requirements section) Research or reading projects permitting independent study under the guidance of a staff member specializing in the field of interest. A project must be arranged with an instructor before registration.

GEOG 490D1 GEOGRAPHY: INDEPENDENT STUDIES. (1.5) (Fall) (Students must also register for GEOG 490D2) (No credit will be given for this course unless both GEOG 490D1 and GEOG 490D2 are successfully completed in consecutive terms) (GEOG 490D1 and GEOG 490D2 together are equivalent to GEOG 490) Research or reading projects permitting independent study under the guidance of a staff member specializing in the field of interest. A project must be arranged with an instructor before registration.

GEOG 490D2 GEOGRAPHY: INDEPENDENT STUDIES. (1.5) (Winter) (Prerequisite: GEOG 490D1) (No credit will be given for this course unless both GEOG 490D1 and GEOG 490D2 are successfully completed in consecutive terms) (GEOG 490D1 and GEOG 490D2 together are equivalent to GEOG 490) See GEOG 490D1 for course description.

GEOG 491D1 HONOURS RESEARCH. (3) (Fall) (Prerequisite: 183-381) (For U3 B.A. and B.Sc. Honours and Joint Honours Geography students) (Students must also register for GEOG 491D2) (No credit will be given for this course unless both GEOG 491D1 and GEOG 491D2 are successfully completed in consecutive terms) Supervised reading, research and preparation of an undergraduate thesis under the direction of a member of staff.

GEOG 491D2 HONOURS RESEARCH. (3) (Winter) (Prerequisite: GEOG 491D1) (No credit will be given for this course unless both GEOG 491D1 and GEOG 491D2 are successfully completed in consecutive terms) See GEOG 491D1 for course description.

Also offered as:

GEOG 491N1 HONOURS RESEARCH. (3) (Winter)

GEOG 491N2 HONOURS RESEARCH. (3) (Fall)

GEOG 492D1 JOINT HONOURS RESEARCH. (1.5) (Fall) (Only for those U3 Joint Honours students in Geography who opt to enrol in a parallel course in another department) (Students must also register for GEOG 492D2) (No credit will be given for this course unless both GEOG 492D1 and GEOG 492D2 are successfully completed in consecutive terms) Supervised reading, research and preparation of an undergraduate thesis under the direction of a member of staff.

GEOG 492D2 JOINT HONOURS RESEARCH. (1.5) (Winter) (Prerequisite: GEOG 492D1) (No credit will be given for this course unless both GEOG 492D1 and GEOG 492D2 are successfully completed in consecutive terms) See GEOG 492D1 for course description.

Also offered as:

GEOG 492N1 JOINT HONOURS RESEARCH. (1.5) (Winter)

GEOG 492N2 JOINT HONOURS RESEARCH. (1.5) (Fall)

GEOG 494 URBAN FIELD STUDIES. (3) (Winter) (Prerequisites: One of the following: GEOG 201, GEOG 203, GEOG 210, GEOG 216, GEOG 217, GEOG 272, or permission of instructor.) Geographical research in urban public and semi-public spaces. Demonstration of techniques of mapping, sampling, measurement, photography, interviewing. Attention to research design.

GEOG 495 FIELD STUDIES - PHYSICAL GEOGRAPHY. (3) (Summer) (2-week field school) (Prerequisites: 6 credits from the following list of Systematic Physical Geography courses: GEOG 305, GEOG 321, GEOG 322, GEOG 350, GEOG 372) Field research projects in physical geography. Held locally in Monteregian or Eastern Township regions. The course is organised around field projects designed to formulate and test scientific hypotheses in a physical geography discipline. May summer session. Preregistration in Department required by March 14.

GEOG 496 GEOGRAPHICAL EXCURSION. (3) (Winter) (Prerequisites: GEOG 290 and permission of instructor) (Barbados in 2004) Lecture course on the geography of a region and excursion through the selected country or region including landscape interpretation and field study projects.

GEOG 497 ECOLOGY OF COASTAL WATERS. (3) (Fall) (Students must register for a full semester of studies in the Bay of Fundy Field Semester. Enrolment is limited to 26.) (Exclusion: BIOL 542/BIOL 442) (Prerequisite: (GEOG 203 or ENVR 200) and (GEOG 350 or BIOL 208 or AEBI 205)) Study of ecology of coastal habitats such as salt marshes, rocky coasts, mud-flats, and shallow water environment of Eastern Canada. Emphasis on processes and factors critical to sustaining resources harvested from coastal ecosystems.

GEOG 498 HUMANS IN TROPICAL ENVIRONMENTS. (3) (Winter) (6 hours lecture for 4 weeks, 3 hours seminar, 2 hours laboratory, 8 hours conference) (Restriction: Location in Panama. Student must register for a full semester of studies in Panama) (Prerequisites: HISP 218, MATH 203 or equivalents) Focus on understanding of inter-relations between humans and neotropical environments represented in Panama. Study of contemporary rural landscapes, their origins, development and change. Impacts of economic growth and inequality, social organization, and politics on natural resource use and environmental degradation. Site visits and field exercises in peasant/colonist, Amerindian, and plantation communities.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

GEOG 499 SUBARCTIC FIELD STUDIES. (3) (Fall) (Prerequisite: GEOG 203 or GEOG 301) An introduction to the geography of the subarctic with emphasis on the application of field methods in physical and/or human geography. The course will be given in 2002 at the McGill Subarctic Research Station, Schefferville, during ten days in late August. Preregistration in Department required by March 14; registration by first week in July.

GEOG 500 GEOGRAPHY OF REGIONAL IDENTITY. (3) (Fall) (3 hours) (Restriction: Graduate students and final year undergraduates and/or those who have taken GEOG 408) The response of diverse regional groups in Europe to the centripetal tendencies of national institutions. The course draws upon examples from a variety of European regions. Contemporary regional issues will be contextualised within a spatial framework of historical geography.

GEOG 501 MODELLING ENVIRONMENTAL SYSTEMS. (3) (Fall) (1.15 hours lecture, 0.58 hours seminar, 0.69 hours project, 0.58 hours laboratory) (Restriction: open only to U2 or U3 students who have completed six or more credits from courses at the 300 level of Atmospheric and Oceanic Sciences, Biology, Chemistry, Earth and Planetary Sciences, Geography, Natural Resource Sciences, or a McGill School of Environment domain, or permission of the instructor) (Prerequisites: MATH 139 or MATH 140, MATH 141, and MATH 203, or equivalent) (Enrolment limited to 20 students by availability of workstations) Most problems in environmental science deal with weak relationships and poorly defined systems. Model development and simulation will be used in this course to help improve understanding of environmental systems. Simulation of environmental systems is examined, focusing on problem definition, model development and model validation.

GEOG 502 GEOGRAPHY OF NORTHERN DEVELOPMENT. (3) (Fall) (3 hours) (Prerequisite: GEOG 301 or GEOG 436, or permission of instructor) Analysis of the evolution of development policies and their spatial implications in circumpolar areas with an emphasis on the application of geographical concepts. Special attention is given to indigenous peoples and new immigrant populations in northern North America.

● **GEOG 503 METHODS OF REGIONAL ANALYSIS.** (3) (Winter) (3 hours) (Prerequisite: GEOG 311)

● **GEOG 504 INDUSTRIAL RESTRUCTURING - GEOGRAPHIC IMPLICATIONS.** (3) (Fall) (Prerequisites: GEOG 311 or permission of instructor)

GEOG 505 GLOBAL BIOGEOCHEMISTRY. (3) (Winter) (2 hours and research) (Prerequisite: GEOG 305 or GEOG 322 and permission of instructor) An examination of the storage, transfers and cycling of major elements and substances, with an emphasis on the global scale and the linkages between the atmosphere, hydrosphere, lithosphere and biosphere.

GEOG 506 PERSPECTIVES ON GEOGRAPHIC INFORMATION ANALYSIS. (3) (Winter) (2 hours and laboratory) (Prerequisite: GEOG 201 and GEOG 306 and permission of instructor) Examination of a range of applications in automated processing of spatial data. Discussion will focus on both theoretical and practical aspects of Geographic Information Systems. Topics such as resource data base structure, methods of spatial interpolation and data quality and errors are covered. The application of Geographic Information Systems such as GRASS and digital image processing routines are used to answer questions in geographical research. Individual student projects will be emphasized.

GEOG 508 RESOURCES, PEOPLE AND POWER. (3) (Fall) (3 hours) (Prerequisite: GEOG 408 or GEOG 410 or permission of instructor) Addresses how different groups of people struggle over natural resources and environmental change. Politics of conservation in resource-dependent local communities, struggles over resource access and character, questions of power, resistance, class, and gender, and to "nature" as a socially-constructed yet active player.

GEOG 510 HUMID TROPICAL ENVIRONMENTS. (3) (Winter) (3 hours) (Prerequisite: GEOG 203 or equivalent and written permission of the instructor) Focus on the environmental and human spatial relationships in tropical rain forest and savanna landscapes. Human adaptation to variations within these landscapes through time and

space. Biophysical constraints upon "development" in the modern era.

● **GEOG 513 BEHAVIOURAL GEOGRAPHY.** (3) (3 hours) (Prerequisite: a course in introductory statistics)

● **GEOG 522 ADVANCED ENVIRONMENTAL HYDROLOGY.** (3) (2 hours and 1 tutorial) (Prerequisite: GEOG 322, or permission of instructor)

GEOG 535 REMOTE SENSING AND INTERPRETATION. (3) (Winter) (3 hours) (Prerequisite: GEOG 308 and written permission of instructor) Basic photogrammetry and interpretation procedures for aircraft and space craft photography and imagery.

GEOG 536 GEOCRYOLOGY. (3) (Fall) (3 hours) (Prerequisite: GEOG 272 and any 300-level geomorphology course approved by instructor) Study of the unique geomorphic aspects of periglacial and permafrost environments. The focus will be on processes in cold climates, the impact of human activity on permafrost landscapes and potential impacts of climatic change.

● **GEOG 537 ADVANCED FLUVIAL GEOMORPHOLOGY.** (3) (Prerequisites: permission of instructor)

● **GEOG 550 QUATERNARY PALEOECOLOGY.** (3) (2 hours, laboratory and seminar) (Prerequisite: course in ecology or biogeography, or permission of instructor)

GEOG 551 ENVIRONMENTAL DECISIONS. (3) (Fall) (2 hours seminar, 1 hour tutorial) (Prerequisites: GEOG 302, GEOG 306 or equivalents) This course deals with the role of geographic information, paradigms and modes of analysis - including but not restricted to GIS - in environmental impact assessment and decision making. The focus will be on community-based decision making, particularly where conservation issues are involved. Cross-cultural situations, developing areas and the role of non-government organizations.

MATH – Mathematics and Statistics (Sci)

Offered by: Department of Mathematics and Statistics

Former Teaching Unit Code: 189

Restriction Note A: MATH 133, MATH 139, MATH 140, MATH 141, MATH 150 and MATH 151 are not open to students who have taken or are taking MATH 130 or MATH 131, except by permission of the Department of Mathematics and Statistics.

Restriction Note B: Not open to students who have taken or are taking MATH 130 or MATH 131, except by permission of the Department of Mathematics and Statistics.

MATH 111 MATHEMATICS FOR EDUCATION STUDENTS. (3) (Open only to students in the B.Ed. program, not open to students who have successfully completed CEGEP course 201-101 or an equivalent. Not available for credit with MATH 112) An overview of the nature of mathematics and its applications. Manipulative algebra, inequalities, linear and quadratic equations. Transformational geometry and symmetry. An intuitive discussion of area and volume. Sets and functions. A brief introduction to probability and statistics.

MATH 112 FUNDAMENTALS OF MATHEMATICS. (3) (Fall) (Not open to students who have taken CEGEP course 201-101) (Open only to those students who are deficient in a pre-calculus background) Equations and inequalities, graphs, relations and functions, exponential and logarithmic functions, trigonometric functions and their use, mathematical induction, binomial theorem, complex numbers.

MATH 130 MATHEMATICS FOR MANAGEMENT 1. (3) (3 hours lecture, tutorial sessions) (Restriction Note A) Linear and quadratic models. Systems of linear equations, Gaussian reduction, matrices and determinants, independence of vectors. Symmetric matrices. Input-output analysis, Markov processes. Limits, continuity, differentiation, differentials, elasticity, marginal change. Log and exponential functions. Curve sketching, asymptotes. Related rates, business and economic models. Applications to modeling and optimization.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MATH 131 MATHEMATICS FOR MANAGEMENT 2. (3) (3 hours lecture, tutorial sessions) (Prerequisite: MATH 130 or its equivalent) (Restriction Note A) (Antiderivatives, definite integral, applications to business and economics. Improper integral, probability and density functions, double integrals. Infinite series. Taylor approximation and series. Partial derivatives. Min/max problems in management. Unconstrained and constrained optimization: Lagrange multipliers and their economic interpretation. Method of least squares. Applications.

MATH 133 VECTORS, MATRICES AND GEOMETRY. (3) (Fall and Winter and Summer) (Prerequisite: a course in functions) (Not open to students who have taken MATH 221 or CEGEP objective 00UQ or equivalent.) (Restriction Note B) Systems of linear equations, matrices, inverses, determinants; geometric vectors in three dimensions, dot product, cross product, lines and planes; introduction to vector spaces, linear dependence and independence, bases; quadratic loci in two and three dimensions.

MATH 139 CALCULUS. (4) (Fall and Winter) (3 hours lecture; 2 hours tutorial) (Prerequisite: a course in functions) (Requires Departmental Approval) (Not open to students who have taken MATH 120 or CEGEP objective 00UN or equivalent. This course is intended for students with no previous knowledge of Calculus; it is not open to students who have had one term of College level Calculus) (Students continue in MATH 141) (Each Tutorial section is enrolment limited) (Restriction Note B) Review of functions and graphs. Limits, continuity, derivative. Differentiation of elementary functions. Antidifferentiation. Applications.

MATH 140 CALCULUS 1. (3) (Fall and Winter and Summer) (3 hours lecture, 1 hour tutorial) (Prerequisite: High School Calculus) (Not open to students who have taken MATH 120, MATH 122, MATH 139 or CEGEP objective 00UN or equivalent) (Restriction Note B) (Each Tutorial section is enrolment limited) Review of functions and graphs. Limits, continuity, derivative. Differentiation of elementary functions. Antidifferentiation. Applications.

MATH 141 CALCULUS 2. (4) (Fall and Winter and Summer) (3 hours lecture; 2 hours tutorial) (Not open to students who have taken MATH 121 or CEGEP objective 00UP or equivalent) (Prerequisites: MATH 139 or MATH 140 or MATH 150) (Restriction Note B) (Each Tutorial section is enrolment limited) The definite integral. Techniques of integration. Applications. Introduction to sequences and series.

MATH 150 CALCULUS A. (4) (Fall) (3 hours lecture, 2 hours tutorial) (Students with no prior exposure to vector geometry are advised to take MATH 133 concurrently. Intended for students with high school calculus who have not received six advanced placement credits) (Not open to students who have taken CEGEP objective 00UN or equivalent) (Restriction Note B) (MATH 150 and MATH 151 cover the material of MATH 139, MATH 140, MATH 141, MATH 222) Functions, limits and continuity, differentiation, L'Hospital's rule, applications, Taylor polynomials, parametric curves, functions of several variables.

MATH 151 CALCULUS B. (4) (Winter) (3 hours lecture; 2 hours tutorial) (Prerequisite: MATH 150) (Not open to students who have taken CEGEP objective 00UP or equivalent) (Restriction Note B) (Each Tutorial section is enrolment limited) Integration, methods and applications, infinite sequences and series, power series, arc length and curvature, multiple integration.

● **MATH 199 FYS: CHAOS, FRACTALS AND COMPLEXITY.** (3) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25)

MATH 203 PRINCIPLES OF STATISTICS 1. (3) (Fall and Winter) (No calculus prerequisites) (This course is intended for students in all disciplines and is not open to students in Mathematics programs; or to students who have taken or are taking MATH 324) (Credit for other statistics courses may preclude credit for this course and conversely) Examples of statistical data and the use of graphical means to summarize the data. Basic distributions arising in the natural and behavioural sciences. The logical meaning of a test of sig-

nificance and a confidence interval. Tests of significance and confidence intervals in the one and two sample setting (means, variances and proportions).

MATH 204 PRINCIPLES OF STATISTICS 2. (3) (Winter) (Prerequisite: MATH 203 or equivalent. No calculus prerequisites) (This course is intended for students in all disciplines and is not open to students in Mathematics programs; or to students who have taken or are taking MATH 324) (Credit for other statistics courses may preclude credit for this course and conversely) The concept of degrees of freedom and the analysis of variability. Planning of experiments. Experimental designs. Polynomial and multiple regressions. Statistical computer packages (no previous computing experience is needed). General statistical procedures requiring few assumptions about the probability model.

● **MATH 211 PRACTICAL METHODS OF MATHEMATICS.** (3) (Prerequisite: MATH 111 or CEGEP 101 or consent of instructor) (Not open to students in the Faculty of Science, students in Mathematics or Computer Science programs or students who have taken or are taking any of MATH 240, MATH 343, MATH 363 or any statistics course)

MATH 222 CALCULUS 3. (3) (Fall and Winter and Summer) (Prerequisite: MATH 141. Familiarity with vector geometry or Corequisite: MATH 133) (Not open to students who have taken CEGEP course 201-303 or MATH 150, MATH 151 or MATH 227) Taylor series, Taylor's theorem in one and several variables. Review of vector geometry. Partial differentiation, directional derivative. Extreme of functions of 2 or 3 variables. Parametric curves and arc length. Polar and spherical coordinates. Multiple integrals.

MATH 223 LINEAR ALGEBRA. (3) (Fall and Winter and Summer) (Prerequisite: MATH 133 or equivalent) (Not open to students in Mathematics programs nor to students who have taken or are taking MATH 236, MATH 247 or MATH 251. It is open to students in Faculty Programs) Review of matrix algebra, determinants and systems of linear equations. Vector spaces, linear operators and their matrix representations, orthogonality. Eigenvalues and eigenvectors, diagonalization of Hermitian matrices. Applications.

MATH 235 BASIC ALGEBRA. (3) (Fall) (3 hours lecture; 1 hour tutorial) (Prerequisite: MATH 133 or equivalent) Sets and relations. Rings and fields. Integers, rationals, real and complex numbers; modular arithmetic. Polynomials over a field. Divisibility theory for integers and polynomials. Linear equations over a field. Introduction to vector spaces.

MATH 236 LINEAR ALGEBRA. (3) (Winter) (Prerequisite: MATH 235) Continuation of the topics of MATH 235. Linear mappings. Matrix representation of linear mappings. Determinants. Eigenvalues and eigenvectors. Diagonalizable operators. Cayley-Hamilton theorem. Bilinear and quadratic forms. Inner product spaces, orthogonal diagonalization of symmetric matrices. Canonical forms.

MATH 240 DISCRETE STRUCTURES 1. (3) (Fall) (Corequisites: MATH 133 and MATH 222. For Major and Honours students in Computer Science only. Others only with the instructor's permission) Mathematical foundations of logical thinking and reasoning. Mathematical language and proof techniques. Quantifiers. Induction. Elementary number theory. Modular arithmetic. Recurrence relations and asymptotics. Combinatorial enumeration. Functions and relations. Partially ordered sets and lattices. Introduction to graphs, digraphs and rooted trees.

MATH 242 ANALYSIS 1. (3) (Fall) (Prerequisite: MATH 141) A rigorous presentation of sequences and of real numbers and basic properties of continuous and differentiable functions on the real line.

MATH 243 REAL ANALYSIS. (3) (Winter) (Prerequisite: MATH 242) Infinite series; series of functions; power series. The Riemann integral in one variable. A rigorous development of the elementary functions.

MATH 247 LINEAR ALGEBRA. (3) (Winter) (Prerequisite: MATH 133 or equivalent. Intended for Honours Physics and Engineering students) (Not open to students who have taken or are taking MATH 236, MATH 223 or MATH 251) Matrix algebra, determinants, sys-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

tems of linear equations. Abstract vector spaces, inner product spaces, Fourier series. Linear transformations and their matrix representations. Eigenvalues and eigenvectors, diagonalizable and defective matrices, positive definite and semidefinite matrices. Quadratic and Hermitian forms, generalized eigenvalue problems, simultaneous reduction of quadratic forms. Applications.

MATH 248 ADVANCED CALCULUS 1. (3) (Fall) (Prerequisites: MATH 133 and MATH 222 or consent of Department. Intended for Honours Mathematics, Physics and Engineering students) (Not open to students who have taken or are taking MATH 314) Partial derivatives; implicit functions; Jacobians; maxima and minima; Lagrange multipliers. Scalar and vector fields; orthogonal curvilinear coordinates. Multiple integrals; arc length, volume and surface area. Line integrals; Green's theorem; the divergence theorem. Stokes' theorem; irrotational and solenoidal fields; applications.

MATH 249 ADVANCED CALCULUS 2. (3) (Winter) (Prerequisite: MATH 248. Intended for Honours Physics and Engineering students) (Not open to students who have taken or are taking MATH 316) Functions of a complex variable; Cauchy-Riemann equations; Cauchy's theorem and consequences. Taylor and Laurent expansions. Residue calculus; evaluation of real integrals; integral representation of special functions; the complex inversion integral. Conformal mapping; Schwarz-Christoffel transformation; Poisson's integral formulas; applications.

MATH 251 ALGEBRA 2. (3) (Winter) (Prerequisites: MATH 235 or permission of the Department) (Not open to students who are taking or have taken MATH 247) Linear maps and their matrix representation. Determinants. Canonical forms. Duality. Bilinear and quadratic forms. Real and complex inner product spaces. Diagonalization of self-adjoint operators.

MATH 255 ANALYSIS 2. (3) (Winter) (Prerequisites: MATH 242 or permission of the Department) Series of functions including power series. Riemann integration in one variable. Elementary functions.

MATH 260 INTERMEDIATE CALCULUS. (3) (3-1-5) (Prerequisites: MATH 141, MATH 133 or equivalent) Review of sequences and series. Power series, Taylor's theorem and Taylor's series, computations using series. Review of vectors, lines and planes, curves and curvature, conics, polar coordinates. Surfaces. Differential calculus of several variables. Double and triple integrals.

MATH 261 DIFFERENTIAL EQUATIONS. (3) (3-1-5) (Corequisite: MATH 260) Ordinary differential equations: first order, linear second-order and higher order, linear with constant coefficients. Solution by series, by Laplace transform, and by some simple numerical methods.

MATH 265 ADVANCED CALCULUS. (3) (3-1-5) (Prerequisites: MATH 260 or MATH 222 or MATH 151 or equivalent) Implicit functions, constrained and unconstrained extrema for functions of several variables. Change of variables in multiple integrals, Jacobians, surface integrals. Scalar and vector fields, line integrals, vector operators. Green's, divergence and Stokes' theorems, applications to heat flow, electrostatics and fluid flow.

MATH 266 LINEAR ALGEBRA AND BOUNDARY VALUE PROBLEMS. (4) (4-1-7) (Prerequisites: MATH 261, MATH 265) Review of matrix algebra, vector spaces and linear transformations, eigenvalue problems and applications to systems of linear ordinary differential equations. Partial differential equations in engineering, Fourier analysis, Sturm-Liouville theory, solutions of boundary value problems in cartesian, cylindrical and spherical coordinates.

MATH 270 APPLIED LINEAR ALGEBRA. (3) (3-1-5) (Prerequisite: MATH 261) Review of matrix algebra, solution of linear equations, triangular factorization and Gaussian reduction, vector spaces, inner products, orthogonality concepts, projections, least squares. Eigenvalues and eigenvectors, diagonalization of matrices and quadratic forms, Cayley-Hamilton theorem, the exponential matrix, analytical and numerical techniques for solving linear systems of ordinary differential equations, nonlinear equations and stability.

MATH 314 ADVANCED CALCULUS. (3) (Fall and Winter and Summer) (Prerequisites: MATH 133, MATH 222) (Not open to students who have taken or are taking MATH 248) Derivative as a matrix.

Chain rule. Implicit functions. Constrained maxima and minima. Jacobians. Multiple integration. Line and surface integrals. Theorems of Green, Stokes and Gauss.

MATH 315 ORDINARY DIFFERENTIAL EQUATIONS. (3) (Fall and Winter and Summer) (Prerequisite: MATH 222. Corequisite MATH 133) (Not open to students who have taken or are taking MATH 325) First order ordinary differential equations including elementary numerical methods. Linear differential equations. Laplace transforms. Series solutions.

MATH 316 FUNCTIONS OF A COMPLEX VARIABLE. (3) (Fall) (Prerequisites: MATH 314 and MATH 243) (Not open to students who have taken or are taking MATH 249) Algebra of complex numbers, Cauchy-Riemann equations, complex integral, Cauchy's theorems. Taylor and Laurent series, residue theory and applications.

MATH 317 NUMERICAL ANALYSIS. (3) (Fall) (Prerequisites: MATH 222, COMP 202 or equivalents) Error analysis. Interpolation. Numerical solutions of equations by iteration. Numerical integration. Introduction to numerical solutions of differential equations. Programming assumed. Some lab work necessary.

MATH 318 MATHEMATICAL LOGIC. (3) (Fall) (Not open to students who are taking or have taken PHIL 210) Propositional calculus, truth-tables, switching circuits, natural deduction, first order predicate calculus, axiomatic theories, set theory.

MATH 319 PARTIAL DIFFERENTIAL EQUATIONS. (3) (Winter) (Prerequisites: MATH 223 or MATH 236, MATH 314, MATH 315) First order equations, geometric theory; second order equations, classification; Laplace, wave and heat equations, Sturm-Liouville theory, Fourier series, boundary and initial value problems.

★ **MATH 320 DIFFERENTIAL GEOMETRY.** (3) (Fall) (Prerequisites: MATH 236 or MATH 223 or MATH 247, and MATH 314 or MATH 248) Review of Euclidean geometry. Local theory of plane and space curves: the Frenet formulas. Local theory of surfaces: the first and second fundamental forms, the shape operator, the mean and Gaussian curvatures, surfaces of revolution with prescribed curvature, ruled and developable surfaces. Geodesic curves on surfaces of revolution. The Gauss-Codazzi equations, rigidity.

MATH 323 PROBABILITY THEORY. (3) (Fall and Winter) (Prerequisites: MATH 141 or equivalent. Intended for students in Science, Engineering and related disciplines, who have had differential and integral calculus) (Not open to students who have taken or are taking MATH 356) Sample space, events, conditional probability, independent events, Bayes' Theorem. Basic combinatorial probability, random variables, introductory univariate and discrete multivariate distributions. Independence. Moment generating functions. Expectation, conditional expectation. Inequalities, the weak law of large numbers, central limit theorem. Information theory. Markov chains.

MATH 324 DISTRIBUTIONS, POINT AND INTERVAL ESTIMATION, HYPOTHESIS (3) (Fall and Winter) (Prerequisite: MATH 323 or equivalent) (Not open to students who have taken or are taking MATH 357) (Credit for other statistics courses may preclude credit for this course and conversely) Nonparametric inference, regression, Bayesian inference. testing, analysis of variance, contingency tables,

MATH 325 ORDINARY DIFFERENTIAL EQUATIONS. (3) (Fall and Winter) ((3-0-6)) (Prerequisite: MATH 222. Intended for Honours Mathematics, Physics and Engineering programs.) (Not open to students who have taken MATH 261, MATH 315) First and second order equations, linear equations, series solutions, Frobenius method, introduction to numerical methods and to linear systems, Laplace transforms, applications.

★ **MATH 326 NONLINEAR DYNAMICS AND CHAOS.** (3) (Fall) (Prerequisites: MATH 222, MATH 223) (Not open to students who have taken or are taking MATH 376) Linear systems of differential equations, linear stability theory. Nonlinear systems: existence and uniqueness, numerical methods, one and two dimensional flows, phase space, limit cycles, Poincare-Bendixson theorem, bifurcations, Hopf bifurcation, the Lorenz equations and chaos.

● **MATH 327 MATRIX NUMERICAL ANALYSIS.** (3) (Winter) (Prerequisites: MATH 223 or MATH 236. Corequisite: MATH 317)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

● ★ **MATH 328 COMPUTABILITY AND MATHEMATICAL LINGUISTICS.** (3) (Winter)

MATH 329 THEORY OF INTEREST. (3) (Winter) (Prerequisite: MATH 141) Simple and compound interest, annuities certain, amortization schedules, bonds, depreciation.

● **MATH 330 MATHEMATICAL FINANCE.** (3) (Prerequisites: MATH 222, MATH 323 or equivalent)

MATH 338 HISTORY AND PHILOSOPHY OF MATHEMATICS. (3) (Fall) Egyptian, Babylonian, Greek, Indian and Arab contributions to mathematics are studied together with some modern developments they give rise to, for example, the problem of trisecting the angle. European mathematics from the Renaissance to the 18th century is discussed in some detail.

● ★ **MATH 339 FOUNDATIONS OF MATHEMATICS.** (3) (Winter) (Prerequisites: MATH 235, MATH 318)

MATH 340 ABSTRACT ALGEBRA AND COMPUTING. (3) (Winter) (Prerequisites: MATH 240, MATH 223 (or MATH 236)) (For Major and Honours students in Computer Science only. Others only with the instructor's permission) Basic number theory: divisibility, Euclid's algorithm, congruences, Fermat's "little" theorem, primality testing, factorization. Commutative rings: basic definitions, (integers), gaussian integers, polynomial rings, euclidean rings, finite fields. Groups: symmetry groups, permutation groups. Additional topics.

MATH 343 DISCRETE MATHEMATICS AND APPLIED ALGEBRA. (3) (Winter) (Prerequisites: MATH 236, COMP 202) Basic combinatorics, introductory graph theory, matching, elementary group theory and symmetry, directed graphs and networks, modular arithmetic and its applications.

● ★ **MATH 346 NUMBER THEORY.** (3) (Winter) (Prerequisite: MATH 235 or consent of instructor)

MATH 348 TOPICS IN GEOMETRY. (3) (Fall and Summer) (Prerequisite: Previous course in Mathematics) Selected topics - the particular selection may vary from year to year. Topics include: isometries in the plane, symmetry groups of frieze and ornamental patterns, equidecomposibility, non-Euclidean geometry and problems in discrete geometry.

MATH 354 ANALYSIS 3. (3) (Fall) (Prerequisite: MATH 255 or equivalent) Introduction to metric spaces. Multivariable differential calculus, implicit and inverse function theorems.

MATH 355 ANALYSIS 4. (3) (Winter) (Prerequisite: MATH 255 or equivalent) Lebesgue measure on \mathbb{R}^n and integration, convergence theorems, Fubini's theorem. Further topics in metric spaces. Introduction to L_p spaces, Fourier series.

MATH 356 PROBABILITY. (3) (Fall) (Prerequisite: MATH 255 or MATH 243) (Not open to students who have taken or are taking MATH 323) Basic combinatorial probability. Introductory distribution theory of univariate and multivariate distributions with special reference to the Binomial, Poisson, Gamma and Normal distributions. Characteristic functions. Weak law of large numbers. Central limit theorem.

MATH 357 STATISTICS. (3) (Winter) (Prerequisite: MATH 356 or equivalent) (Not open to students who have taken or are taking MATH 324) Data analysis. Estimation and hypothesis testing. Power of tests. Likelihood ratio criterion. The chi-squared goodness of fit test. Introduction to regression analysis and analysis of variance.

MATH 363 DISCRETE MATHEMATICS. (3) (3-0-6) (Prerequisites: MATH 265 and either MATH 270 or consent of instructor) Logic and combinatorics. Mathematical reasoning and methods of proof. Sets, relations, functions, partially ordered sets, lattices, Boolean algebra. Propositional and predicate calculi. Recurrences and graph theory.

MATH 370 ALGEBRA 3. (3) (Fall) (Prerequisite: MATH 251) Introduction to monoids, groups, permutation groups; the isomorphism theorems for groups; the theorems of Cayley, Lagrange and Sylow; structure of groups of low order. Introduction to ring theory; integral

domains, fields, quotient field of an integral domain; polynomial rings; unique factorization domains.

MATH 371 ALGEBRA 4. (3) (Winter) (Prerequisite: MATH 370) Introduction to modules and algebras; finitely generated modules over a principal ideal domain. Field extensions; finite fields; Galois groups; the fundamental theorem of Galois theory; application to the classical problem of solvability by radicals.

MATH 375 DIFFERENTIAL EQUATIONS. (3) (Fall) (Prerequisites: MATH 247 or MATH 251 or equivalent, MATH 248 or equivalent, MATH 325) First order partial differential equations, geometric theory, classification of second order linear equations, Sturm-Liouville problems, orthogonal functions and Fourier series, eigenfunction expansions, separation of variables for heat, wave and Laplace equations, Green's function methods, uniqueness theorems.

★ **MATH 376 CHAOS AND NONLINEAR DYNAMICS.** (3) (Fall) (Prerequisites: MATH 222, MATH 223) (Intended primarily for Honours students. Not open to students who have taken or are taking MATH 326) This course consists of the lectures of MATH 326 together with a special project or projects assigned after consultation between the instructor and the student.

● ★ **MATH 377 NUMBER THEORY.** (3) (Winter) (Prerequisite: Enrolment in Mathematics Honours program or consent of instructor)

MATH 380 DIFFERENTIAL GEOMETRY. (3) (Winter) (Prerequisites: MATH 251 or MATH 247, and MATH 248 or MATH 314) In addition to the topics of MATH 320, topics in the global theory of plane and space curves, and in the global theory of surfaces are presented. These include: total curvature and the Fary-Milnor theorem on knotted curves, abstract surfaces as 2-d manifolds, the Euler characteristic, the Gauss-Bonnet theorem for surfaces.

MATH 381 COMPLEX VARIABLES AND TRANSFORMS. (3) (3-1-5) (Prerequisite: MATH 265) Analytic functions, Cauchy-Riemann equations, simple mappings, Cauchy's theorem, Cauchy's integral formula, Taylor and Laurent expansions, residue calculus. Properties of one and two-sided Fourier and Laplace transforms, the complex inversion integral, relation between the Fourier and Laplace transforms, application of transform techniques to the solution of differential equations. The Z-transform and applications to difference equations.

● ★ **MATH 387 NUMERICAL ANALYSIS.** (3) (Fall) (Prerequisites: MATH 222 and COMP 202 or COMP 250 or equivalent, or consent of instructor) (Intended primarily for Honours students)

● **MATH 397 MATRIX NUMERICAL ANALYSIS.** (3) (Prerequisites: MATH 251, MATH 387 or consent of instructor)

● ★ **MATH 407 DYNAMIC PROGRAMMING.** (3) (Winter) (Prerequisites: COMP 202; MATH 223 or MATH 236, MATH 314, MATH 315 and MATH 323) Sequential decision problems, resource allocation, transportation problems, equipment replacement, integer programming, network analysis, inventory systems, project scheduling, queuing theory calculus of variations, markovian decision processes, stochastic path problems, reliability, discrete and continuous control processes.

MATH 417 MATHEMATICAL PROGRAMMING. (3) (Fall) (Prerequisites: COMP 202, and MATH 223 or MATH 236, and MATH 314 or equivalent) An introductory course in optimization by linear algebra, and calculus methods. Linear programming (convex polyhedra, simplex method, duality, multi-criteria problems), integer programming, and some topics in nonlinear programming (convex functions, optimality conditions, numerical methods). Representative applications to various disciplines.

MATH 420 INDEPENDENT STUDY IN MATHEMATICS. (3) (Fall and Winter and Summer) (Requires Departmental Approval) (Please see regulations concerning Project Courses under Faculty Degree Requirements) Reading projects permitting independent study under the guidance of a staff member specializing in a subject where no appropriate course is available. Arrangements must be made with an instructor and the Chair before registration.

MATH 423 REGRESSION AND ANALYSIS OF VARIANCE. (3) (Fall) (Prerequisites: MATH 324, and MATH 223 or MATH 236) Least-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

squares estimators and their properties. Analysis of variance. Linear models with general covariance. Multivariate normal and chi-squared distributions; quadratic forms. General linear hypothesis: F-test and t-test. Prediction and confidence intervals. Transformations and residual plot. Balanced designs.

★ **MATH 437 MATHEMATICAL METHODS IN BIOLOGY.** (3) (Fall) (Prerequisites: MATH 315 or MATH 325, and MATH 323 or MATH 356, a CEGEP or higher level computer programming course) The formulation and treatment of realistic mathematical models describing biological phenomena through such qualitative and quantitative mathematical techniques as local and global stability theory, bifurcation analysis and phase plane analysis. Numerical simulation. Concrete and detailed examples will be drawn from molecular, cellular and population biology and mammalian physiology.

★ **MATH 447 STOCHASTIC PROCESSES.** (3) (Winter) (Prerequisite: MATH 323) Random walk on the integers and gambler's ruin problem; the Galton-Watson branching process; Markov chains and their applications in the physical and social sciences; birth and death processes and their applications to biological growth problems and queueing systems.

MATH 466 COMPLEX ANALYSIS. (3) (Fall) (Prerequisite: MATH 354) Functions of a complex variable, Cauchy-Riemann equations, Cauchy's theorem and its consequences. Uniform convergence on compacta. Taylor and Laurent series, open mapping theorem, Rouché's theorem and the argument principle. Calculus of residues. Fractional linear transformations.

MATH 470 HONOURS PROJECT. (3) (Fall and Winter and Summer) (Requires Departmental Approval) (Prerequisites: appropriate second year honours courses with approval of coordinator) (Please see regulations concerning Project Courses under Faculty Degree Requirements) The student will be assigned a project supervisor and a project topic at the beginning of the semester. The project will consist of a written report including a literature survey and will be tested by an oral examination.

May also be available as: **MATH 470D1 and MATH 470D2**

MATH 480 INDEPENDENT STUDY IN MATHEMATICS. (3) (Fall and Winter and Summer) (Please see regulations concerning Project Courses under Faculty Degree Requirements) (Requires Departmental Approval) Reading projects permitting independent study under the guidance of a staff member specializing in a subject where no appropriate course is available. Arrangements must be made with an instructor and the Chair before registration.

MATH 487 MATHEMATICAL PROGRAMMING. (3) (Fall) (Prerequisites: MATH 248, MATH 251 and COMP 202 or MATH 250 or equivalent) Intended primarily for honours students. This course consists of the lectures of MATH 417 together with a special project or projects assigned after consultation between the instructor and the student.

★ **MATH 488 SET THEORY.** (3) (Fall) (Prerequisites: MATH 251 or MATH 255 or permission of instructor) Axioms of set theory. Operations on sets. Ordinal and cardinal numbers. Well-orderings, transfinite induction and recursion. Consequences of the axiom of choice. Boolean algebras. Cardinal arithmetic. Topics include: Linear orderings, trees. Infinite combinatorics, partition calculus. Set-theoretic aspects of point-set topology. Descriptive set-theory. Stationary sets. Set-theoretic principles going beyond the basic axiom system.

MATH 523 GENERALIZED LINEAR MODELS. (4) (Winter) (Prerequisite: MATH 423 or EPIB 697) (Not open to students who have taken MATH 426) Modern discrete data analysis. Exponential families, orthogonality, link functions. Inference and model selection using analysis of deviance. Shrinkage (Bayesian, frequentist viewpoints). Smoothing. Residuals. Quasi-likelihood. Sliced inverse regression. Contingency tables: logistic regression, log-linear models. Censored data. Applications to current problems in medicine, biological and physical sciences. GLIM, S, software.

MATH 524 NONPARAMETRIC STATISTICS. (4) (Fall) (Prerequisite: MATH 324 or equivalent) (Not open to students who have taken MATH 424) Distribution free procedures for 2-sample problem: Wil-

coxon rank sum, Siegel-Tukey, Smirnov tests. Shift model: power and estimation. Single sample procedures: Sign, Wilcoxon signed rank tests. Nonparametric ANOVA: Kruskal-Wallis, Friedman tests. Association: Spearman's rank correlation, Kendall's tau. Goodness of fit: Pearson's chi-square, likelihood ratio, Kolmogorov-Smirnov tests. Statistical software packages used.

MATH 525 SAMPLING THEORY AND APPLICATIONS. (4) (Winter) (Prerequisite: MATH 324 or equivalent) (Not open to students who have taken MATH 425) Simple random sampling, domains, ratio and regression estimators, superpopulation models, stratified sampling, optimal stratification, cluster sampling, sampling with unequal probabilities, multistage sampling, complex surveys, nonresponse.

● **MATH 555 FLUID DYNAMICS.** (4) (Fall) (Prerequisites: MATH 315 and MATH 319 or equivalent) Kinematics.

MATH 556 MATHEMATICAL STATISTICS 1. (4) (Fall) (Prerequisite: MATH 357 or equivalent) Probability and distribution theory (univariate and multivariate). Exponential families. Laws of large numbers and central limit theorem.

MATH 557 MATHEMATICAL STATISTICS 2. (4) (Winter) (Prerequisite: MATH 556) Sampling theory (including large-sample theory). Likelihood functions and information matrices. Hypothesis testing, estimation theory. Regression and correlation theory.

MATH 560 OPTIMIZATION. (4) (Winter) (Prerequisite: Undergraduate background in analysis and linear algebra, with instructor's approval) Classical optimization in n variables. Convex sets and functions, optimality conditions for single-objective and multi-objective nonlinear optimization problems with and without constraints. Duality theories and their economic interpretations. Optimization with functionals. Connections with calculus of variations and optimal control. Stability of mathematical models. Selected numerical methods.

● **MATH 561 ANALYTICAL MECHANICS.** (4) (Prerequisites: MATH 354 and MATH 380 or instructor's approval)

MATH 564 ADVANCED REAL ANALYSIS 1. (4) (Fall) (Prerequisites: MATH 354, MATH 355 or equivalents) Review of theory of measure and integration; product measures, Fubini's theorem; L_p spaces; basic principles of Banach spaces; Riesz representation theorem for $C(X)$; Hilbert spaces; part of the material of MATH 565 may be covered as well.

MATH 565 ADVANCED REAL ANALYSIS 2. (4) (Winter) (Prerequisite: MATH 564) Continuation of topics from MATH 564. Signed measures, Hahn and Jordan decompositions. Radon-Nikodym theorems, complex measures, differentiation in \mathbb{R}^n , Fourier series and integrals, additional topics.

● **MATH 566 ADVANCED COMPLEX ANALYSIS.** (4) (Winter) (Prerequisites: MATH 466, MATH 564)

MATH 570 HIGHER ALGEBRA 1. (4) (Fall) (Prerequisite: MATH 371 or equivalent) Review of group theory; free groups and free products of groups. Sylow theorems. The category of R -modules; chain conditions, tensor products, flat, projective and injective modules. Basic commutative algebra; prime ideals and localization, Hilbert Nullstellensatz, integral extensions. Dedekind domains. Part of the material of MATH 571 may be covered as well.

MATH 571 HIGHER ALGEBRA 2. (4) (Winter) (Prerequisites: MATH 570 or consent of instructor) Completion of the topics of MATH 570. Rudiments of algebraic number theory. A deeper study of field extensions; Galois theory, separable and regular extensions. Semi-simple rings and modules. Representations of finite groups.

● **MATH 574 ORDINARY DIFFERENTIAL EQUATIONS.** (4) (Prerequisites: MATH 325, MATH 354)

● **MATH 575 PARTIAL DIFFERENTIAL EQUATIONS.** (4) (Prerequisite: MATH 375) A continuation of topics introduced in MATH 375.

MATH 576 GEOMETRY AND TOPOLOGY 1. (4) (Fall) (Prerequisite: MATH 354) Basic point-set topology, including connectedness, compactness, product spaces, separation axioms, metric spaces. The fundamental group and covering spaces. Simplicial complexes. Singular and simplicial homology. Part of the material of MATH 577 may be covered as well.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

MATH 577 GEOMETRY AND TOPOLOGY 2. (4) (Winter) (Prerequisite: MATH 576) Continuation of the topics of MATH 576. Manifolds and differential forms. De Rham's theorem. Riemannian geometry. Connections and curvatures 2-Manifolds and imbedded surfaces.

MATH 578 NUMERICAL ANALYSIS 1. (4) (Fall) (Prerequisites: MATH 223 or MATH 247 or MATH 251 or MATH 270; MATH 248 or MATH 265 or MATH 314; MATH 315 or MATH 261 or MATH 325; MATH 317 or MATH 387; or the instructor's approval.) Development, analysis and effective use of numerical methods to solve problems arising in applications. Topics include linear and nonlinear systems of equations, fast Fourier transform, eigenvalue problems, interpolation, approximation, quadrature, solution of ordinary differential equations.

MATH 579 NUMERICAL DIFFERENTIAL EQUATIONS. (4) (Winter) (Prerequisites: MATH 266 or MATH 375, MATH 317, MATH 319, MATH 387 or MATH 578; or the instructor's approval.) Numerical solution of initial and boundary value problems in science and engineering: ordinary differential equations; partial differential equations of elliptic, parabolic and hyperbolic type. Topics include Runge Kutta and linear multistep methods, adaptivity, finite elements, finite differences, finite volumes, spectral methods, preconditioning and fast solvers.

● **MATH 585 INTEGRAL EQUATIONS AND TRANSFORMS.** (4) (Winter)

MATH 586 APPLIED PARTIAL DIFFERENTIAL EQUATIONS. (4) (Fall or Winter) (Prerequisites MATH 316, MATH 375 or equivalent) Linear and nonlinear partial differential equations of applied mathematics. Classification and appropriate partial initial and/or boundary conditions for elliptic, hyperbolic and parabolic equations. Method of characteristics for first-order systems and quasi linear equations. Transform methods. Introduction to generalized functions. Special techniques for finding exact solutions of nonlinear equations.

MATH 587 ADVANCED PROBABILITY THEORY 1. (4) (Fall) (Prerequisite: MATH 356 or equivalent and approval of instructor) Probability spaces. Random variables and their expectations. Convergence of random variables in L_p . Independence and conditional expectation. Introduction to Martingales. Limit theorems including Kolmogorov's Strong Law of Large Numbers.

MATH 589 ADVANCED PROBABILITY THEORY 2. (4) (Winter) (Prerequisites: MATH 587 or equivalent) Characteristic functions: elementary properties, inversion formula, uniqueness, convolution and continuity theorems. Weak convergence. Central limit theorem. Additional topic(s) chosen (at discretion of instructor) from: Martingale Theory; Brownian motion, stochastic calculus.

● **MATH 591 MATHEMATICAL LOGIC 1.** (4) (Winter) (Prerequisites: MATH 488 or equivalent or consent of instructor)

MATH 592 MATHEMATICAL LOGIC 2. (4) (Winter) (Prerequisites: MATH 488 or equivalent or consent of instructor) Introduction to recursion theory; recursively enumerable sets, relative recursiveness. Incompleteness, undecidability and undefinability theorems of Gödel, Church, Rosser and Tarski. Some of the following topics: Turing degrees, Friedberg-Muchnik theorem, decidable and undecidable theories.

MIMM – Microbiology and Immunology (Sci)

Offered by: Department of Microbiology and Immunology
Former Teaching Unit Code: 528

MIMM 211 INTRODUCTORY MICROBIOLOGY. (3) (Fall) (3 hours of lecture) (Corequisite: BIOL 200) A general treatment of microbiology bearing specifically on the biological properties of microorganisms. Emphasis will be on prokaryotic cells. Basic principles of immunology and microbial genetics are also introduced.

MIMM 212 LABORATORY IN MICROBIOLOGY. (2) (Fall) (3 hours of laboratory, 1 hour of conference) (Corequisite: MIMM 211) This laboratory course is designed to complement MIMM 211. Sessions introduce general techniques peculiar to the handling of microorganisms.

MIMM 314 IMMUNOLOGY. (3) (Winter) (3 hours of lecture) (Prerequisite: BIOL 200 and BIOL 201 or BIOC 212) An introduction to the immune system, antigens, antibodies and lymphocytes. The course will cover the cellular and molecular basis of lymphocyte development and mechanisms of lymphocyte activation in immune responses.

MIMM 323 MICROBIAL PHYSIOLOGY. (3) (Fall) (3 hours of lecture) (Prerequisite: MIMM 211) An introduction to the composition and structure of microbial cells, the biochemical activities associated with cellular metabolism and how these activities are regulated and coordinated. The course will have a molecular and genetic approach to the study of microbial physiology.

MIMM 324 FUNDAMENTAL VIROLOGY. (3) (Fall) (3 hours of lecture) (Prerequisites: MIMM 211, BIOL 200, BIOL 201 or BIOC 212) A study of the fundamental properties of viruses and their interactions with host cells. Bacteriophages, DNA- and RNA-containing animal viruses, and retroviruses are covered. Emphasis will be on phenomena occurring at the molecular level and on the regulated control of gene expression in virus-infected cells.

MIMM 386D1 LABORATORY IN MICROBIOLOGY AND IMMUNOLOGY. (3) (Fall) (1 hour lecture, 6 hours laboratory, 1 hour follow-up) (Prerequisites: MIMM 211, MIMM 212. Corequisites: MIMM 314, MIMM 323, MIMM 324) (Students must also register for MIMM 386D2) (No credit will be given for this course unless both MIMM 386D1 and MIMM 386D2 are successfully completed in consecutive terms) A series of illustrative exercises in bacterial classification, bacterial and viral molecular genetics and immunological techniques. The objective is to provide a practical introduction to microbiological and immunological research and technology.

MIMM 386D2 LABORATORY IN MICROBIOLOGY AND IMMUNOLOGY. (3) (Winter) (Prerequisite: MIMM 386D1) (No credit will be given for this course unless both MIMM 386D1 and MIMM 386D2 are successfully completed in consecutive terms) See MIMM 386D1 for course description.

MIMM 387 APPLIED MICROBIOLOGY AND IMMUNOLOGY. (3) (Winter) (Prerequisite: MIMM 211) The ability to select and manipulate genetic material has led to unprecedented interest in the industrial applications of prokaryotic and eucaryotic cells. Beginning in the 1970s the introduction of and subsequent refinements to recombinant DNA technology and hybridoma technology transformed the horizons of the biopharmaceutical world. This course will highlight the important events that link basic research to clinical/commercial application of new drugs and chemicals.

MIMM 413 PARASITOLOGY. (3) (Winter) (Prerequisite: MIMM 314 or equivalent - ANAT 261 is strongly recommended) A study of the biology, immunological aspects of host-parasite interactions, pathogenicity, epidemiology and molecular biological aspects of selected parasites of medical importance. Laboratory will consist of a lecture on techniques, demonstrations and practical work.

MIMM 414 ADVANCED IMMUNOLOGY. (3) (Fall) (3 hour lecture) (Prerequisite: MIMM 314) An advanced course serving as a logical extension of MIMM 314. The course will integrate molecular, cellular and biochemical events involved in the ontogeny of the lymphoid system and its activation in the immune response. The course will provide the student with an up-to-date understanding of a rapidly moving field.

MIMM 465 BACTERIAL PATHOGENESIS. (3) (Fall) (3 hours of lecture) (Prerequisites: MIMM 211, MIMM 314, MIMM 323, or the permission of the instructor) Organized by the McGill Centre for the Study of Host Resistance. This course focuses on the interplay of the host and the pathogen. The cellular and molecular basis of the host defense mechanism against infections will be considered in relationship to the virulence factors and evasion strategies used by bacteria to cause disease.

MIMM 466 VIRAL PATHOGENESIS. (3) (Winter) (3 hours of lecture) (Prerequisites: MIMM 211, MIMM 324, MIMM 314) A study of the biological and molecular aspects of viral pathogenesis with emphasis on the human pathogenic viruses including the retroviruses HIV and HTLV-1; herpes viruses; papilloma viruses; hepatitis viruses;

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

and new emerging human viral diseases. These viruses will be discussed in terms of virus multiplication, gene expression virus-induced cytopathic effects and host immune response to infection.

MIMM 502D1 HONOURS RESEARCH PROJECT. (6) (Fall) (More than 15 hours per week for an independent research project) (U3 Honours students and Majors students are eligible. Required CGPA: 3.30 or higher) (Please see regulations concerning Project Courses) (Students must also register for MIMM 502D2) (No credit will be given for this course unless both MIMM 502D1 and MIMM 502D2 are successfully completed in consecutive terms) An information meeting about the course is held annually in February for students who intend to apply for registration. Subject to the availability of space and resources, professors in the Department of Microbiology and Immunology provide research opportunities for registrants in this course. Students present their research findings in a seminar and a final written report is required. Because this is a 12 credit course, students are expected to devote at least 40% of their academic effort towards their research.

MIMM 502D2 HONOURS RESEARCH PROJECT. (6) (Winter) (Prerequisite: MIMM 502D1) (No credit will be given for this course unless both MIMM 502D1 and MIMM 502D2 are successfully completed in consecutive terms) See MIMM 502D1 for course description.

MIMM 509 INFLAMMATORY PROCESSES. (3) (Winter) (3 hours of seminar) (Prerequisite: MIMM 314. Corequisite: PHGY 513 or MIMM 414) (This course will be given in conjunction with the Division of Experimental Medicine) This course concentrates on the non-specific aspects of the immune response, an area which is not adequately covered by the other immunology courses presented at the university. Interactions between guest researchers (from McGill and other universities) and students will be furthered.

NEUR – Neurology and Neurosurgery

Offered by: Department of Neurology and Neurosurgery
Former Teaching Unit Code: 531

NEUR 310 CELLULAR NEUROBIOLOGY. (3) (Winter) (2 lectures each week) (Prerequisite or corequisite: BIOL 200 and BIOL 201, or PHGY 209, or PHGY 210) A survey of the functional organization of nerve cells, signalling in the nervous system, and principles of neural development. Topics include cell polarity, neurotransmitters, neurotrophins, receptors and second messengers, cell lineage, guidance of axon outgrowth, and nerve regeneration. Emphasis will be placed on analysis of neurons at the molecular level.

PATH – Pathology

Offered by: Department of Pathology
Former Teaching Unit Code: 546

PATH 300 HUMAN DISEASE. (3) (Winter) (Prerequisites: BIOL 200, BIOL 201 or BIOC 212, PHGY 209. Pre-/co-requisite: PHGY 210) Provides a fundamental understanding of the diseases prevalent in North America, for upper level students in the biological sciences. Includes: general responses of cells and organ systems to injury; assessment of individual diseases by relating the causes, symptoms, diagnosis, treatment and prevention to the primary biological abnormalities in each disorder.

PHAR – Pharmacology and Therapeutics

Offered by: Department of Pharmacology and Therapeutics
Former Teaching Unit Code: 549

PHAR 300 DRUG ACTION. (3) (Fall) (Prerequisites: BIOL 200 and BIOL 201 or BIOC 212, PHGY 209 and PHGY 210 or permission of instructor) This course covers the fundamental principles of pharmacology and toxicology. Frequently encountered drugs are used as a focus to illustrate sites and mechanisms of action, distribution, metabolism, elimination and adverse effects.

PHAR 301 DRUGS AND DISEASE. (3) (Winter) (Prerequisites: BIOL 200, BIOL 201 or BIOC 212, PHGY 209 and PHGY 210 and PHAR 300 or permission of instructor) This course further explores the basic principles of pharmacology as illustrated by drugs used in the treatment of disease. Emphasis is placed on drugs used for diseases prevalent in North America.

PHAR 303 PRINCIPLES OF TOXICOLOGY. (3) (Winter) (Prerequisites: BIOL 200, BIOL 201 or BIOC 212, PHGY 209 and PHGY 210) Fundamental mechanisms by which toxic compounds damage a biological system (organelle, cell, organ, organism, ecosystem). Detection and quantification of toxicity and risk/benefit analysis are considered. Selected agents of current risk to human health or the environment are evaluated in depth.

PHAR 503 DRUG DESIGN AND DEVELOPMENT 1. (3) (Fall) (Prerequisites: CHEM 302, BIOL 200, BIOL 201, BIOC 212, PHAR 300, PHAR 301, PHAR 303 or permission of coordinator) (Not open to students who are taking or have taken CHEM 503) (Priority: students registered in the Minor in Pharmacology) Interdisciplinary course in drug design and development covering chemistry, mechanisms of drug action and steps in drug development, principles and problems in drug design.

PHAR 504 DRUG DESIGN AND DEVELOPMENT 2. (3) (Winter) (Prerequisite: PHAR 503/CHEM 503) (U3 and graduate students. Students can register only with permission of coordinators) (Not open to students who are taking or have taken CHEM 504) Interdisciplinary course in drug design and development in which teams of 2-4 students select a lead chemical compound, design the analogues, propose the preclinical and clinical studies, present possible untoward effects, and reasons for drug (dis)approval.

PHAR 562 GENERAL PHARMACOLOGY 1. (3) (Fall) (Prerequisites: PHGY 209 and PHGY 210, BIOL 200 and BIOL 201 or BIOC 311 and BIOC 312 or equivalent) (Restrictions: Open to U3 students with permission of instructors, and students registered in the Minor Pharmacology Program) Principles of pharmacology as illustrated by current issues with an emphasis on the nervous system will be discussed. Drugs classified by their molecular target of action, their mechanism of action, and possibly a rationale for therapeutic use will be presented. Students will be required to examine and interpret scientific data, to write a paper and/or participate in small group discussions.

PHAR 563 GENERAL PHARMACOLOGY 2. (3) (Winter) (Prerequisites: PHGY 209 and PHGY 210, BIOL 200 and BIOL 201 or BIOC 311 and BIOC 312 or equivalent) (Restrictions: Open to U3 students with permission of instructors, and students registered in the Minor in Pharmacology Program) Selected topics of basic interactions between chemicals and biological systems. Actions of drugs at the molecular and cellular levels. Principles of drug development. Chemotherapy of infections and of cancer. Toxicology and pharmacokinetics/dynamics. Drug metabolism.

PHAR 599 RESEARCH PROJECTS IN PHARMACOLOGY. (6) (Minimum of 12 hours per week to be spent in the lab and/or library.) (Pre-/co-requisite PHAR 562 and PHAR 563 or PHAR 300 and PHAR 301) (Restrictions: Open to U3 students with permission of instructors, and students registered in the Minor Pharmacology Program. Students should consult instructors 3 - 4 weeks before registration. Students may not register without prior approval of the course coordinator(s)) (Please see regulations concerning Project Courses) This course involves individual research work. Students select a project under the supervision of a staff member. Areas of interest include toxicology, endocrine, developmental, cardiovascular, reproductive and neuropharmacology. This course requires a minimum of 6 hours per week for the full year course (PHAR 599 D1/PHAR 599D2), and a minimum of 12 hours per week for the half year (PHAR 599) course to be spent in the laboratory and/or library.

Also offered as:

PHAR 599D1 RESEARCH PROJECTS IN PHARMACOLOGY. (3) (Fall)

PHAR 599D2 RESEARCH PROJECTS IN PHARMACOLOGY. (3) (Winter)

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

PHGY – Physiology

Offered by: Department of Physiology
Former Teaching Unit Code: 552

● **PHGY 100 THE BODY MATTERS.** (3) (Fall) (3-hour seminar per week) (Not open to students who have taken or are taking PHGY 201, PHGY 202, PHGY 209, PHGY 210, or PHGY 211)

● **PHGY 198 FYS: RHYTHMS AND FEEDBACK IN BIOMEDICINE.** (3) (Fall) (3 hours seminar) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 25) (Corequisite: MATH 140)

PHGY 199 FYS: HISTORY OF GENETIC ENGINEERING. (3) (Winter) (3 hours seminar per week) (Open only to newly admitted students in U0 or U1, who may take only one FYS. Students who register for more than one will be obliged to withdraw from all but one of them.) (Maximum 20) The history of molecular biology and genetic engineering will be surveyed through a series of essays and reviews written by historic figures and prominent scientists of today. The course will trace key players and principal advances in our understanding of the gene, its manipulation, and the future of genetic engineering.

PHGY 201 HUMAN PHYSIOLOGY: CONTROL SYSTEMS. (3) (Fall) (3 hours lecture weekly) (Prerequisites: collegial courses in biology or anatomy, and in chemistry and physics; with CHEM 212 or equivalent, as a pre-/co-requisite) (For students in Physical and Occupational Therapy, Nursing, and others with permission of the course coordinator) (Not open to students who have taken PHGY 209) Physiology of body fluids, blood, nerve and muscle, peripheral nerves, central nervous system, special senses, autonomic nervous system, defense mechanisms.

PHGY 202 HUMAN PHYSIOLOGY: BODY FUNCTIONS. (3) (Winter) (3 hours lecture weekly) (Prerequisites: collegial courses in biology or anatomy and in chemistry and physics; with CHEM 212 or equivalent, as a pre-/co-requisite) (For students in Physical and Occupational Therapy, Nursing, Education, and others with permission of the course coordinator) (Not open to students who took 552-201 in 1976-77 or earlier, or PHGY 210) Physiology of the cardiovascular, respiratory, excretory, endocrine, and digestive systems; organic and energy metabolism; nutrition; exercise and environmental stress.

PHGY 209 MAMMALIAN PHYSIOLOGY 1. (3) (Fall) (3 hours lectures weekly) (Prerequisites: as for PHGY 201 and PHGY 202. Pre-/co-requisites: BIOL 200, BIOL 201 or BIOC 212) (Not open to students who have taken PHGY 211 or PHGY 201) (For students in the Faculty of Science, and other students by permission of the instructor) The course covers the physiology of body fluids, blood, body defense mechanisms, peripheral and central nervous system, muscle. Students must be prepared to attend evening (19:00 - 20:00) class tests.

PHGY 210 MAMMALIAN PHYSIOLOGY 2. (3) (Winter) (3 hours lectures weekly) (Prerequisites: as for PHGY 201 and PHGY 202. Pre-/co-requisite: BIOL 200, BIOL 201 or BIOC 212) (Not open to students who have taken PHGY 211 or PHGY 202) (For students in the Faculty of Science, and other students by permission of the instructor) (Although PHGY 210 may be taken without the prior passing of PHGY 209, students should note that they may have some initial difficulties because of lack of familiarity with some basic concepts introduced in PHGY 209) Physiology of the autonomic nervous system; cardiovascular, respiratory, digestive and renal systems; exercise physiology.

PHGY 212D1 INTRODUCTORY PHYSIOLOGY LABORATORY. (1) (Fall) (One 3-hour lab and one 1-hour lecture every second week) (Corequisites: PHGY 209 and PHGY 210) (Required for Physiology students enrolled in PHGY 209 and PHGY 210. Open to Honours and Major students from some other departments) (For students in a Physiology program, PHGY 212 should be taken concurrently with PHGY 209 and PHGY 210) (Students must also register for PHGY 212D2) (No credit will be given for this course unless both

PHGY 212D1 and PHGY 212D2 are successfully completed in consecutive terms) Exercises illustrating fundamental principles in physiology: blood, neurophysiology, smooth muscle; cardiovascular, respiratory, endocrine, exercise and renal physiology.

PHGY 212D2 INTRODUCTORY PHYSIOLOGY LABORATORY. (1) (Winter) (Prerequisite: PHGY 212D1) (No credit will be given for this course unless both PHGY 212D1 and PHGY 212D2 are successfully completed in consecutive terms) See PHGY 212D1 for course description.

PHGY 311 INTERMEDIATE PHYSIOLOGY 1. (3) (Fall) (3 hours of lectures per week; 1-3 hours optional lab/demonstration/tutorial arranged for a maximum of 3 afternoons per term) (Prerequisites: PHGY 209 and PHGY 210 or equivalent, or permission of the instructor) In-depth presentation of experimental results and hypotheses on cellular communication in the nervous system and the endocrine system.

PHGY 312 INTERMEDIATE PHYSIOLOGY 2. (3) (Winter) (3 hours of lectures per week; 1-3 hours optional lab/demonstration/tutorial arranged for a maximum of 3 Wednesday afternoons per term) (Prerequisites: PHGY 209 and PHGY 210 or equivalent, PHGY 311 or permission of the instructor) In-depth presentation of experimental results and hypotheses underlying our current understanding of topics in immunology, kidney function and respiration explored beyond the introductory level.

PHGY 313 INTERMEDIATE PHYSIOLOGY 3. (3) (Winter) (3 hours of lectures per week; 1-3 hours optional lab/demonstration/tutorial arranged for a maximum of 3 Wednesday afternoons per term) (Prerequisites: PHGY 209 and PHGY 210 or equivalent, PHGY 311 or permission of the instructor) In-depth presentation of experimental results and hypotheses underlying our current understanding of the physiology of the cardiovascular system; blood physiology including hemostasis and thrombosis; transport of fluids and cells; general cell kinetics and regulation, and gastrointestinal physiology.

PHGY 314 INTEGRATIVE NEUROSCIENCE. (3) (Fall) (3 hours of lectures per week) (Prerequisites: PHGY 209 and PHGY 210) In depth presentation of experimental results and hypotheses underlying our current understanding of how single neurons and ensembles of neurons encode sensory information, generate movement, and control cognitive functions such as emotion, learning, and memory, during voluntary behaviours.

PHGY 351 RESEARCH TECHNIQUES: PHYSIOLOGY. (3) (Winter) (2 hour lecture and 3 hour lab weekly) (Prerequisites: PHGY 209, PHGY 210 and PHGY 311. Corequisites: PHGY 312 and PHGY 313) (Restricted to Honours Physiology students) Provides an overview of common research methods in Physiology, including critical analysis and practical experience with some of the methods. Topics include research ethics of animal experimentation, data analysis, membrane biophysics, radioimmunoassay, ion sensitive dyes, immunocytochemistry, localization techniques, protein transport, cell sorting and molecular biology.

PHGY 359D1 TUTORIAL IN PHYSIOLOGY. (0.5) (Fall) (Prerequisites: PHGY 209 and PHGY 210 or equivalent. Corequisites: PHGY 311, PHGY 312 and PHGY 313. Enrolment restricted to Honours Physiology students) (Students must also register for PHGY 359D2) (No credit will be given for this course unless both PHGY 359D1 and PHGY 359D2 are successfully completed in consecutive terms) The course consists of regularly scheduled meetings between each individual student and a chosen staff member, to consider current problems in biomedical research and to develop background for a research project to be carried out in U3. Brief written summaries of each meeting are required.

PHGY 359D2 TUTORIAL IN PHYSIOLOGY. (0.5) (Winter) (Prerequisite: PHGY 359D1) (No credit will be given for this course unless both PHGY 359D1 and PHGY 359D2 are successfully completed in consecutive terms) See PHGY 359D1 for course description.

PHGY 419D1 PROJECT AND SEMINAR IN IMMUNOLOGY. (4.5) (Fall) (15-18 hours lab, 1 hour seminar weekly) (Enrolment restricted to U3 Honours Immunology students) (Please see regulations con-

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

cerning Project Courses) (Students must also register for PHGY 419D2) (No credit will be given for this course unless both PHGY 419D1 and PHGY 419D2 are successfully completed in consecutive terms) Individual research projects in immunology under the guidance of staff members in the three participating departments: Physiology, Biochemistry, and Microbiology and Immunology.

PHGY 419D2 PROJECT AND SEMINAR IN IMMUNOLOGY. (4.5) (Winter) (Prerequisite: PHGY 419D1) (No credit will be given for this course unless both PHGY 419D1 and PHGY 419D2 are successfully completed in consecutive terms) See PHGY 419D1 for course description.

● **PHGY 423 PHYSIOLOGICAL DYNAMICS.** (3) (Fall) (Prerequisites: PHGY 209 and PHGY 210 or equivalent, and BIOL 309 or MATH 315, or permission of the instructor) T

● ★ **PHGY 444 THEORETICAL ELECTROPHYSIOLOGY.** (3) (Fall) (3 hours lecture/seminar per week) (Prerequisites: PHGY 209 and PHGY 210 or equivalent; BIOL 309 or MATH 315) (Offered in even numbered years)

PHGY 451 ADVANCED NEUROPHYSIOLOGY. (3) (Fall) (3 hours lecture) (Prerequisites: PHGY 311 or equivalent and BIOL 301) (Departmental approval required) Topics of current interest in neurophysiology including the development of neurons and synapses, physiology of ionic channels, presynaptic and postsynaptic events in synaptic transmission and neuronal interactions in CNS function.

PHGY 459D1 PHYSIOLOGY SEMINAR. (3) (Fall) (2 hours seminar) (Prerequisite: permission of instructors) (Required course for U3 Honours students.) (Students must also register for PHGY 459D2) (No credit will be given for this course unless both PHGY 459D1 and PHGY 459D2 are successfully completed in consecutive terms) Discussion of topics in mammalian, cellular and molecular physiology. Students will be required to write one essay and make at least one oral presentation per term. A final course essay is required.

PHGY 459D2 PHYSIOLOGY SEMINAR. (3) (Winter) (Prerequisite: PHGY 459D1) (No credit will be given for this course unless both PHGY 459D1 and PHGY 459D2 are successfully completed in consecutive terms) See PHGY 459D1 for course description.

PHGY 461D1 EXPERIMENTAL PHYSIOLOGY. (4.5) (Fall) (Permission of the instructor required.) (This course is a requirement for U3 students in the Honours Physiology program, the Major Program in Physiology and Mathematics, and the Major program in Physiology and Physics, and is open to a limited number of other U3 Physiology students) (Please see regulations concerning Project Courses) (Students must also register for PHGY 461D2) (No credit will be given for this course unless both PHGY 461D1 and PHGY 461D2 are successfully completed in consecutive terms) Individual project work under the supervision of Departmental Staff members.

PHGY 461D2 EXPERIMENTAL PHYSIOLOGY. (4.5) (Winter) (Prerequisite: PHGY 461D1) (No credit will be given for this course unless both PHGY 461D1 and PHGY 461D2 are successfully completed in consecutive terms) See PHGY 461D1 for course description.

PHGY 502 EXERCISE PHYSIOLOGY. (3) (Winter) (Prerequisites: PHGY 311, PHGY 312, and PHGY 313) Behaviour of physiological processes in response to physical effort, in areas such as structural basis of muscle contraction, thermoregulation during exercise, mechanics and energetics of muscle contraction, fuel utilization, fatigue, physiological adjustments during exercise and influence of training.

PHGY 508 ADVANCED RENAL PHYSIOLOGY. (3) (Fall) (Prerequisite: PHGY 312 or the equivalent) (Open to advanced undergraduate and graduate students) Offered in conjunction with the Department of Medicine. Lectures and seminars will cover advanced concepts in selected areas of kidney physiology (glomerular and tubular function) as well as membrane and epithelial transport. Students will be expected to critically discuss selected experimental papers.

PHGY 513 CELLULAR IMMUNOLOGY. (3) (Winter) (3 hours lectures plus term paper) (Prerequisite: MIMM 314, or permission of the instructor) This course deals with cellular interactions, regulation and effector mechanisms of the normal immune response in rela-

tion to diseases and pathogenic processes. It is taught at an advanced level.

● **PHGY 515 PHYSIOLOGY OF BLOOD 1.** (3) (Fall) (2 hours lecture plus 1 hour seminar weekly) (Prerequisite: PHGY 313 or PHGY 312 or permission of the instructor)

PHGY 516 PHYSIOLOGY OF BLOOD 2. (3) (Winter) (2 hours lecture plus 1 hour seminar weekly) Bone marrow hematopoiesis, with emphasis on regulation of stem cell proliferation and differentiation along hematopoietic pathways. Formation and differentiation of red and white blood cells and some of the diseases associated with hemopoiesis will be covered. Emphasis will be given to the molecular mechanisms involved in the normal and pathological conditions.

● **PHGY 517 ARTIFICIAL INTERNAL ORGANS.** (3) (Winter) (Prerequisite: permission of instructors.)

PHGY 518 ARTIFICIAL CELLS. (3) (Fall) (Prerequisite: permission of instructors.) Physiology, biotechnology, chemistry and biomedical application of artificial cells, blood substitutes, immobilized enzymes, microorganisms and cells, hemoperfusion, artificial kidneys, and drug delivery systems. PHGY 517 and PHGY 518 when taken together, will give a complete picture of this field. However, the student can select one of these.

★ **PHGY 520 ION CHANNELS.** (3) (Winter) (Offered in even numbered years) (1 1/2 hour lecture, 1 1/2 hour seminar) (Prerequisite: PHGY 311) (Priority to Graduate and Honours students; others by permission of instructors.) A discussion of the principal theories and interesting new developments in the study of ion channels. Based on a textbook, computer exercises and critical reading and presentation of research papers. Topics include: Properties of voltage- and ligand-gated channels, single channel analysis, structure and function of ion channels.

PHGY 531 TOPICS IN APPLIED IMMUNOLOGY. (3) (Winter) (Permission of the instructor. U3 InterDept. Honours Immunology students and graduate students with strong immunology background i.e. PHGY 513 and BIOC 503) Seminar format course in which experts in immunologic mechanisms of resistance against a variety of infectious diseases, including AIDS, malaria, and tuberculosis oversee student moderators in their presentation of recent scientific literature in the field.

PHGY 550 MOLECULAR PHYSIOLOGY OF BONE. (3) (Fall) (1 hour of lecture, 2 hours of seminar per week) (Prerequisites: PHGY 311, and BIOL 202 or equivalent) (Restricted to U3 Physiology students, and graduate students in biomedical departments; others by permission of the instructor) Students will develop a working knowledge of cartilage and bone. Discussion topics will include: molecular and cellular environment of bone; heritable and acquired skeletal defects; research models used to study metabolic bone disease.

PHGY 552 CELLULAR AND MOLECULAR PHYSIOLOGY. (3) (Winter) (1 hour lecture, 2 hours seminar weekly) (Prerequisite: PHGY 311) (Preference will be given to Physiology Honours and Graduate students) Discussions of recent significant advances in our understanding of the gene products involved in diverse cellular signalling pathways. Topics will include cell-surface hormone receptors, nuclear steroid hormone receptors, and ion channels and transporters. Students will present and critically evaluate experimental approaches, results and interpretations of selected research publications.

PHGY 556 TOPICS IN SYSTEMS NEUROSCIENCE. (3) (Winter) (Permission of the instructor required.) (Not open to students who have taken PHGY 456) Topics of current interest in systems neurophysiology and behavioural neuroscience including: the neural representation of sensory information and motor behaviours, models of sensory motor integration, and the computational analysis of problems in motor control and perception. Students will be expected to present and critically discuss journal articles in class.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

PHYS – Physics

Offered by: Department of Physics
Former Teaching Unit Code: 198

PHYS 101 and PHYS 102 together satisfy the minimum requirement in physics for Medical School.

PHYS 101 INTRODUCTORY PHYSICS - MECHANICS. (4) (Fall) (3 hours lectures; 2 hours laboratory; tutorial sessions) (Not open to students taking or having taken PHYS 131, CEGEP objective 00UR or equivalent) (Laboratory sections have limited enrolment) The object of this course is to give the students a basic understanding of the principles of physics, illustrating these, where possible, with current examples of their use in biology and medicine.

PHYS 102 INTRODUCTORY PHYSICS - ELECTROMAGNETISM. (4) (Winter) (3 hours lectures; 2 hours laboratory; tutorial sessions) (Prerequisite: PHYS 101. Corequisite: MATH 139) (Not open to students taking or having taken PHYS 142, CEGEP objective 00UR or equivalent) (Laboratory sections have limited enrolment) Electric field and potential. D.C. circuits and measurements. Capacitance. Magnetic field and induction. A.C. circuits Semiconductor devices and their application. Electromagnetic waves.

PHYS 107 MECHANICS LABORATORY (LIFE SCIENCES). (1) (Fall) (Prerequisite: Lecture component of PHYS 101 or equivalent) (Restriction: Not open to students who have taken or are taking PHYS 101) The laboratory component of PHYS 101.

PHYS 108 E&M LABORATORY (LIFE SCIENCES). (1) (Winter) (Prerequisite: Lecture component of PHYS 102 or equivalent) (Restriction: Not open to students who have taken or are taking PHYS 102) The laboratory component of PHYS 102.

PHYS 117 MECHANICS LABORATORY. (1) (Fall) (Prerequisite: Lecture component of PHYS 131 or equivalent) (Restriction: Not open to students who have taken or are taking PHYS 131) The laboratory component of PHYS 131.

PHYS 118 E & M LABORATORY. (1) (Winter) (Prerequisite: Lecture component of PHYS 142 or equivalent) (Restriction: Not open to students who have taken or are taking PHYS 142) The laboratory component of PHYS 142.

PHYS 131 MECHANICS AND WAVES. (4) (Fall) (3 hours lectures; 1 hour tutorial, 3 hours laboratory in alternate weeks; tutorial sessions) (Corequisite: MATH 139) (Not open to students taking or having taken PHYS 101, CEGEP objective 00UR or equivalent) (Laboratory sections have limited enrolment) The basic laws and principles of Newtonian mechanics; oscillations and waves.

PHYS 142 ELECTROMAGNETISM AND OPTICS. (4) (Winter) (3 hours lectures, 3 hours laboratory in alternate weeks; tutorial sessions) (Prerequisite: PHYS 131. Corequisite: MATH 141) (Not open to students taking or having taken PHYS 102, CEGEP objective 00UR or equivalent) (Laboratory sections have limited enrolment) The basic laws of electricity and magnetism; geometrical and physical optics.

PHYS 200 SPACE, TIME AND MATTER. (3) (Fall) (3 hours lectures) (Not open to students in a Physics program) A nonmathematical, conceptual look at physics, beginning with the idea of space and time, continuing with the historical development of Newtonian mechanics of celestial motion, electricity and magnetism, ether and light, Einstein's special and general theories of relativity, quantum mechanics, matter and antimatter, cosmology and the big bang.

● **PHYS 204 PLANETS, STARS AND GALAXIES.** (3) (Fall and Winter) (3 hours lectures; 3 evening periods for star identification and use of telescopes) (Not open to students who have taken or are taking PHYS 214)

PHYS 205 OUR EVOLVING UNIVERSE. (3) (Fall) (Restrictions: Not open to students in a physics program. Not open to students who have taken PHYS 204.) An elementary course on astronomy and astrophysics. Positional astronomy and finding your way about the sky. Our evolving picture of the universe. Properties and origins of the solar system. The Big Bang and modern cosmology.

PHYS 206 THE MILKY WAY INSIDE AND OUT. (3) (Winter) (Restrictions: Not open to students in a Physics program. Not open to students who have taken PHYS 204.) An elementary course on astronomy. Star origins and star formation, supernovae, white dwarfs, neutron stars, and black holes. Galaxies, their structure and their interactions. Stellar clusters, the interstellar medium. Galactic classification and galaxy evolution.

● **PHYS 208 INTRODUCTION TO SELECTED TOPICS IN PHYSICS.** (1) (Fall) (2 hours lectures, first six weeks) (Not open to students in Physics programs)

PHYS 214 INTRODUCTORY ASTROPHYSICS. (3) (Fall) (Prerequisite: CEGEP Physics) (Not open to students who have taken or are taking PHYS 204) An introduction to astrophysics with emphasis placed on methods of observation and current models. Stellar radiation and detectors, quasars, black holes. Galaxies, large scale structure of the universe, cosmology.

PHYS 224 PHYSICS AND PSYCHOPHYSICS OF MUSIC. (3) (Fall) (3 hours lectures) (Designed for students in the Faculty of Music but suitable for students with an interest in music, and how it is perceived) (Prerequisite: none) An introduction to physics and psychophysics of music with demonstrations of the relevant phenomena and the theories explaining them. Pitch, loudness and timbre in the context of the physics properties of the human ear. The basic physics of music production including modes of oscillation of mechanical systems, resonance, feedback, transmission and reflection of sound. The human voice. Modern methods of sound production using electrical analogue devices and digital computers. Room reverberation and acoustics.

PHYS 225 MUSICAL ACOUSTICS. (3) (Winter) (3 hours lectures) (Prerequisites: CEGEP physics or both MATH 112 and PHYS 224) (Designed for students in music who have interests in sound recording and reproduction and also suitable for students in science with an interest in music) Physical acoustics with applications to music. Resonators and radiators, acoustic impedance. Acoustic properties of strings, bars, membranes, pipes and horns. Application to selected musical instruments. Direction characteristics of sound sources. Room acoustics.

PHYS 230 DYNAMICS OF SIMPLE SYSTEMS. (3) (Fall) (3 hours lectures) (Prerequisite: CEGEP physics. Corequisite: MATH 222) (Not open to students taking or having passed PHYS 251) Translational motion under Newton's laws; forces, momentum, work/energy theorem. Special relativity; Lorentz transforms, relativistic mechanics, mass/energy equivalence. Topics in rotational dynamics. Noninertial frames.

PHYS 232 HEAT AND WAVES. (3) (Winter) (3 hours lectures) (Prerequisite: PHYS 230) (Not open to students taking or having passed PHYS 253) First and second laws of thermodynamics, kinetic theory of gases, optical interference, polarization, electro-optics, physics of microscopic systems.

PHYS 241 SIGNAL PROCESSING. (3) (Winter) (2 hours lectures; 3 hours laboratory alternate weeks) (Prerequisite: CEGEP physics) Linear circuit elements, resonance, network theorems, diodes, transistors, amplifiers, feedback, integrated circuits.

PHYS 242 ELECTRICITY AND MAGNETISM. (2) (Winter) (2 hours lectures) (Prerequisites: CEGEP Physics, MATH 222) Properties of electromagnetic fields, dipole and quadrupole fields and their interactions, chemical binding of molecules, electromagnetic properties of materials, Maxwell's equations and properties of electromagnetic waves, propagation of waves in media.

PHYS 251 CLASSICAL MECHANICS 1. (3) (Fall) (3 hours lectures) (Prerequisite: CEGEP physics. Corequisite: MATH 222) (Not open to students taking or having taken PHYS 230.) Newton's laws, work energy, angular momentum. Harmonic oscillator, forced oscillations. Inertial forces, rotating frames. Central forces, centre of mass, planetary orbits, Kepler's laws.

PHYS 253 THERMAL PHYSICS. (3) (Fall) (3 hours lectures) (Prerequisite: CEGEP physics. Corequisite: MATH 222) (Not open to students taking or having taken PHYS 232) Energy, work, heat; first law. Temperature, entropy; second law. Absolute zero; third law.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

Equilibrium, equations of state, gases, liquids, solids, magnets; phase transitions.

PHYS 257 EXPERIMENTAL METHODS 1. (3) (Fall) (6 hours of laboratory and classroom work) (Corequisite: PHYS 230 or PHYS 251) Introductory laboratory work and data analysis as related to mechanics, optics and thermodynamics. Introduction to computers as they are employed for laboratory work, for data analysis and for numerical computation. Previous experience with computers is an asset, but is not required.

PHYS 258 EXPERIMENTAL METHODS 2. (3) (Winter) (6 hours of laboratory and classroom work) (Prerequisite: PHYS 257) Advanced laboratory work and data analysis as related to mechanics, optics and thermodynamics. Computers will be employed routinely for data analysis and for numerical computation, and, particularly, to facilitate the use of Fourier methods.

PHYS 260 MODERN PHYSICS AND RELATIVITY. (3) (Fall) (3 hours lectures) (Corequisite: MATH 222) History of special relativity; Lorentz transformations: kinematics and dynamics; transformation of electric and magnetic forces; introduction to topics in modern physics.

PHYS 271 QUANTUM PHYSICS. (3) (Winter) ((3-0-6)) (Prerequisite: PHYS 251 or CIVE 281) The observed properties of atoms and radiation from atoms. Electron waves. The Schrodinger Equation in one dimension. Quantum mechanics of the hydrogen atom. Angular momentum and spin. Quantum mechanics of many electron systems. Basic ideas of electrons in solids and solid state physics.

PHYS 328 ELECTRONICS. (3) (Fall) (2 hours lectures; 3 hours laboratory) (Prerequisite: PHYS 241 or permission of instructor) Semiconductor devices, basic transistor circuits, operational amplifiers, combinatorial and sequential logic, integrated circuits, analogue to digital converters. The laboratory component covers design, construction and testing of basic electronic circuits.

PHYS 331 TOPICS IN CLASSICAL MECHANICS. (3) (Winter) (3 hours lectures) (Prerequisite: PHYS 230. Corequisite: MATH 315) (Not open to students having passed PHYS 451) Forced and damped oscillators, Newtonian mechanics in three dimensions, rotational motion, Lagrangian mechanics, small vibrations, normal modes. Introduction to Hamiltonian mechanics.

● **PHYS 332 PHYSICS OF FLUIDS.** (3) (Winter) (3 hours lectures) (Prerequisites: PHYS 230, MATH 223, MATH 314, MATH 315)

PHYS 333 THERMAL AND STATISTICAL PHYSICS. (3) (Winter) (3 hours lectures) (Prerequisite: PHYS 232) (Not open to students taking or having passed PHYS 362) Introductory equilibrium statistical mechanics. Quantum states, probabilities, ensemble averages. Entropy, temperature, Boltzmann factor, chemical potential. Photons and phonons. Fermi-Dirac and Bose-Einstein distributions; applications.

PHYS 334 ADVANCED MATERIALS. (3) (Fall) (Prerequisites: CHEM 110, CHEM 120 or CHEM 111, CHEM 121 and PHYS 101, PHYS 102 or PHYS 131, PHYS 142, or CEGEP Physics and Chemistry, or equivalent. Pre- or Co-requisite: one of CHEM 203, CHEM 204, CHEM 213, CHEM 214 or equivalent; or one of PHYS 230 and PHYS 232, or equivalent; or permission of instructor) (Not open to students who have taken or are taking CHEM 334) The physico-chemical properties of advanced materials. Topics discussed include photonics, information storage, 'smart' materials, biomaterials, clean energy materials, porous materials, and polymers.

PHYS 339 MEASUREMENTS LABORATORY IN GENERAL PHYSICS. (3) (Winter) (6 hours) (Prerequisite: PHYS 241) Introduction to modern techniques of measurement. The use of computers in performing and analysing experiments. Data reduction, statistical methods, report writing. Extensive use of computers is made in this laboratory; therefore some familiarity with computers and computing is an advantage.

PHYS 340 ELECTRICITY AND MAGNETISM. (3) (Fall) (3 hours lectures) (Prerequisites: CEGEP physics, Mathematics MATH 222, MATH 223. Corequisites: MATH 314, MATH 315 or equivalent. Not open to students who have passed PHYS 242 or PHYS 350) The

electrostatic field and scalar potential. Dielectric properties of matter. Energy in the electrostatic field. Methods for solving problems in electrostatics. The magnetic field. Induction and inductance. Energy in the magnetic field. Magnetic properties of matter. Maxwell's equations. A vector treatment.

PHYS 342 ELECTROMAGNETIC WAVES. (3) (Winter) (3 hours lectures) (Prerequisites: PHYS 340 or PHYS 242, Mathematics MATH 314, MATH 315) (Not open to students having passed ECSE 357) Maxwell's equations. The wave equation. The electromagnetic wave, reflection, refraction, polarization. Guided waves. Transmission lines and wave guides. Vector potential. Radiation. The elemental dipole; the half-wave dipole; vertical dipole; folded dipoles; Yagi antennas. Accelerating charged particles.

PHYS 350 ELECTROMAGNETISM. (3) (Fall) (3 hours lectures) (Prerequisites: MATH 248, MATH 325. Honours students or permission of the instructor) (Not open to students having taken PHYS 340) Fundamental laws of electric and magnetic fields in both integral and differential form.

PHYS 352 ELECTROMAGNETIC WAVES. (3) (Fall) (3 hours lectures) (Prerequisite: PHYS 350. Honours students, or permission of the instructor) Vector and scalar potentials; plane waves in homogeneous media; refraction and reflection; guided waves; radiation from simple systems; dipole and quadrupole radiation; introduction to fields of moving charges; synchrotron radiation; Bremsstrahlung.

PHYS 357 QUANTUM PHYSICS. (3) (Fall) (3 hours lectures) (Honours students or permission of instructor) (Not open to students taking or having passed PHYS 446) Experimental basis for quantum mechanics; wave-packets; uncertainty principle. Hilbert space formalism. Schrodinger equation: eigenvalues and eigenvectors: applications to 1-d problems including the infinite and finite potential wells and the harmonic oscillator. Tunneling. Time independent perturbation theory.

PHYS 359 LABORATORY IN MODERN PHYSICS. (3) (Winter) (6 hours) (Corequisite: PHYS 457. Honours students or permission of instructor) Advanced level experiments in modern physics stressing quantum effects and some properties of condensed matter.

PHYS 362 STATISTICAL MECHANICS. (3) (Winter) (3 hours lectures) (Prerequisites: MATH 248 or equivalents, PHYS 253. Honours students, or permission of the instructor) (Not open to students taking or having taken PHYS 333) Quantum states and ensemble averages. Fermi-Dirac, Bose-Einstein and Boltzmann distribution functions and their applications.

★ **PHYS 413 PHYSICAL BASIS OF PHYSIOLOGY.** (3) (Fall) (3 hours lectures) (Prerequisite: MATH 315, or MATH 325, and permission of the instructor) (Intended for Major or Honours students in Physics, Physiology, Physiology and Physics, or Mathematics and others with permission) Analytic and computer simulation techniques are used to examine the role of nonlinearities and time delays in determining the dynamic behaviour of physiological control systems and their relation to normal and pathophysiological states. Examples drawn from the control of respiration, cellular proliferation and differentiation, biochemical feedback networks, thermoregulatory mechanisms, and neural feedback.

PHYS 434 OPTICS. (3) (Winter) (3 hours lectures) Geometrical optics, wave optics, lasers, Fourier transform spectroscopy, holography, optical data processing, stellar interferometry.

PHYS 436 MODERN PHYSICS. (3) (Winter) (3 hours lectures) (Prerequisite: PHYS 446) (Not open to students in Honours Physics or in Joint Honours in Mathematics and Physics) One electron atoms, radiation, multielectron atoms, molecular bonds. Selected topics from condensed matter, nuclear and elementary particle physics.

PHYS 439 LABORATORY IN MODERN PHYSICS. (3) (Fall) (6 hours) (Prerequisite: PHYS 339. Corequisite: PHYS 446) (Not open to students with credit in PHYS 359 except with permission of instructor) Advanced level experiments in modern physics stressing quantum effects and some properties of condensed matter.

PHYS 446 QUANTUM PHYSICS. (3) (Fall) (3 hours lectures) (Prerequisite: PHYS 230 and PHYS 232, or PHYS 251) (Not open to students taking or having taken PHYS 357 or PHYS 457) de Broglie

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

waves, Bohr atom. Schroedinger equation, wave functions, observables. One dimensional potentials. Schroedinger equation in three dimensions. Angular momentum, hydrogen atom. Spin, experimental consequences.

PHYS 449 PROJECT LABORATORY. (3) (Winter) (6 hours) (Prerequisite: PHYS 328, PHYS 439) Supervised project work in an area related to material covered in upper year courses.

PHYS 451 CLASSICAL MECHANICS. (3) (Winter) (3 hours lectures) (Prerequisite: PHYS 251. Honours students, or permission of instructor) (Not open to students having taken PHYS 331) Rigid bodies, angular momentum, gyroscope, moment of inertia, principal axes, Euler's equations. Coupled oscillations and normal modes. Lagrangian mechanics and applications. Hamiltonian mechanics. Topics in advanced analytical mechanics.

PHYS 457 QUANTUM PHYSICS. (3) (Winter) (3 hours lectures) (Honours students or permission of instructor) (Not open to students having taken PHYS 446) Angular momentum and spin operators. Operator methods in quantum mechanics. Coupling of spin and angular momenta. Variational principles and elements of time dependent perturbation theory (the Golden Rule). Solution of the Schrodinger equation in three dimensions. Applications to the hydrogen and helium atoms and to simple problems in atomic and molecular physics.

PHYS 459D1 HONOURS RESEARCH PROJECT. (3) (Fall) (6 hours) (Honours students or permission of instructor) (Not open to students taking the sequence PHYS 469, PHYS 479) (Students must also register for PHYS 459D2) (No credit will be given for this course unless both PHYS 459D1 and PHYS 459D2 are successfully completed in consecutive terms) An experimental project, supervised by members of staff, on some topic related to the ongoing research in the department.

PHYS 459D2 HONOURS RESEARCH PROJECT. (3) (Winter) (Prerequisite: PHYS 459D1) (No credit will be given for this course unless both PHYS 459D1 and PHYS 459D2 are successfully completed in consecutive terms) See PHYS 459D1 for course description.

PHYS 469 LABORATORY IN MODERN PHYSICS 2. (3) (Fall) (6 hours) (Honours students, or permission of instructor) (Prerequisite: PHYS 359) (Not open to students taking PHYS 459) Advanced level experiments in modern physics stressing quantum effects and some properties of condensed matter. Continuation of PHYS 359.

PHYS 479 HONOURS PROJECT LABORATORY. (3) (Winter) (6 hours) (Honours students, or permission of instructor) (Prerequisite: PHYS 469) (Not open to students taking PHYS 459) Supervised project work in an area related to material covered in upper year courses.

PHYS 489 SPECIAL PROJECT. (3) (Winter) (6 hours) (Only open to students in their final year of the Joint Major in Physics and Computer Science after consultation with the adviser(s) for the program) A project incorporating aspects of both physics and computer science, under the joint supervision of the two departments. The Physics aspect may be either laboratory-based or theoretical in nature. The Computational aspect will involve the development and implementation of algorithms arising from the investigation.

PHYS 514 GENERAL RELATIVITY. (3) (Winter) (3 hours lectures) (Honours students, or permission of the instructor) Transition from special to general relativity. Non-Euclidian geometry. The basic laws of Physics in co-variant form, Einstein's equations. Gravitational waves; neutron stars; black holes; cosmology.

PHYS 521 ASTROPHYSICS. (3) (Fall) (3 hours) A quantitative course in galactic and extragalactic astrophysics. Topics include observational techniques, stars and stellar evolution, compact objects, galaxy structure, kinematics, evolution and cosmology.

PHYS 534 NANOSCIENCE AND NANOTECHNOLOGY. (3) (Fall) Topics include scanning probe microscopy, chemical self-assembly, computer modeling, and microfabrication/micromachining.

PHYS 551 QUANTUM THEORY. (3) (Fall) (3 hours lectures) (Honours students, or permission of the instructor) General formulation, scattering theory, WKBJ approximation, time-dependent perturba-

tion, theory and applications, angular momentum, relativistic wave equations.

PHYS 557 NUCLEAR PHYSICS. (3) (Fall) (3 hours lectures) (Honours students, or permission of the instructor) General nuclear properties, nucleon-nucleon interaction and scattering theory, radioactivity, nuclear models, nuclear reactions.

PHYS 558 SOLID STATE PHYSICS. (3) (Fall) (3 hours lectures) (Honours students, or permission of the instructor) Properties of crystals, lattice vibrations and thermal properties of insulators, free electron model and band structure, semi-conductors, metals, optical properties.

PHYS 559 ADVANCED STATISTICAL MECHANICS. (3) (Fall) (3 hours lectures) (Honours students, or permission of the instructor) Self averaging and central-limit theorem; thermodynamic fluctuations; ensemble theory; surface roughening; broken symmetry and Goldstone's theorem; phase transitions; mean-field, Landau and Ornstein-Zernicke theory; Monte Carlo method; molecular dynamics; scaling; renormalization group; epsilon expansion; non-equilibrium theory.

PHYS 562 ELECTROMAGNETIC THEORY. (3) (Winter) (3 hours lectures) (Honours students, or permission of the instructor) Electrostatics, dielectrics, magnetostatics, timevarying fields, relativity, radiating systems, fields of moving charges.

PHYS 567 PARTICLE PHYSICS. (3) (Winter) (3 hours lectures) (Honours students, or permission of the instructor) Survey of elementary particles; hadrons, leptons and hardrons' constituents (quarks). Invariance principles and conservation laws. Detectors and accelerators. Phenomenology of strong, electromagnetic and weak interactions.

PSYC – Psychology

Offered by: Department of Psychology
Former Teaching Unit Code: 204

A basic introductory course in psychology is a prerequisite for all Psychology courses with the following exceptions: PSYC 100, PSYC 204, PSYC 211, PSYC 212, PSYC 213, PSYC 215, PSYC 305.

All courses are open to students other than Major and Honours students in Psychology provided the prerequisites are met and unless otherwise specified.

PSYC 100 INTRODUCTION TO PSYCHOLOGY. (3) (Fall) (2 lectures; 1 conference) (Not open to students who have passed an Introductory Psychology course in CEGEP: 350-101 or 350-102 or equivalent) Introduction to the scientific study of mind and behavior. Learning, perception, motivation and thinking are explained in a way which emphasizes the continuity of human behavior and the behavior of other species, and which emphasizes the role of the central nervous system in organizing and regulating behavior.

PSYC 204 INTRODUCTION TO PSYCHOLOGICAL STATISTICS. (3) (Fall and Winter) (2 lectures, 1 conference) (Not open to students who have passed a CEGEP statistics course(s) with a minimum grade of 75%: Mathematics 201-307 or 201-337 or equivalent or the combination of Quantitative Methods 300 with Mathematics 300) (This course is a prerequisite for PSYC 305, PSYC 406, PSYC 310, PSYC 336) (Credit for other statistics courses may preclude credit for this course and conversely.) The statistical analysis of research data; frequency distributions; graphic representation; measures of central tendency and variability; elementary sampling theory and tests of significance.

PSYC 211 INTRODUCTORY BEHAVIOURAL NEUROSCIENCE. (3) (Winter) (2 lectures) (Prerequisite: PSYC 100 or equivalent) An introduction to contemporary research on learning, memory and motivation, from behavioural, biological and evolutionary perspectives. Topics include: internal and external influences on behaviour, biological constraints on motivation and learning, conditioning and cognitive processes. Much of the material will be drawn from the experimental literature on research with animals.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

PSYC 212 PERCEPTION. (3) (Fall) (2 lectures, 1 conference) Perception is the organization of sensory input into a representation of the environment. Topics include: survey of sensory coding mechanisms (visual, auditory, tactile, olfactory, gustatory), object recognition, spatial localization, perceptual constancies and higher level influences.

PSYC 213 COGNITION. (3) (Winter) (2 lectures, 1 conference) The study of human information processing. What is the nature of thought? How does it arise in the mind and brain? How can empirical research inform these questions? This course presents a survey of major topics and controversies in the study of cognition, emphasizing interdisciplinary approaches.

PSYC 215 SOCIAL PSYCHOLOGY. (3) (Fall) (3 lectures) (Not open to students who have taken PSYC 330, MGCR 221 or SOCI 216) The course offers students an overview of the major topics in social psychology. Three levels of analysis are explored beginning with individual processes (e.g., attitudes, attribution), then interpersonal processes (e.g., attraction, communication, love) and finally social influence processes (e.g., conformity, norms, roles, reference groups).

PSYC 301 LEARNING. (3) (Fall) (Prerequisite(s): PSYC 211 or PSYC 213 or permission of instructor.) (Not open to students who have taken PSYC 211 prior to the 2000-01 academic year.) An introduction to contemporary and historical psychological research on learning from a behavioural, cognitive and biological perspective. Topics include classical and instrumental conditioning, cognitive learning processes, and biological constraints. The status and history of North American behaviourism will be discussed and compared with cognitive and other approaches.

PSYC 304 CHILD DEVELOPMENT. (3) (Fall) (2 lectures, 1 conference) (Prerequisites: two courses from PSYC 211, PSYC 212, PSYC 213, and PSYC 215 or permission of the instructor) (This course is a prerequisite for PSYC 412, PSYC 413, PSYC 414, PSYC 416) A basic introduction to developmental psychology. Various aspects of psychological development in children are considered, including prenatal development and infancy, perceptual and cognitive development, language acquisition, social and personality development and social interaction.

PSYC 305 STATISTICS FOR EXPERIMENTAL DESIGN. (3) (Fall and Winter) (Prerequisite: PSYC 204 or equivalent) (This course is required of all students who propose to enter an Honours or Major program in Psychology) (Credit for other statistics courses may preclude credit for this course and conversely) An introduction to the design and analysis of experiments, including analysis of variance, planned and post hoc tests and a comparison of anova to correlational analysis.

PSYC 308 BEHAVIOURAL NEUROSCIENCE 1. (3) (Fall) (2 lectures, 1 conference) (Prerequisite: BIOL 111 or BIOL 112 or BIOL 115 or equivalent) (Not open to students who have taken or are taking PHGY 314) The neural basis of mammalian behavior. Basic neuroanatomy, neurophysiology and neurochemistry. Sensory and motor systems. How the nervous system acquires and integrates information and uses it to produce behavior.

● **PSYC 310 HUMAN INTELLIGENCE.** (3) (2 lectures) (Prerequisite: PSYC 204 or any equivalent course)

PSYC 311 HUMAN COGNITION AND THE BRAIN. (3) (Fall) (2 lectures, 1 conference) The course is an introduction to the field studying how human cognitive processes, such as perception, attention, language, learning and memory, planning and organization, are related to brain processes. The material covered is primarily based on studies of the effects of different brain lesions on cognition and studies of brain activity in relation to cognitive processes with modern functional neuroimaging methods.

● **PSYC 316 PSYCHOLOGY OF DEAFNESS.** (3) (Winter) (2 lectures; 1 conference) (Prerequisite: PSYC 100 or equivalent or permission of instructor) (Not open to students who have taken PSYC 457)

PSYC 317 GENES AND BEHAVIOUR. (3) (Winter) (Pre-requisite: PSYC 211 or PSYC 308 or BIOL 306 or PHGY 314 or permission

of instructor.) Focuses on current techniques employed to study which genes influence behaviour, and how they do so.

PSYC 318 BEHAVIOURAL NEUROSCIENCE 2. (3) (Winter) (2 lectures, 1 conference) (Prerequisite: PSYC 308 or PSYC 311 or BIOL 306 or PHGY 314) Physiological bases of motivation including feeding and drinking, sexual and parental behaviour. Physiological processes in reinforcement and learning.

● **PSYC 331 INTER-GROUP RELATIONS.** (3) (2 lectures) (Prerequisite: PSYC 215)

PSYC 332 INTRODUCTION TO PERSONALITY. (3) (Winter) (3 lectures) (Prerequisite: PSYC 100) This course examines some of the major theories of personality, e.g., those of Freud, Rogers, and Bandura. Empirical research inspired by these theories will also be examined. Topics include the nature of human motivation, the role of the self-concept, and the consistency and stability of personality.

PSYC 333 PERSONALITY AND SOCIAL PSYCHOLOGY. (3) (Fall) (2 lectures) (Prerequisite: PSYC 215) The course will consider traditional approaches to person-situation interactions and a more dynamic approach based on recent research on goals and social cognition.

● **PSYC 336 MEASUREMENT OF PSYCHOLOGICAL PROCESSES.** (3) (3 lectures) (Prerequisites: PSYC 204 and Introductory Calculus)

PSYC 337 INTRODUCTION: ABNORMAL PSYCHOLOGY 1. (3) (Fall) (2 lectures, 1 conference) (This course is prerequisite for PSYC 338) A survey of the genetic, physiological and environmental origins of intellectual and emotional disorders.

PSYC 338 INTRODUCTION: ABNORMAL PSYCHOLOGY 2. (3) (Winter) (2 lectures, 1 conference) (Prerequisite: PSYC 337) (This course is prerequisite for PSYC 491) An introduction to psychotic behaviour problems, character disorders and behaviour modification.

PSYC 340 PSYCHOLOGY OF LANGUAGE. (3) (Winter) A survey of issues in psycholinguistics, focusing on the nature and processing of language (e.g., how we understand speech sounds, words, sentences, and discourse). Also surveyed: language and thought, the biological foundations of language, and first language acquisition.

● **PSYC 341 THE PSYCHOLOGY OF BILINGUALISM.** (3) (2 lectures) (Prerequisites: Introductory Psychology, and PSYC 340 or introduction to linguistics; or permission of instructor)

PSYC 342 HORMONES AND BEHAVIOUR. (3) (Winter) (2 lectures) (Prerequisite: BIOL 111, BIOL 112, BIOL 115 or equivalent) The role of hormones in organization of CNS function, as effectors of behaviour, in expression of behaviours and in mental illness.

● **PSYC 343 LANGUAGE LEARNING IN CHILDREN.** (3) (2 lectures plus conference)

● **PSYC 351 RESEARCH METHODS IN SOCIAL PSYCHOLOGY.** (3) (1 hour lecture, 6 hour lab and/or field work) (Prerequisite: PSYC 215. Pre-/Co-requisite: PSYC 305. U2 level and above. Requires departmental approval.) (Students will be admitted on the basis of a written application on forms available from the Department (Room N7/9). Applications must be submitted by August 15)

● **PSYC 352 LABORATORY IN COGNITIVE PSYCHOLOGY.** (3) (1 hour lecture, weekly lab) (Prerequisite: PSYC 213. Requires departmental approval.) (Students will be admitted on the basis of a written application on forms available from the Department (Room N7/9).

PSYC 353 LABORATORY IN HUMAN PERCEPTION. (3) (Fall) (1 hour lecture plus 3 hour lab) (Prerequisites: PSYC 212, U2 level or above. Requires departmental approval.) (Students will be admitted on the basis of a written application on forms available from the Department (Room N7/9). Applications must be submitted by August 15) Students will be introduced to standard psychophysical procedures and data analysis techniques, and will have the opportunity to design and carry out their own experiments. Research topics include: visual acuity, form and motion perception, and visual search. Evaluation based on individually written reports on lab experiments.

PSYC 380D1 HONOURS RESEARCH PROJECT AND SEMINAR. (3) (Fall) (3 hour seminar) (For U2 honours students only. Requires departmental approval.) (Students must also register for PSYC

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

380D2) (No credit will be given for this course unless both PSYC 380D1 and PSYC 380D2 are successfully completed in consecutive terms) First laboratory research project.

PSYC 380D2 HONOURS RESEARCH PROJECT AND SEMINAR. (3) (Winter) (Prerequisite: PSYC 380D1) (No credit will be given for this course unless both PSYC 380D1 and PSYC 380D2 are successfully completed in consecutive terms) See PSYC 380D1 for course description.

PSYC 403 MODERN PSYCHOLOGY IN HISTORICAL PERSPECTIVE. (3) (Fall) (2 lectures) A survey of the scientific and ideological influences on psychology from its philosophical beginnings through the period of the schools to its modern situation.

PSYC 406 PSYCHOLOGICAL TESTS AND MEASUREMENTS. (3) (Winter) (2 lectures) (Prerequisite: PSYC 204 or equivalent) An introduction to the theory and practice of psychological measurement in health, educational, clinical and industrial/organizational settings. Attention to procedures for developing and validating assessment devices. Techniques include: intelligence tests, projective tests, questionnaires, structured interviews, rating scales, and behavioural/performance tests.

PSYC 408 PRINCIPLES OF COGNITIVE BEHAVIOUR THERAPY. (3) (Fall) (2 lectures) (Prerequisites: PSYC 337 and PSYC 211 or permission of instructor) An introduction to the theory, research and practice of cognitive behaviour therapy. The experimental approach to understanding human behaviour is used to follow basic principles of learning and their clinical application. Certain psychiatric disorders such as alcoholism and depression are highlighted to illustrate how a behaviour therapist conceptualizes problems and formulates treatments.

PSYC 410 SPECIAL TOPICS IN NEUROPSYCHOLOGY. (3) (Winter) (2 lectures) (Prerequisites: PSYC 311 or PSYC 308. Knowledge of basic neuropsychology at the level covered in PSYC 311 is assumed) This course will trace developments in human brain mapping and in cognitive neuroscience via readings from primary sources. Topics include the neural bases for perception, language, and memory, and their relationship to structural and functional brain organization. Emphasis is placed on integrating knowledge from behavioral lesion experiments and functional activation studies.

PSYC 412 DEVIATIONS: CHILD DEVELOPMENT. (3) (Fall) (2 lectures, 1 conference) (Prerequisite: PSYC 304 or PSYC 337 or permission of instructor. Students will also require a basic knowledge of research design) This course focuses on deviations in the perceptual, cognitive, social, and emotional development of children. Emphasis is placed on research exploring constitutional and environmental causes and symptoms associated with such disorders as depressive spectrum disorders, anxiety disorders, conduct disorder, autism, schizophrenia, attention deficit hyperactivity disorder, eating disorders, and substance abuse.

● **PSYC 413 COGNITIVE DEVELOPMENT.** (3) (3 hours) (Prerequisite: PSYC 304 or PSYC 213 or equivalent)

● **PSYC 414 SOCIAL DEVELOPMENT.** (3) (Prerequisites: PSYC 304 and PSYC 305)

● **PSYC 416 TOPICS IN CHILD DEVELOPMENT.** (3) (Winter) (3 lectures) (Prerequisite: PSYC 304 or permission of instructor) Theory and recent research on child development. Topics will vary, but will concern psychological issues related to infants, children, and adolescents, and will take account of contexts, such as families, schools, peer groups, and cultures.

PSYC 427 SENSORIMOTOR BEHAVIOUR. (3) (Winter) (2 lectures) (Prerequisite: PSYC 308 or permission of instructor) A systematic examination of motor control, drawing on models and data from both behavioural and physiological studies. Topics include: mechanical properties of muscles, motor unit properties and force production; proprioceptors, spinal reflex organization, motor cortex, cerebellum, basal ganglia.

PSYC 429 HEALTH PSYCHOLOGY. (3) (Winter) (2 lectures, 1 conference) (Prerequisite: PSYC 337 or, in the case of advanced undergraduates, permission of instructor) A survey of health psychology

including a review of psychological factors involved in the development of physical illness. Assessment and intervention strategies for problems such as cardiovascular disease, cancer, diabetes, and headaches.

● **PSYC 436 HUMAN SEXUALITY AND ITS PROBLEMS.** (3) (Fall) (Prerequisite: either PSYC 337 or permission of the instructor)

PSYC 450D1 RESEARCH PROJECT AND SEMINAR. (3) (Fall) (Prerequisites: PSYC 204, PSYC 305. Requires departmental approval.) (Only for Major or special students in U3 who intend to proceed to graduate school) (Students will be admitted on the basis of a written application on forms available from the Department (Room N7/9). Applications must be submitted by August 15) (Students must also register for PSYC 450D2) (No credit will be given for this course unless both PSYC 450D1 and PSYC 450D2 are successfully completed in consecutive terms) Under supervision of an adviser approved by the Department, students design and carry out a research project. Students report their research in seminars throughout the year and in a final written report.

PSYC 450D2 RESEARCH PROJECT AND SEMINAR. (3) (Winter) (Prerequisite: PSYC 450D1) (No credit will be given for this course unless both PSYC 450D1 and PSYC 450D2 are successfully completed in consecutive terms) See PSYC 450D1 for course description.

PSYC 451 HUMAN FACTORS RESEARCH AND TECHNIQUES. (3) (Fall) (2 lectures; 1 lab) (Prerequisites: PSYC 204, PSYC 211, PSYC 212, PSYC 213, PSYC 215 and PSYC 305 or permission of instructor) The application of psychology to the analysis and design of systems and products to increase efficiency and reduce the probability and risk of human error. Topics include: workload and vigilance, control-display relationships, task analysis, and workstation design.

PSYC 470 MEMORY AND BRAIN. (3) (Winter) (3 hour lectures) (Prerequisites: PSYC 308 and PSYC 318 or PHGY 311 or BIOL 306) Memory and amnesia will be studied with an emphasis on the neural mechanisms of information storage in the brain. Topics include: Human memory, developmental plasticity, synaptic plasticity, memory modulators, emotion and memory, short- and long-term memory, sleep, and aging.

PSYC 471 HUMAN MOTIVATION. (3) (Winter) (3 hour lectures) (Prerequisite: PSYC 215) Integrating current goal-based and need-based theories of human motivation. Particular attention will be given to Baumeister's (1998) Theory of self-regulation failure, and Deci and Ryan's (1991) Self-Determination Theory. The relevance of course material to applied issues in the domain of education, sports, and management is highlighted.

● **PSYC 472 SCIENTIFIC THINKING AND REASONING.** (3) (2 lectures, 1 conference) (Prerequisites: U3 students only; BIOL 210 or at least 2 courses in the Faculty of Science at the 200 level) (Open to Arts and Science students)

● **PSYC 473 SOCIAL COGNITION AND THE SELF.** (3) (Winter) (2 lectures) (Prerequisites: PSYC 215 and PSYC 333 or PSYC 331 or PSYC 474) (Not open to students who have taken PSYC 411)

PSYC 474 INTERPERSONAL RELATIONSHIPS. (3) (Winter) (Prerequisite: PSYC 215, PSYC 204, and PSYC 333 or permission of instructor) Psychological science approach to interpersonal relationships. Organized in terms of the development of relationships, focusing first on impression formation as a platform for the development of relationships. Then we focus on close relationships, examining interpersonal constructs (intimacy, trust, commitment) and reconsidering social cognitive constructs (attributions, schemas) in an interpersonal context.

PSYC 481D1 HONOURS THESIS RESEARCH. (3) (Fall) (9 hours. Research) (U3 Honours students only) (Please see regulations concerning Project Courses) (Prerequisite: PSYC 380D1/PSYC 380D2) (Students must also register for PSYC 481D2) (No credit will be given for this course unless both PSYC 481D1 and PSYC 481D2 are successfully completed in consecutive terms) Under the supervision of an adviser approved by the Department, students design and carry out a research project and report their results in the form of an undergraduate thesis.

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

PSYC 481D2 HONOURS THESIS RESEARCH. (3) (Winter) (Prerequisite: PSYC 481D1) (No credit will be given for this course unless both PSYC 481D1 and PSYC 481D2 are successfully completed in consecutive terms) See PSYC 481D1 for course description.

PSYC 482 ADVANCED HONOURS SEMINAR 1. (3) (Fall) (Not open to students who have taken 204-480D) (2 lectures) (For Honours students only) Critical examination of the assumptions, concepts, ethics, empirical methods and integrative ideas of modern psychology.

PSYC 483 ADVANCED HONOURS SEMINAR 2. (3) (Winter) (Not open to students who have taken 204-480D) (2 lectures) (For Honours students only) Critical examination of the assumptions, concepts, ethics, empirical methods and integrative ideas of modern psychology.

PSYC 491D1 ADVANCED STUDY: BEHAVIOURAL DISORDERS. (3) (Fall) (1-2 hours lecture or tutorial per week plus a field experience requirement) (Prerequisites: PSYC 337 and PSYC 338. Departmental permission required.) (Students will be admitted on the basis of a written application on forms available from the Department (Room N7/9). Applications must be submitted by August 15) (Students must also register for PSYC 491D2) (No credit will be given for this course unless both PSYC 491D1 and PSYC 491D2 are successfully completed in consecutive terms) A critical examination of topics in abnormal and clinical psychology. Emphasis will be on analysis of theoretical positions and empirical findings as they relate to both etiology and treatment.

PSYC 491D2 ADVANCED STUDY: BEHAVIOURAL DISORDERS. (3) (Winter) (Prerequisite: PSYC 491D1) (No credit will be given for this course unless both PSYC 491D1 and PSYC 491D2 are successfully completed in consecutive terms) See PSYC 491D1 for course description.

PSYC 492 SPECIAL TOPICS SEMINAR 1. (3) (Fall or Winter) (Restricted to U3 students. Requires departmental approval.) (Please see regulations concerning Project Courses.) These seminars are offered by special arrangement between interested Psychology staff and students. Note: A written proposal detailing the plans for the seminar must be approved by the Department Curriculum Committee before the student is permitted to register for this course. This proposal must be received by the Departmental Curriculum Committee well before the beginning of the term for which the seminar is proposed. Consult the Departmental Handbook for additional information.

PSYC 493 SPECIAL TOPICS SEMINAR 2. (3) (Fall or Winter) (Restricted to U3 students. Requires departmental approval.) (Please see regulations concerning Project Courses) These seminars are offered by special arrangement between interested Psychology staff and students. Note: A written proposal detailing the plans for the seminar must be approved by the Department Curriculum Committee before the student is permitted to register for this course. This proposal must be received by the Departmental Curriculum Committee well before the beginning of the term for which the seminar is proposed. Consult the Departmental Handbook for additional information.

PSYC 495 PSYCHOLOGY RESEARCH PROJECT. (3) (Winter) (Prerequisites: 30 credits of the Psychology program including PSYC 305 or equivalent statistics course and CGPA above 3.00. Requires departmental approval.) (Restricted to U3 students) (Not open to students registered in PSYC 380, PSYC 481 or PSYC 450) (Please see regulations concerning Project Courses) Under the supervision of Psychology faculty, students carry out a research project and write a paper describing their results and relating it to the relevant literature. Registration is by special arrangement with Psychology staff, and project proposals must be approved by the Department before registration. For more information see the Psychology Department website.

● **PSYC 496 SENIOR HONOURS RESEARCH 1.** (3) (Prerequisite: PSYC 380D1/PSYC 380D2)

● **PSYC 497 SENIOR HONOURS RESEARCH 2.** (3) (Prerequisite: PSYC 380D1/PSYC 380D2. Corequisite: PSYC 496)

● **PSYC 498D1 SENIOR HONOURS RESEARCH.** (3) (Students must also register for PSYC 498D2) (No credit will be given for this course unless both PSYC 498D1 and PSYC 498D2 are successfully completed in consecutive terms) (Prerequisite: PSYC 380D1/PSYC 380D2) Second two-term laboratory research project.

● **PSYC 498D2 SENIOR HONOURS RESEARCH.** (3) (Prerequisite: PSYC 498D1) (No credit will be given for this course unless both PSYC 498D1 and PSYC 498D2 are successfully completed in consecutive terms)

● **PSYC 501 AUDITORY PERCEPTION.** (3) (2 lectures) (Prerequisite: PSYC 212 or equivalent, or permission of instructor.)

● **PSYC 503 COMPUTATIONAL PSYCHOLOGY.** (3) (Prerequisite: Permission of instructor.) (Not open to U0 or U1 students.)

PSYC 505 THE PSYCHOLOGY OF PAIN. (3) (Fall) (2 lectures; 1 conference) (Prerequisites: any two of the following: PSYC 308, PSYC 311, PSYC 318, PSYC 422, ANAT 321, BIOL 306, PHGY 314 or permission of instructor) An introduction to pain research and theory, with emphasis on the interactions of psychological, cultural and physiological factors in pain perception. The role of these factors in clinical pain and its management by pharmacological and non-pharmacological means will be discussed.

● **PSYC 507 EMOTIONS, STRESS, AND ILLNESS.** (3) (Prerequisites: PSYC 337, PSYC 429 and permission of the instructor.)

● **PSYC 510 STATISTICAL ANALYSIS OF TESTS.** (3) (3 lectures) (Prerequisites: PSYC 305 or PSYC 435, PSYC 406 or permission of instructor)

● **PSYC 511 INFANT COMPETENCE.** (3) (1, 3 hour seminar) (Prerequisites: PSYC 351 or PSYC 352 or PSYC 353 or PSYC 380 or PSYC 450 and permission of instructor)

● **PSYC 522 NEUROCHEMISTRY AND BEHAVIOUR.** (3) (2 lectures) (Prerequisites: any two of the following PSYC 308, PSYC 311, PSYC 318, ANAT 321, PHGY 314, BIOL 306) (Restrictions: Not open to students who have taken or are taking PHAR 562)

PSYC 526 ADVANCES IN VISUAL PERCEPTION. (3) (Fall) (2 lectures) We examine in detail the structure of the visual system, and its function as reflected in the perceptual abilities and behaviour of the organism. Parallels are also drawn with other sensory systems to demonstrate general principles of sensory coding.

● **PSYC 528 VULNERABILITY TO DEPRESSION.** (3) (Prerequisite: PSYC 337 or PSYC 412 or permission of instructor. Requires departmental approval.)

● **PSYC 529 MUSIC COGNITION.** (3) (Prerequisites: PSYC 212, PSYC 213, PSYC 204 (or equivalent))

PSYC 530 APPLIED TOPICS IN DEAFNESS. (3) (Prerequisite: PSYC 340 or PSYC 316 or equivalent. Corequisite: PSYC 343 and permission of instructor) Covers fundamental topics in deafness (sensory, perceptual, cognitive, social, linguistic, education and health issues) from an applied psychological perspective. Lectures and seminar presentations plus field work involving ASL/LSQ.

● **PSYC 531 STRUCTURAL EQUATION MODELS.** (3) (one 2-hour lecture plus one lab) (Prerequisite: PSYC 435, PSYC 651, or equivalent, or permission of instructor)

PSYC 532 COGNITIVE SCIENCE. (3) (Fall) (Prerequisites: Admission to the Cognitive Science Minor or permission of instructor. Students should ideally have some cognitive science background in at least two disciplines) The multi-disciplinary study of intelligent systems. Problems in vision, memory, categorization, choice, problem solving, cognitive development, syntax, language acquisition, and rationality. Rule-based and connectionist approaches.

● **PSYC 533 INTERNATIONAL HEALTH PSYCHOLOGY.** (3) (Prerequisite: PSYC 305 and PSYC 215 or PSYC 429 or PSYC 304 or ANTH 227.) (Departmental permission required.)

● **PSYC 534 COMMUNITY PSYCHOLOGY.** (3) (Prerequisites: PSYC 337 and PSYC 338 or permission of instructor) (Open to Graduate students or U3 undergraduates in Psychology) (Enrolment limited)

● **PSYC 535 ADVANCED TOPICS IN SOCIAL PSYCHOLOGY.** (3) (Prerequisites: PSYC 215, PSYC 333 and one additional course from

Before selecting courses, students should refer to the Course Information and Regulations section beginning on page 354.

the social and personality area of specialization, or PSYC 380. Departmental permission required.) (Graduate Students, enrolment limited)

● **PSYC 536 CORRELATIONAL TECHNIQUES.** (3) (Winter) (Prerequisites: PSYC 204 and PSYC 305 or their equivalents, and MATH 133 or equivalent. Requires departmental approval.)

PSYC 561 METHODS: DEVELOPMENTAL PSYCHOLINGUISTICS. (3) (3 hour lectures) (Prerequisites: PSYC 340, PSYC 343 and PSYC 305 or permission of instructor) (Graduate students, limited enrolment) An examination of various approaches and methods used in investigations of the development of language and communication. The following approaches are discussed along with the representative studies: A case study approach, observational-correlational approach versus experimental-manipulative approach, cross sectional design versus longitudinal design, ethnographic approach.

PSYT – Psychiatry

Offered by: Department of Psychiatry

Former Teaching Unit Code: 555

PSYT 301 ISSUES IN DRUG DEPENDENCE. (3) (Winter) (3 hours) (Prerequisites: PHGY 201 or PHGY 209 or PHGY 210 or PSYC 100 or BIOL 201 or permission of instructor) The phenomenology and epidemiology of the use and abuse of alcohol, nicotine, opiates, stimulants, sedatives and psychotomimetic agents are discussed in relation to current theoretical and experimental issues. The perspective is multidisciplinary and the intention is to develop an understanding of the nature of the issues surrounding drug dependence.

PSYT 500 ADVANCES: NEUROBIOLOGY OF MENTAL DISORDERS. (3) (Winter) (3 hours) (Prerequisites: BIOC 212 and BIOC 311, or BIOC 312, or BIOL 200 and BIOL 201, or PHGY 311, or PSYC 308 and an upper-level biological science course with permission of the instructors, or equivalent. Basic knowledge of cellular and molecular biology is required.) (Open to U3 and graduate students only.) (Graduate Studies: strongly recommended for M.Sc. students in Psychiatry.) Current theories on the neurobiological basis of most well known mental disorders (e.g. schizophrenia, depression, anxiety, dementia). Methods and strategies in research on genetic, physiological and biochemical factors in mental illness will be discussed. Discussion will also focus on the rationale for present treatment approaches and on promising new approaches.

PSYT 502 BRAIN EVOLUTION AND PSYCHIATRY. (3) (Fall) (Prerequisites: BIOL 115 or equivalent as authorized by instructor) The course will focus on the transcendental importance of evolution of nervous systems for normal and pathological behavior. Studies of allometric brain growth and recent evolutionary theories of brain organization as they relate to normal and abnormal behavior will be emphasized.

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