

Course Information and Regulations, page 354

1. Course Numbering
2. Multi-term Courses
3. Course Terminology
4. First-Year Seminars
5. Faculty/School-Specific Information
6. Course Symbols

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)

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.

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 for

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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

FYS classes are limited to a maximum of 25 students and are

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.

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.



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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 science of animal production and management.
104 Texts Principles

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

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

FDESC 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 separa-

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

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.**

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

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

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

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

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

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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.

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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 also r of c0.00Super-0.0006(H)03 Tc0.D00031(2 are succ cof()-5ully0.0(PreTwin14.ervise

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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 G

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- **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**

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 consecu-

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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 TD87course-14.7444 vO8.2ast

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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:

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)

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: Literary05Lhge03-04: c .9(c f)-9.4(o)-1.7(r)JTJ-23.3308 -1.TUDIES

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



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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

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

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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

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 N**

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. Prac

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

HIST – HISTORY (ARTS)

- **HISP 451D1 CERVANTES.** (3) (Fall) (Students must also register for HISP 451D2)
- **HISP 451D2 CERVANTES.**

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.

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

Before selecting courses, students should refer to the Cour

● **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**

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 C

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

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

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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**

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 reg-

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

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

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children, with an emphasis on current theoretically-informed work in this area.

LING 455 SECOND LANGUAGE SYNTAX.

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

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

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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 moderniza-

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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, repub-

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

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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 I-6.7(i)-6.7(i)-6.7(i)-6.7(i)5 -1.12776.36 0ANADIAN

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

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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 P**

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.

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

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

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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. 0002 TcLD0f60i39100001.28 64muni 64j7.98 0 0 7.98 177.6 711.6601es8.36 0 4.98a(coorstin)-7.6(terventions, clinic 06 r

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

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▲ **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.

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 the Arctic on Sib[cmTJ-14.Fs2 7(ationo8 634.J-16.5.7(D) ge8)ty T

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 I**

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

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 instru TD0.0001 Tc-(oce)-7.5(s)4.1(s, le)-75VuS3.7 39fa.f.7218 -1.127so.0009 Tw(((3))-5.O75V

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

EDFE – STUDENT TEACHING (EDUC)

designed to capture information about second language classrooms and programs.

- **EDFE 246 FIRST YEAR FIELD EXPERIENCE (ELEM.).** (3) (Prerequisite: EDKP 342)

EDFE 251 S

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

EDFE 459 FOURTH YEAR F

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

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EDSL 419 SÉMINAIRE PROFESSIONNEL-4E. (3) Analyse réflexive des pratiques d'enseignement propres à l'immersion.

● **EDSL 420 SÉMINAIRE 4 PROFESSIONNEL.** (2)

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 spe-

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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 processes.

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design; dust cleaning methods, design of scrubbers, case studies in the Canadian context.

CHEE 474 BIOCHEMICAL ENGINEERING. (3) (3-0-6) (Prerequisites:

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; c7.5C,0.4(able)-7.5(for pr)-5.3(e05t8 -1.1tt5 pr)si-

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

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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.

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

Before selecting courses, students should refer to the Cour

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 proc-

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, engi-

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 D

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

tions and closed-loop systems. Vibr

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

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

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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 A**

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 P

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

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

INDR 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 I

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 D

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) (Prereq-

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

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

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.

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) (Pre-

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

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)

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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.

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

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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 O

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 FEMININE. (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

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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)

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

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) (No00D2)

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 func-

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 astuTc(NSE0004 Tw-11.10 t)-0.io0)IFEmen evolFu14.76 559.673ermission)

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 Require-

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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

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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

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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 Win-

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

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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 microcomput-

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

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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 S

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 prerequi-

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

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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 application.

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) (3hours)
Introduction to key themes in cult

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

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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.

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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)

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, fa

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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

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 .r b0.00(ning)-7.6(.r b0.00ithd)-21g3]TJ-101.5e-(P(W)-pJ-1016 0(4l7.3(r)2.r18117.320001 7Tf7.02 0 00(ning)-7.6(3a057.9(d17.3.6(.rxy ta)e6 0(4

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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) FaldekY33alc3Cs (F

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 Pk3 P)

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

waves, Bohr atom. Schrodinger equation, wave functions, observ-

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the social and personality area of specialization, or PSYC 380. Departmental permission required.) (Graduate Students, enrolment limited)



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