

1 Agricultural Economics

Department of Agricultural Economics
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Canada

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Adjunct Professors

D. Cyr, M. Desjardins, J. Drouin, S. Inoue, A. Nantel, J. Snipes,
D. Thomas

* Denotes cross or joint appointees.

2.2 Programs Offered

Graduate research activities leading to the presentation of the M.Sc. and Ph.D. thesis involve original experimental work in one of the areas being actively investigated by the Department's Research Supervisors. Current research projects include: cell biology of secretion; cell biology of endocytosis; signal transduction of cell receptors for growth factors and hormones; synthesis and migration of glycoproteins; subcomponents of the Golgi apparatus and their function; biogenesis and function of lysosomes; cell turnover in various tissues; control of cell growth and proliferation; molecular biology of extracellular matrix; structure, composition and function of basement membranes and connective tissue microfibrils; cell and microfibrils; cell and molecular biology of spermatogenesis; genetic expression of proteins in the formation of cytoskeletal components of spermatozoa; role of endocytosis and secretion by epididymal cells in sperm maturation; molecular biology of Sertoli cell secretions and their interaction with germ cells; synchronization of sperm production; transferrin, transferrin receptors and iron in germinal cells; differentiation of B lymphocytes in bone marrow in relation to mechanisms of humoral immunity, immunodeficiency states and B cell neoplasias; control mechanisms and cytokines in B lymphopoiesis; in situ organization and stro

must register for both the D1 and D2 components. No credit will be given unless both components (D1 and D2) are successfully completed in consecutive terms.

The course credit weight is given in parentheses after the title.

- Denotes courses not offered in 2003-04.

ANAT 541 CELL AND MOLECULAR BIOLOGY OF AGING. (3) (Winter) (2 hours lecture, 2 hours conference) (Prerequisites: ANAT 261, ANAT 262, or by special permission) This course will focus on how the complex aging process can be studied by modern cell and molecular approaches. Topics will include discussion on animal model systems for aging, gene regulation controlling the aging process and age-dependent diseases.

- **ANAT 614D1 HUMAN ANATOMY AND EMBRYOLOGY.** (4.5)
- **ANAT 614D2 HUMAN ANATOMY AND EMBRYOLOGY.** (4.5)

ANAT 663D1 HISTOLOGY. (4.5) Students must also register for ANAT 663D2) (No credit will be given for this course unless both ANAT 663D1 and ANAT 663D2 are successfully completed in consecutive terms) The study of the cytology and structure of tissues and aging 8(suc 3e dtol)6clG.0.-0es. T.i674complex in

written English by appropriate exams. DOCUMENTS SUBMITTED WILL NOT BE RETURNED.

Deadlines – Applications, including all supporting documents must reach the Student Affairs Office no later than June 1 (March 1 for International) for the *Fall Term (September)*; October 15 (July 1 for International) for the *Winter Term (January)*; February 15 (November 1 for International) for the *Summer Term (May)*. It may be necessary to delay review of the applicant's file until the following admittance period if application materials including supporting documents are received after these dates. International applicants are advised to apply well in advance of the deadline because immigration procedures may be lengthy. Applicants are encouraged to make use of the on-line application form available on the Web at www.mcgill.ca/applying/graduate.

Application Fee (non-refundable) – A fee of \$60 Canadian must accompany each application (including McGill students), otherwise it cannot be considered. This sum must be remitted using one of the following methods:

1. Credit card (by completing the appropriate section of the application form). NB: on-line applications must be paid for by credit card.
2. **Certified** cheque in Cdn.\$ drawn on a Canadian bank.
3. **Certified** cheque in U.S.\$ drawn on a U.S. bank.
4. Canadian Money order in Cdn.\$.
5. U.S. Money Order in U.S.\$.
6. An international draft in Canadian funds drawn on a Canadian bank requested from the applicant's bank in his/her own country.

Transcripts – Two official copies of all transcripts with proof of degree(s) granted are required for admission. Transcripts written in a language other than English or French must be accompanied by a certified translation. An explanation of the grading system used by the applicant's university is essential. It is the applicant's responsibility to arrange for transcripts to be sent.

It is desirable to submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. Applicants must be graduates of a university of recognized reputation and hold a Bachelor's degree equivalent to a McGill Honours degree in a subject closely related to the one selected for graduate work. This implies that about one-third of all undergraduate courses should have been devoted to the subject itself and another third to cognate subjects.

Letters of Recommendation – Two letters of recommendation *on letterhead (official paper) or bearing the university seal* and with original signatures from two instructors familiar with the applicant's work, preferably in the applicant's area of specialization, are required. It is the applicant's responsibility to arrange for these letters to be sent.

Competency in English – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams, e.g., TOEFL (minimum score 550 or 213 on computerized test) or IELTS (minimum 6.5 overall band). The MCHC is not considered equivalent. Results must be submitted as part of the application. The University code is 0935 (McGill University, Montreal); please use Department code 31 (Graduate Schools), Biological Sciences - Agriculture, to ensure that your TOEFL reaches this office without delay.

Graduate Record Exam (GRE) – The GRE is not required, but it is highly recommended.

Financial aid is very limited and highly competitive. It is tf-144g

up-to-date list of courses available; courses may have been added, rescheduled or cancelled after this Calendar went to press. Class Schedule lists courses by term and includes days, times, locations, and names of instructors.

Courses with numbers ending D1 and D2 are taught in two consecutive terms (most commonly Fall and Winter). Students must register for both the D1 and D2 components. No credit will be

ANSC 798 ANIMAL SCIENCE SEMINAR 4. (1) (1 hour) One of two seminars to be given by all students in a Ph.D. program. Presentation of a current scientific topic which is not related to the student's research. The topic for the presentation should be cleared by the thesis supervisor.

4 Anthropology

Department of Anthropology
Stephen Leacock Building
855 Sherbrooke Street W., Room 717
Montreal, QC H3A 2T7
Canada

Telephone: (514) 398-4300

Fax: (514) 398-7476

Web site: www.arts.mcgill.ca/programs/anthro

Chair — Michael S. Bisson

4.1 Staff

Professors

Donald W. Attwood; A.B.(Calif.), Ph.D.(McG.)

Fumiko Ikawa-Smith; B.A.(Tsuda), A.M.(Radcliffe), Ph.D.(Harv.)

Margaret Lock; B.Sc.(Leeds), M.A., Ph.D.(Calif.) (*joint appoint. with Social Studies of Medicine*)

Jérôme Rousseau; M.A.(Montr.), Ph.D.(Cantab.)

Philip Carl Salzman; A.B.(Antioch), M.A., Ph.D.(Chic.)

Bruce G. Trigger; B.A.(Tor.), Ph.D.(Yale), F.R.S.C. (*James McGill Professor*) (*on leave Jan.-Dec. 2004*)

Allan Young; B.A.(Penn.), M.A.(Wash.), Ph.D.(Penn.) (*joint appoint. with Social Studies of Medicine*)

Associate Professors

Michael S. Bisson; B.A., M.A., Ph.D.(Calif.)

Laurel Bossen; B.A.(Barnard), M.A., Ph.D.(SUNY, Albany)

Ellen Corin; B.A., M.A., Ph.D.(Louvain) (*joint appoint. with Psychiatry*)

John Galaty; M.A., Ph.D.(Chic.)

Carmen Lambert; B.A.(Montr.), M.A., Ph.D.(McG.)

Kristin Norget; B.A.(Vic.,B.C.), M.Phil., D.

M.A. Degree in Medical Anthropology (48 credits)

The M.A. program in Medical Anthropology is given jointly by the Department of Anthropology and the Department of Social Studies of Medicine (SSOM). For additional information, including seminar offerings, please refer to the SSOM section.

The program is open to students with backgrounds in the social sciences, the medical professions, or the medical sciences. The M.A. degree is awarded by the Anthropology Department and admission is granted by a joint admissions committee made up of representatives from Anthropology and SSOM. Within the medical anthropology program, candidates will apply for permission to take one of the following courses of study:

a) M.A. with Thesis

This course of study is taken by students with an academic background in anthropology. Course and thesis requirements are the same as described in the M.A. in Anthropology, with thesis, with

● ANTH 611 RESEARCH DESIGN. (3)

ANTH 614 ECONOMIC ANTHROPOLOGY. (3)

ANTH 615 SEMINAR IN MEDICAL ANTHROPOLOGY. (3)

ANTH 616 POLITICAL ANTHROPOLOGY. (3)

ANTH 625 CULTURAL ECOLOGY. (3)

ANTH 631 SYMBOLIC ANTHROPOLOGY. (3)

ANTH 634 ANTHROPOLOGY OF DEVELOPMENT 1. (3)

ANTH 635 ANTHROPOLOGY OF DEVELOPMENT 2. (3)

ANTH 640 PSYCHOLOGICAL ANTHROPOLOGY. (3)

ANTH 648 STRUCTURAL ANTHROPOLOGY. (3)

ANTH 652 ANTHROPOLOGY AND GENDER. (3)

ANTH 660 RESEARCH METHODS. (3)

ANTH 665 QUANTITATIVE METHODS. (3)

ANTH 670 ARCHAEOLOGICAL THEORY 1. (3)

ANTH 671 ARCHAEOLOGICAL THEORY 2. (3)

ANTH 673 ARCHAEOLOGICAL FIELD METHODS. (3)

ANTH 676 ARCHAEOLOGICAL AREA. (3)

ANTH 678 ETHNOHISTORY. (3)

ANTH 680 TUTORIAL READING 1. (3)

ANTH 681 TUTORIAL READING 2. (3)

ANTH 682 TUTORIAL READING 3 (3)

ANTH 683 TUTORIAL READING 4. (3)

ANTH 684 TUTORIAL READING 5. (3)

ANTH 685 RESEARCH TUTORIAL 1. (3)

ANTH 686 RESEARCH TUTORIAL 2. (3)

ANTH 690 RESEARCH PAPER 1. (6)

ANTH 691 RESEARCH PAPER 2. (6)

ANTH 692 RESEARCH PAPER 3. (6)

ANTH 693 RESEARCH PAPER 4. (6)

ANTH 694 M.A. THESIS TUTORIAL 1. (6)

ANTH 695 M.A. THESIS TUTORIAL 2. (6)

ANTH 696 M.A. RESEARCH PAPER. (15)

ANTH 699 M.A. THESIS. (24)

May be offered as: ANTH 699D1 and ANTH 699D2.

ANTH 700D1 P12 340.4402 Tm-0.064(5.9(ANT)-5.9(H 699D2.)J8nT)-8 Tc(T)T 36 3102319.2602 Tm0.0(24)May be offered as:May be(6) ANTH 5(e)-.1 360

There are two areas of study in the post-professional M.Arch.II and Ph.D. programs: Architectural History and Theory, and Housing (which includes Affordable Homes, Domestic Environments, and Minimum Cost Housing).

Information concerning the duration of programs, documents required of applicants, etc., may be obtained from: profdegree.architecture@mcgill.ca (M.Arch.I), postprofmaster.architecture@mcgill.ca (M.Arch.II and Graduate Diploma in Housing), or phd.architecture@mcgill.ca (Ph.D.).

Architectural Certification in Canada

In Canada, all provincial associations recommend a degree from an accredited professional degree program as a prerequisite for licensure. The Canadian Architectural Certification Board (CACB), which is the sole agency authorized to accredit Canadian professional degree programs in architecture, recognizes two types of accredited degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards.

Masters degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.

Since all provincial associations in Canada recommend any applicant for licensure to have graduated from a CACB-accredited program, obtaining such a degree is an essential aspect of

M.Arch.I Program of Study (45 credits)

Unless otherwise indicated, the above courses are restricted to students in the professional program.

M.Arch.II

The post-professional Masters (M.Arch.II) is open to applicants who have a professional degree in architecture. Students holding the McGill B.Arch. (former) or M.Arch.I (new) degree, or an equivalent professional qualification, with a CGPA of at least 3.0 on a 4.0 point scale, are eligible for admission to the graduate programs. In special cases, applicants with a degree in a related field may be considered. The primary requirement for the M.Arch.II is 30 credits of course work, to be completed in the first two terms, and a 15-credit project report that can be completed during the summer, or in the following fall term. The residence requirement for the M.Arch.II degree is three academic terms, making it possible for students who elect to work on their project report in the summer term to obtain their degree after twelve calendar months in the program.

Ph.D.

Doctoral candidates must have their thesis proposal approved by their advisor (ARCH 700) before embarking on their research. A Thesis Advisory Committee is then struck and is responsible for monitoring the student's research. For course number ARCH 701, a comprehensive research proposal is required, as well as a demonstration of broad knowledge in the field. Candidates will submit two further reports in formal meetings with the Advisory Committee, who will review the work in progress (ARCH 702 and ARCH 703). The final meeting takes place after the Committee has reviewed the full draft of the dissertation. If approved, the dissertation will then be submitted in its final form to the Thesis Office. Acceptance of the thesis by the examiners is followed by an oral defense.

Graduate Diploma in Housing

The Graduate Diploma in Housing is open to applicants who have a professional degree in architecture. The Diploma program is a two-term program which is intended for professionals who have worked in the area of housing in North America or in the developing world. The program is designed for those who, while wishing

Urban Planning students) Theory and practice. An examination of different basic approaches to urban planning with special reference to Quebec.

ARCH 551 URBAN PLANNING 2. (3) (2-1-6) (Prerequisite: ARCH 550) Urban design and project development, theory and practice. Detailed analysis of selected exam

6 Art History

Department of Art History and Communication Studies
Arts Building, W-225 (West Wing, top floor)

Inquiries regarding the Programs should be addressed to the Graduate Administrative Coordinator, Department of Art History and Communication Studies.

McGill's on-line application form for graduate program candidates is available at www.mcgill.ca/applying/graduate.

Associate Professors

P. Bartello; B.Sc., M.Sc., Ph.D.(McG.) (*joint appoint. with Mathematics*)

J.R. Gyakum; B.Sc.(Penn.St.), M.Sc., Ph.D.(M.I.T.)

D. Straub; B.S., M.S.(SW Louisiana), Ph.D.(Wash.)

Assistant Professors

P. Ariya; B.Sc., Ph.D.(York) (*William Dawson Scholar*) (*joint appoint. with Chemistry*)

F. Fabry; B.Sc., M.Sc., Ph.D.(McG.) (*joint appoint. with McGill School of Environment*)

Adjunct Professors

G. Brunet, R.G. Ingram, R. Laprise, S. Laroche, A. Zadra

7.2 Programs Offered

The Department of Atmospheric and Oceanic Sciences offers courses and research opportunities in atmospheric, physical oceanographic, and climate fields leading to the M.Sc. and Ph.D. degrees. Research programs include the main areas of atmospheric science, such as cloud and precipitation physics, dynamic meteorology, numerical weather prediction, atmospheric chemistry, radar and satellite meteorology, and mesoscale meteorology. Research projects in physical oceanography include the modelling of ocean circulations as well as studies of sea ice and paleoclimates. Some faculty members are associated with the Centre for Climate and Global Change Research, which brings together researchers from several departments to work on problems affecting the evolution of our planet, with emphasis on climate-related questions. Topics of research of this nature in the Department include large scale air/sea interaction, air/sea-ice interaction, inter-annual and longer term variability of the atmosphere and oceans, and cloud-radiation climate interaction.

Other faculty members are associated with the Cooperative Centre for Research in Mesometeorology which also includes researchers in several other departments at McGill, in the Département de Physique at the Université du Québec à Montréal, and in Montreal offices of the Meteorological Service of Canada. The objective of the Centre is to study the evolution, maintenance and decay of mesoscale precipitation systems. Such systems, whose sizes range from 10 to 300 km, are important for the precipitation climatology of southern Quebec.

Facilities include the J. Stewart Marshall Radar Observatory, a radar wind profiler and a laser ceilometer and several years of globaltemp. te meteorol3.0007 Tcg tant chemis-(ogy,m778 compu)8(s,005 Tc our)0.0006(of the -7.3art Mar)6.6(s)-4.2(ha03os)-7.018NEC sup4(to)7compurobjec

Barotropic, baroclinic, symmetric, and Kelvin-Helmholtz instability. Wave-mean flow interaction. Equatorially trapped waves.

● **ATOC 515 TURBULENCE IN ATMOSPHERE AND OCEANS.** (3) (3 hours lectures)

ATOC 530 CLIMATE DYNAMICS 1. (3) (Fall) (3 hours lectures) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Introduction to the components of the climate system. Review of paleoclimates. Physical processes and models of climate and climate change.

ATOC 531 CLIMATE DYNAMICS 2. (3) (Winter) (3 hours lectures) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) The general circulation of the atmosphere and oceans. Atmospheric and oceanic general circulation models. Observations and models of the El Niño and Southern Oscillation phenomena.

ATOC 540 SYNOPTIC METEOROLOGY 1. (3) (Fall) (2 hours lectures; 2 hours laboratory) Analysis of current meteorological data. Description of a geostrophic, hydrostatic atmosphere. Ageos-AC

8 Biochemistry

Department of Biochemistry
McIntyre Medical Sciences Building
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Telephone:

Admissions Information (514) 398-7262

Student Affairs Officer (514) 398-7266

Fax: (514) 398-7384

E-mail: admissions.biochemistry@mcgill.ca

Web site: www.mcgill.ca/biochemistry

Chair — David Y. Thomas

8.1 Staff

Emeritus Professors

Angus F. Graham; M.Sc., Ph.D., D.Sc.(Edin.), F.R.S.C.

Rose M. Johnstone; B.Sc., Ph.D.(McG.), F.R.S.C.

Samuel Solomon; M.Sc., Ph.D.(McG.), F.R.S.C.

Theodore L. Sourkes; M.Sc.(McG.), Ph.D.(C'nell), F.R.S.C.

Professors

Rhoda Blostein; B.Sc., M.Sc., Ph.D.(McG.)

Nicole Beauchemin; B.Sc., M.Sc., Ph.D.(Montr.) (*joint appoint. with Oncology*)

Philip E. Branton; B.Sc., M.Sc., Ph.D.(Tor.) (*Gilman Cheney Professor of Biochemistry*)

Peter E. Braun; B.Sc., M.Sc.(Br.Col.), Ph.D.(Berk.)

Vincent Giguère; B.Sc., Ph.D.(Laval) (*joint appoint. with Oncology*)

Philippe Gros; B.Sc., M.Sc.(Montr.), Ph.D.(McG.) (*James McGill Professor*)

Annette A. Herscovics; B.Sc., M.Sc., Ph.D.(McG.), F.R.S.C. (*joint appoint. with Oncology*)

Robert E. MacKenzie; B.Sc.(Agr.) (McG.), M.N.S., Ph.D.(C'nell)

Edward A. Meighen; B.Sc.(Alta.), Ph.D.(Berk.)

Walter E. Mushynski; B.Sc., Ph.D.(McG.)

Morag Park; B.Sc., Ph.D.(Glas.) (*William Dawson Scholar*)

Jerry Pelletier; B.Sc., Ph.D.(McG.)

Gordon C. Shore; B.Sc.(Guelph), Ph.D.(McG.)

Joseph Shuster; B.Sc.(McG.), Ph.D.(Calif.), M.D.(Alta.)

John R. Silvius; B.Sc., Ph.D.(Alta.)

Nahum Sonenberg; M.Sc., Ph.D.(Weizmann Inst.) F.R.S.C. (*James McGill Professor*)

Clifford P. Stanners; B.Sc.(McM.), M.A., Ph.D.(Tor.) (*joint appoint. with Oncology*)

David Y. Thomas; B.Sc.(Bristol), M.Sc., Ph.D.(Univ. College, Lond.), F.R.S.C.

Michel L. Tremblay; B.Sc., M.Sc.(Sher.), Ph.D.(McM.)

Maria Zannis-Hadjopoulos; B.Sc., M.Sc., Ph.D.(McG.) (*joint appoint. with Oncology*)

Associate Professors

Albert Berghuis; B.Sc., M.Sc.(Rijks Univ. Groningen, The Netherlands), Ph.D.(UBC)

Kalle Gehring; M.Sc.(Mich.), Ph.D.(Berk.)

Alain Nepveu; B.Sc., M.Sc.(Montr.), Ph.D.(Sher.) (*joint appoint. with Oncology*)

Arnim Pause; B.Sc., M.Sc.(U. Konstanz, Germ.), Ph.D.(McG.)

Assistant Professor

Imed Gallouzi; Maîtrise, DEA, Ph.D.(Montpellier, France)

Associate Members

Karine Auclair (*Chemistry*), John J. Bergeron (*Anatomy and Cell Biology*), Katherine Cianflone (*Exp. Medicine, RVH*),

L. Ferdinand Congote (*Exp. Medicine, RVH*),

Mark S. Featherstone (*Oncology*), William C. Galley (*Chemistry*),

Michael Hallett (*Computer Science*), Peter J. Roughley (*Shriners' Hosp.*),

Erwin Schurr (*Exp. Medicine, RVH*), Charles Scriver (*Pediatrics, MCH*),

Bernard Turcotte (*Exp. Medicine, RVH*),

Simon Wing (*Medicine*), Xiang-Jiao Yang (*Mol. Oncol., RVH*)

Adjunct Professors

Prabhat Arya (*NRC, Steacie Inst. for Mol. Sciences*);

Michael Cordingley (*Boehringer-Ingelheim*); Mirek Cygler

(*NRC/BRI*); Jacques Drouin (*Clin. Res. Inst.*); Feng Ni (*NRC/BRI*);

Donald Nicholson (*Merck Frosst*); Maureen D. O'Connor-McCourt

(*NRC/BRI*); Enrico Purisima (*NRC/BRI*); Sophie Roy; (*Merck*

Frosst); Andrew C. Storer (*NRC/BRI*); Marc Therrien

(*Clin.Res.Inst.*); Alice Vrielink (U.Cal., Santa Cruz)

8.2 Programs Offered

The Department of Biochemistry offers training at both the M.Sc. and Ph.D. levels. There are a wide variety of areas in which specialized training for the Ph.D. can be obtained.

The Department concentrates on the following key areas of research: signal transduction; molecular genetics; gene regulation; oncogenes; structure, function and regulation of proteins; membrane structure, function and assembly; intracellular protein targeting; embryonic development; bioinformatics; chemical biology and cellular neurobiology. A summary of the research interest of faculty members is available on the Department's Website.

Funding

Prospective students are urged to make every effort to secure their own funding. All students accepted to the program must be financially supported either by their supervisor or through studentships or fellowships. Applications may be made for a variety of fellowships administered by the University or by various private, provincial or federal agencies. Deadlines for completion of most fellowship applications vary from October to February for studies beginning the following September. For more information on fellowships and awards, see the Graduate and Postdoctoral Studies Office Web site www.mcgill.ca/gps.

8.3 Admission Requirements

Admission is based on the candidate's academic record, letters of recommendation, curriculum vitae and personal statement. A minimum grade point average of 3.2/4.0 (B+) is required. Files that do not meet the minimum requirement will not be considered.

Master's Program

Candidates for the M.Sc. degree must hold a B.Sc. degree or its equivalent in Biochemistry or in related disciplines (e.g., biology, chemistry, physics, physiology, microbiology).

Doctoral Program

approach staff members during or before the application process since no students are accepted without a supervisor.

McGill's on-line application form for graduate program candidates is available at www.mcgill.ca/applying/graduate.

Deadlines

Applications should be submitted as early as possible in order to meet the following deadlines:

Canadian applicants: March 1 for September admission
July 1 for January admission

International applicants: November 1 for September admission
April 1 for January admission

8.5 Program Requirements

Coursework

All students are required to complete a minimum of 6 course credits as part of their M.Sc. or Ph.D. program. The Graduate Admissions Committee may stipulate additional course work depending on the background of the candidate. Unless stipulated on the decision form, students, after consultation with their research director and with the approval of the Chair of the Graduate Admissions Committee, may choose their courses from those offered by Biochemistry, Experimental Medicine, Biology, Chemistry, Physiology as well as other graduate and advanced undergraduate courses in the medical and allied sciences. The following courses are required for those who have not completed an equivalent: BIOC 450 Protein Structure and Function, and BIOC 454 Nucleic Acids.

Departmental Seminars: Members of the staff and visiting scientists present their work to the Department at weekly and bi-weekly intervals respectively throughout the academic year. Graduate students are required to attend all the above seminars and other informal seminars, and are encouraged to attend meetings of scientific communities.

Master's Program

The M.Sc. program is comprised of 45 credits:

Additional courses may be required, depending on the student's background.

The M.Sc. program usually requires a minimum of two years of study. Students in the M.Sc. program are required to complete all course requirements and submit a thesis.

Doctoral Program

The requirements for the doctorate are: successful completion of the minimum of 6 course credits specified above, **plus** any additional course work stipulated by the Graduate Admissions Committee; the comprehensive oral exams; submission of a thesis, and its oral defence.

Transfer to the Ph.D.

After 21 months students may transfer to the Ph.D. program only if all transfer requirements have been fulfilled. This includes completion of BIOC 701 **and** the minimum of 6 course credits specified above, **plus** any additional course work stipulated by the Graduate Admissions Committee. The M.Sc. thesis requirement is then waived.

Comprehensive Oral Exams

All students who plan to proceed to the Ph.D. degree, as well as students entering at the Ph.D. level, must present and pass the following comprehensive oral exams, listed as courses:

and magnetic resonance spectroscopy of biopolymers, and applications to biological systems.

BIOC 450 PROTEIN STRUCTURE AND FUNCTION. (3) (Fall) (Prerequisites: BIOC 311, BIOC 312 and/or sufficient organic chemistry. Intended primarily for students at the U3 level) Primary, secondary, tertiary and quaternary structure of enzymes. Active site mapping and site-specific mutagenesis of enzymes. Enzyme kinetics and mechanisms of catalysis. Multienzyme complexes.

BIOC 454 NUCLEIC ACIDS. (3) (Fall) (Prerequisites: BIOC 311, BIOC 312 or permission of instructor) Chemistry of RNA and DNA, transcription and splicing of RNA and their control; enzymology of DNA replication. Special topics on transgenics, genetic diseases and cancer.

BIOC 455 NEUROCHEMISTRY. (3) (Winter) (Prerequisites: BIOC 311, BIOC 312 or permission of instructor) Covers biochemical mechanisms underlying central nervous system function. Introduces basic neuroanatomy, CNS cell types and morphology, neuronal excitability, chemically mediated transmission, glial function. Biochemistry of specific neurotransmitters, endocrine effects on brain, brain energy metabolism and cerebral ischemia (stroke). With examples, where relevant, of biochemical processes disrupted in human CNS disease.

BIOC 458 MEMBRANES AND CELLULAR SIGNALING. (3) (Winter) (Prerequisites: BIOC 212, ANAT 262; one of PHGY 201, PHGY 209 or BIOL 205; one of BIOC 312 or ANAT 365; and BIOC 311 or permission of instructors) (This course is also listed as ANAT 458. Not open to students who have taken or are taking ANAT 458 or BIOC 456) An integrated treatment of the properties of biological membranes and of intracellular signaling, including the major role that membranes play in transducing and integrating cellular regulatory signals. Biological membrane organization and dynamics: membrane transport; membrane receptors and their associated effectors; mechanisms of regulation of cell growth, morphology, differentiation and death.

9 Bioethics

For information, write to:

Chair, Master's Specialization in Bioethics

Biomedical Ethics Unit

Argument forms include those drawn from diverse ethical theories and traditions.

BIOE 681 BIOETHICS PRACTICUM. (3) (Limited enrolment) Four hours per week supervised placement within health care settings

10.2 Programs Offered

The Department offers graduate training in many areas of biology with particular strengths in Molecular Genetics and Development, Evolutionary and Behavioural Ecology, Human Genetics, Limnology, Marine Biology, Neurobiology, and Experimental Plant Biology.

Graduate programs leading to the M.Sc. and Ph.D. degrees are offered. The emphasis in both programs is on development of the intellectual and technical skills necessary for independent research. The main component of both degrees is a thesis embodying the results of original research. Formal course requirements are few and are largely intended to fill gaps in the student's background.

The Stewart Biology Building is well equipped for graduate training and research in a wide variety of areas of biology. Its resources are greatly extended by affiliation with other organizations such as the Redpath Museum; the Groupe Interuniversitaire de Recherches Océanographiques du Québec (GIROQ); the Biotechnology Research Institute of the National Research Council of Canada; Macdonald Campus; the Montreal Neurological Institute; the Jewish General Hospital; the Montreal General, Montreal Children's and Royal Victoria Hospitals. Field research facilities include the Mont St. Hilaire Field Station (Quebec); the Huntsman Marine Science Centre (New Brunswick); the Subarctic Research Laboratory (Quebec); the Bellairs Research Institute (Barbados); and the Memphremagog Field Station (Quebec).

The Department specifies a minimum level of support for all graduate students. This amount is \$13,500 per annum plus tuition fees. The required minimum duration of support is two years for the M.Sc. program, five years for a Ph.D. student entering as Ph.D.1 (from a Bachelor's) and four years for a Ph.D. student entering as Ph.D.2.

10.3 Admission Requirements

Applicants must have a B.Sc. in a discipline relevant to the proposed field of study with an overall Cumulative Grade Point Average (CGPA) of 3.0/4.0 or a CG

Course Requirements – Students are required to take 6 course credits. These courses may be taken in Biology or in other departments and must be numbered 500 or higher. Additional courses may be required if the student's background is insufficient. A graduate pass (B- or better) is mandatory for all courses required for the Ph.D. degree.

Ph.D. Qualifying Examination – The Qualifying exam is a formal evaluation of the student's ability to proceed to the attainment of the Ph.D. Students must pass the Qualifying Examination (BIOL 700) no later than 15 months from the date of registration in the program. Students who transfer from the Master's program must take the exam within 8 months. Students who enter the Ph.D. program after completing an M.Sc. in Biology at McGill must take the exam within 12 months.

Ph.D. Seminar – All Ph.D. students must deliver a research seminar (BIOL 702) at some time during the academic session (September-April) towards the end of their studies and preferably at least 3 months prior to the thesis submission.

Thesis – The Ph.D. is a research degree. The candidate must present a thesis which represents high scholastic attainment in a specialized field, demonstrated by independent and original research. After the thesis has been submitted and approved, the candidate is required to orally defend their thesis in an open forum.

Ph.D. REQUIREMENTS – NEOTROPICAL ENVIRONMENT

Length of Program – Candidates entering Ph.D.1 must complete at least three years of full-time resident study (6 terms). The normal and expected duration of the Ph.D. program is 4-5 years. A student who has obtained a Master's degree at McGill, or at an approved institution elsewhere, and is proceeding in the same subject towards a Ph.D. degree may, upon the recommendation of the Graduate Training Committee, enter at the Ph.D.2 level.

Course Requirements – Students are required to take 6 course credits: ENVR 610 and BIOL 640. Three more credits must be chosen from POLI 644; SOCI 565, ENVR 611, ENVR 612, ENVR 680, BIOL 553, BIOL 641, GEOG 498, AGRI 550. Additional courses may be required if the student's background is insufficient. A graduate pass (B- or better) is mandatory for all courses required for the Ph.D. degree.

Participation in the MSE-Panama Symposium presentation in Montreal is also required.

Ph.D. Qualifying Examination – The Qualifying exam is a formal evaluation of the student's ability to proceed to the attainment of the Ph.D. Students must pass the Qualifying Examination (BIOL 700) no later than 15 months from the date of registration in the program. Students who transfer from the Master's program must take the exam within 8 months. Students who enter the Ph.D. program after completing an M.Sc. in Biology at McGill must take the exam within 12 months.

Ph.D. Seminar – All Ph.D. students must deliver a research seminar (BIOL 702) at some time during the academic session (September -April) towards the end of their studies and preferably at least 3 months prior to the thesis submission.

Thesis – The Ph.D. is a research degree. The candidate must present a thesis which represents high scholastic attainment in a specialized field, demonstrated by independent and original research. After the thesis has been submitted and approved, the candidate is required to orally defend their thesis in an open forum.

10.6 Courses

Students preparing to register should consult the Web at www.mcgill.ca/minerva (click on Class Schedule) for the most up-to-date list of courses available; courses may have been added, rescheduled or cancelled after this Calendar went to press. Class Schedule lists courses by term and includes days, times, locations, and names of instructors.

The course credit weight is given in parentheses after the title.

★ Denotes courses offered in alternate years.

● Denotes courses not offered in 2003-04.

GENERAL COURSES

BIOL 650 RECENT ADVANCES IN BIOLOGY 1. (3) Directed reading, seminar and discussion courses in subjects of current interest in biological research. Intended for students working individually or in classes on selected areas under the supervision of one or more staff members. Content and form are flexible to allow the Department to meet specific student demands or needs. Such courses are arranged by consultation with individual staff.

BIOL 651 RECENT ADVANCES IN BIOLOGY 2. (3) Directed reading, seminar and discussion courses in subjects of current interest in biological research. Intended for students working individually or in classes on selected areas under the supervision of one or more staff members. Content and form are flexible to allow the Department to meet specific student demands or needs. Such courses are arranged by consultation with individual staff.

BIOL 652 RECENT ADVANCES IN BIOLOGY 3. (3) Directed reading, seminar and discussion courses in subjects of current interest in biological research. Intended for students working individually or in classes on selected areas under the supervision of one or more staff members. Content and form are flexible to allow the Department to meet specific student demands or needs. Such courses are arranged by consultation with individual staff.

BIOL 655 LABORATORY PROJECTS AND TECHNIQUES 1. (3) biological

H.L. Galiana; B.Eng., M.Eng., Ph.D.(McG.) (*joint appoint. with Otolaryngology*)

R.E. Kearney; B.Eng., M.Eng., Ph.D.(McG.) (*joint appoint. with Physiology*)

Associate Professors

J.D. Bobyn; B.Sc., M.Sc.(McG.), Ph.D.(Tor.) (*joint appoint. with Surgery*)

W.R.J. Funnell; B.Eng., M.Eng., Ph.D.(McG.) (*joint appoint. with Otolaryngology*)

G.B. Pike; B.Eng., M.Eng., Ph.D.(McG.) (*joint appoint. with Neurology and Neurosurgery*)

BMDE 519 BIOMEDICAL SIGNALS AND SYSTEMS. (3) (2-0-8) (Prerequisites: Satisfactory standing in U3 Honours Physiology (Neurophysiology option); or U3 Major in Physics-Physiology; or permission of instructor.) An introduction to the theoretical framework, experimental techniques and analysis procedures available for the quantitative analysis of physiological systems and signals. Lectures plus laboratory work using the Biomedical Engineering computer system. Topics include: amplitude and frequency structure of signals, filtering, sampling, correlation functions, time and frequency-domain descriptions of systems.

BMDE 650 ADVANCED MEDICAL IMAGING. (3) (Prerequisite: MDPH 607) Review of advanced techniques in medical imaging including: fast magnetic resonance imaging (MRI), functional MRI, MR angiography and quantitative flow measurement, spiral and dynamic x-ray computed tomography, 2D/3D positron emission tomography (PET), basic PET physiology, tracer kinetics, surgical planning and guidance, functional and anatomical brain mapping, 2D and 3D ultrasound imaging, and medical image processing.

BMDE 690 THESIS RESEARCH 1. (3)

BMDE 691 THESIS RESEARCH 2. (3)

BMDE 692 THESIS RESEARCH 3. (3)

BMDE 693 THESIS RESEARCH 4. (6)

BMDE 694 THESIS RESEARCH 5. (6)

BMDE 695 THESIS SUBMISSION. (12)

BMDE 700 PH.D. COMPREHENSIVE. (0)

Related courses offered in other units include the following:

Computer Science

COMP 538 Person-Machine Communication (3)

COMP 540 Matrix Computations (3)

Electrical Engineering

ECSC 512 Digital Signal Processing 1 (3)

ECSC 523 Speech Communications (3)

ECSC 526 Artificial Intelligence (3)

ECSC 529 Image Processing and Communication (3)

ECSC 626 Computer Vision (4)

Mechanical Engineering

MECH 561 Biomechanics of Musculoskeletal Systems (3)

Physiology

PHGY 423 Physiological Dynamics (3)

PHGY 502 Exercise Physiology (3)

PHGY 517 Artificial Internal Organs (3)

PHGY 518 Artificial Cells (3)

For full course descriptions refer to appropriate Calendar entry.

Other courses can be found in related departments.

Applications will be considered upon receipt of a completed application form, \$60 application fee, all official transcripts, two signed original letters of reference on official letterhead of originating institution, and (if required) proof of competency in oral and written English by appropriate exams. DOCUMENTS SUBMITTED WILL NOT BE RETURNED.

Deadlines – Applications, including all supporting documents must reach the Student Affairs Office no later than June 1 (March 1 for International) for the *Fall Term (September)*; October 15 (July 1 for International) for the *Winter Term (January)*; February 15 (November 1 for International) for the *Summer Term (May)*. It may be necessary to delay review of the applicant's file until the following admittance period if application materials including supporting documents are received after these dates. International applicants are advised to apply well in advance of the deadline because immigration procedures may be lengthy. Applicants are encouraged to make use of the on-line application form available on the Web at www.mcgill.ca/applying/graduate.

Application Fee (non-refundable) – A fee of \$60 Canadian must accompany each application (including McGill students), otherwise it cannot be considered. This sum must be remitted using one of the following methods:

1. Credit card (by completing the appropriate section of the application form). NB: on-line applications must be paid for by credit card.
2. **Certified** cheque in Cdn.\$ drawn on a Canadian bank.
3. **Certified** cheque in U.S.\$ drawn on a U.S. bank.
4. Canadian Money order in Cdn.\$.
5. U.S. Money Order in U.S.\$.
6. An international draft in Canadian funds drawn on a Canadian bank requested from the applicant's bank in his/her own country.

Transcripts – Two official copies of all transcripts with proof of degree(s) granted are required for admission. Transcripts written in a language other than English or French must be accompanied by a certified translation. An explanation of the grading system used by the applicant's university is essential. It is the applicant's responsibility to arrange for transcripts to be sent.

It is desirable to submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only. Applicants must be graduates of a university of recognized reputation and hold a Bachelor's degree equivalent to a McGill Honours degree in a subject closely related to the one selected for graduate work. This implies that about one-third of all undergraduate courses should have been devoted to the subject itself and another third to cognate subjects.

Letters of Recommendation – Two letters of recommendation *on letterhead (official paper) or bearing the university seal* and with original signatures from two instructors familiar with the applicant's work, preferably in the applicant's area of specialization, are required. It is the applicant's responsibility to arrange for these letters to be sent.

Competency in English – Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by appropriate exams, e.g., TOEFL (minimum score 550 on the paper-based test or 213 on the computer-based test) or IELTS (minimum overall band 6.5). The MCHE is not considered equivalent. Results must be submitted as part of the application. The University code is 0935 (McGill University, Montreal); please use department code 31 (graduate schools), Biological Sciences - Agriculture to ensure that your TOEFL reaches this Office without delay.

Graduate Record Exam (GRE) – The GRE is not required, but it is highly recommended.

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

● ★ **ABEN 530 FERMENTATION ENGINEERING.** (3) (3 lectures and one 3-hour lab)

ABEN 608 SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING. (3) (2 conferences, either term) Laboratory, field and library studies and reports on special problems related to agricultural and biosystems engineering that are not covered in regular course work.

● **ABEN 611 ADVANCES IN IRRIGATION ENGINEERING.** (3) (3 hours lectures)

ABEN 612 SIMULATION AND MODELLING. (3) (3 lectures) Modeling, physical and virtual models of linear, chaotic and stochastic systems, simulation techniques and methods for static and dynamic models, steady and unsteady state. Examples from various areas such as machine design, population dynamics, food processing, biological control, farm management, ecological system design. Mathematics and computer oriented - students must be familiar with microcomputer operation.

● **ABEN 616 ADVANCED SOIL AND WATER ENGINEERING.** (3) (3 lectures)

● **ABEN 621 ADVANCES IN POST-HARVEST TECHNOLOGY - DRYING.** (3) (3 hours lectures)

● **ABEN 622 ADVANCES IN POST-HARVEST TECHNOLOGY -**

oriented degree requiring a limited number of courses and a research thesis; the M.Eng. (Project) is a course-oriented degree which includes a project. Three specialized versions of the M.Eng. (Project) are offered: specialization in pulp and paper; specialization in petrochemicals, polymers and plastics; specialization in environmental engineering.

The M.Sc. degree is appropriate

J.F. Harrod; B.Sc., Ph.D.(Birm.)
A.S. Hay; B.Sc.(Alta.), Ph.D.(Ill.), F.R.S.
M. Onyszchuk; B.Sc.(McG.), M.Sc.(W.Ont.), Ph.D.(Cantab),
Ph.D.(McG.), F.C.I.C.
D. Patterson; M.Sc.(McG.)
A.S. Perlin; M.Sc., Ph.D.(McG.), F.C.I.C., F.R.S.C.
W.C. Purdy; B.A.(Amh.), Ph.D.(M.I.T.), F.C.I.C.
L.E. St-Pierre; B.Sc.(Alta.), Ph.D.(Notre Dame), F.C.I.C.
M.A. Whitehead; B.Sc., Ph.D., D.Sc.(Lond.), F.C.I.C.

Professors

D.S. Bohle; B.A.(Reed College), M.Phil., Ph.D.(Auck.)
I.S. Butler; B.Sc., Ph.D.(Brist.), F.C.I.C.
T.H. Chan; B.Sc.(Tor.), M.A., Ph.D.(Prin.), F.C.I.C., F.R.S.C.
M. Damha; B.Sc., Ph.D.(McG.)
A. Eisenberg; B.S.(Wor. Poly.), M.A., Ph.D.(Prin.), F.C.I.C.
P.G. Farrell; B.Sc., Ph.D., D.Sc.(Ex.)
D.F.R. Gilson; B.Sc.(Lond.), M.

14.4 Application Procedures

All inquiries concerning graduate work in the Department should be addressed to the Director of Graduate Studies, Department of Chemistry.

FINANCIAL ASSISTANCE

M.Sc. and Ph.D. Degrees

Financial assistance for accepted graduate students who do not hold fellowships or scholarships is normally available in the form of laboratory demonstratorships/assistantships, and occasionally by payment from research funds. Graduate students devote 12 hours per week (contact hours, plus grading of reports, etc.) during the academic session to their teaching duties. Financial assistance during the remainder of the year is provided from research funds. Most students receive partial fee waivers. Scholarship holders, such as NSERC or awards of similar value, receive a tuition fee waiver.

M.Sc. (Applied) Degree

Financial assistance for candidates in the M.Sc. (Applied) program is not available during the two academic sessions when courses are taken, unless candidates are recipients of scholar-

CHEM 552 PHYSICAL ORGANIC CHEMISTRY. (3) (Fall) (Prerequisite: CHEM 302) The correlation of theory with physical measurements on organic systems; an introduction to photochemistry; solvent and substituent effects on organic reaction rates, etc.; reaction mechanisms.

CHEM 555 NMR SPECTROSCOPY. (3) (Fall) (3 lectures) (Prerequisite: CHEM 355 or equivalent) Interpretation of proton and carbon-13 nuclear magnetic resonance spectroscopy in one dimension for structural identification.

CHEM 556 ADVANCED QUANTUM MECHANICS. (3) (Fall) (3 lectures) (Prerequisites: CHEM 345 and PHYS 242) Quantum mechanical treatment of species of chemical interest. Introduction to perturbation theory, both time-dependent and time-independent. Treatment of the variational principle. Introduction to atomic spectra. Chemical bonding in terms of both the valence bond and molecular orbital theory. Elementary collision theory. Interaction of radiation with molecules.

CHEM 567 CHEMOMETRICS: DATA ANALYSIS. (3) (Winter) (2 lectures and 3 hours of laboratory) (Prerequisite: Linear Algebra and experience in some computer programming language) Topics covered include; factorial analysis of chemical spectra, pattern recognition from multisensor data, linear and nonlinear optimization for the determination of optimal reaction conditions molecular modeling, multisensor calibration, etc.

CHEM 571 POLYMER SYNTHESIS. (3) (Winter) (3 lectures) (Prerequisite: CHEM 302 or equivalent, or permission of instructor.) A survey of polymer preparation and characterization; mechanisms of chain growth, including free radical, cationic, anionic, condensation and transition metal-mediated polymerization, and the effects of these mechanisms on polymer architecture; preparation of alternating, block, graft and stereoblock copolymers; novel macromolecular structures including dendrimers and other nanostructures.

● **CHEM 572 SYNTHETIC ORGANIC CHEMISTRY.** (3) (3 lectures) (Prerequisite: CHEM 382)

CHEM 575 CHEMICAL KINETICS. (3) (Winter) (3 lectures) (Prerequisites: CHEM 273 and CHEM 213) Kinetic laws, measurement of reaction rates, transition state and collision theory. Elementary reactions in gas, solution and solid phases and on surfaces. Reaction mechanisms, laser techniques, molecular beams, chemiluminescence, explosions. Extensive use of computers to simulate the kinetic behaviour of chemical systems.

● **CHEM 576 QUANTUM CHEMISTRY.** (3) (Lecture and/or reading course) (Prerequisite: CHEM 345)

● **CHEM 577 ELECTROANALYTICAL CHEMISTRY.** (3) (Prerequisites: CHEM 367 and CHEM 377)

● **CHEM 581 INORGANIC TOPICS 1.** (3) (Winter) (Prerequisite: CHEM 381)

CHEM 585 COLLOID CHEMISTRY. (3) (Winter) (Prerequisites: CHEM 273 and CHEM 345, MATH 223 and MATH 315, PHYS 241 and PHYS 242 or permission of instructor) Principles of the physical chemistry of phase boundaries. Electrical double layer theory; van der Waals forces; Brownian motion; kinetics of coagulation; electrokinetics; light scattering; solid/liquid interactions; adsorption; surfactants; hydrodynamic interactions; rheology of dispersions.

● **CHEM 587 TOPICS IN MODERN ANALYTICAL CHEMISTRY.** (3) (Fall) (Prerequisites: CHEM 367 and CHEM 377)

CHEM 591 BIOINORGANIC CHEMISTRY. (3) (Winter) (3 hours) (Prerequisite: CHEM 381) (For Honours and Major Chemistry students or with permission) The roles of transition and main group elements in biology and medicine will be examined with an emphasis on using tools for structure and genome searching as well as becoming acquainted with experimental spectroscopic methods useful for bioinorganic chemistry such as macromolecular X-ray diffraction, EPR and EXAFS.

CHEM 593 STATISTICAL MECHANICS. (3) (Winter) (2 lectures) (Research project) (Prerequisite: CHEM 345. Recommended: CHEM 355) Basic hypotheses of statistical thermodynamics; ideal

monatomic, diatomic and polyatomic gases; Einstein and Debye models of solids; statistical theory of black-body radiation; Debye-Hückel theory of electrolyte solutions; absolute reaction rate theory of rate processes; theories of solutions.

CHEM 597 ANALYTICAL SPECTROSCOPY. (3) (Fall) (2 lectures; 3 hours lab) (Prerequisites: CHEM 367 and CHEM 377) The design and analytical use of spectroscopic instrumentation with respect to fundamental and practical limitations. Classical emission, fluorescence, absorption and chemical luminescence. Topics may include photo-acoustic spectroscopy, multielement analysis, X-ray fluorescence and modern multiwavelength detector systems.

● **CHEM 603 INFRARED AND RAMAN SPECTROSCOPY.** (5)

CHEM 611 INORGANIC TOPICS 2. (4) This advanced level course surveys recent trends in inorganic chemistry. Students select a topic from the current literature, research the topic, present periodic oral reports and a final summary paper. The instructor participates as a tutor and gives occasional oral presentations on topics of his choice.

CHEM 612 ORGANOMETALLIC CHEMISTRY. (5) A first course at the graduate level in organometallic chemistry. The theory and practice of the field is treated starting from basic principles of inorganic and organic chemistry.

● **CHEM 619 ADVANCED ATMOSPHERIC CHEMISTRY.** (4)

● **CHEM 621 RECENT ADVANCES IN ORGANIC CHEMISTRY.** (5)

● **CHEM 623 STEREOCHEMISTRY.** (5)

● **CHEM 626D1 FUNDAMENTALS OF MEDICINAL CHEMISTRY.** (2)

● **CHEM 626D2 FUNDAMENTALS OF MEDICINAL CHEMISTRY.** (2)

● **CHEM 627 SPECIAL TOPICS 2.** (5)

CHEM 629 ORGANIC SYNTHESIS. (5) An advanced course in the synthesis of organic molecules with an emphasis on stereoselective transformations. Topics will include multiple bond formation, functional group interconversions, carbon-carbon bond formation and stereoselective oxidations and reductions.

CHEM 631D1 SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2) (Students must also register for CHEM 631D2) (No credit will be given for this course unless both CHEM 631D1 and CHEM 631D2 are successfully completed in consecutive terms) A directed reading course with individual student-professor conferences, and intended mainly for students specializing in analytical chemistry. Topics are chosen to meet the individual needs of each student.

CHEM 631D2 SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2) (Prerequisite: CHEM 631D1) (No credit will be given for this course unless both CHEM 631D1 and CHEM 631D2 are successfully completed in consecutive terms)

● **CHEM 634 SEMINAR IN ADVANCED MATERIALS.** (3)

CHEM 636 LABORATORY AUTOMATION 2. (5) (Prerequisite: CHEM

with McGill Chemical Society will provide exposure to a broad range of special topics within the discipline.

CHEM 655 ADVANCED NMR SPECTROSCOPY. (4) (1 lecture) (Pre-requisite: CHEM 555 or equivalent.) Advanced techniques of nuclear magnetic resonance spectroscopy, Fourier transform

Adjunct Professors

S. Babarutsi, J.P. Desmarais, S. Guiot, J. Hadjinicolaou, J. Hawari, P. Henshaw, G. Holder, E. Lecolletier, Z. Lounis, K. MacKenzie, C. Manatakos, T.S. Nguyen, P. Rodrigue, S. Scola, W. Taylor, J. Vrana, M. Wagner, A. Zaki, R. Zaloum

15.2 Programs Offered

Advanced courses of instruction and laboratory facilities are available for engineering graduate students desiring to proceed to the degrees of M.Eng., M.Sc. and Ph.D.

Graduate studies and research are at present being conducted in the fields of structures and structural mechanics, rehabilitation, fluid mechanics and hydraulics, materials engineering, soil behaviour, soil mechanics and foundations, water resources engineering, environmental engineering and transportation engineering.

Prerequisite

(Not credited to the Master Environmental Engineering Option Program) CIVE 225 Environmental Engineering or equivalent environmental engineering courses.

A. Required Core Courses

CHEE 591 Environmental Bioremediation
CIVE 555 Environmental Data Analysis
or AEMA 611 Experimental Designs
CIVE 615 Environmental Engineering
OCCH 612 Principles of Toxicology
or FDSC 505 Health Risks of Toxicants

B. Elective Engineering Courses

These are to be chosen from a list of specific courses offered by the following Engineering Departments:

Bioresource Engineering
Chemical Engineering
Civil Engineering and Applied Mechanics
Mechanical Engineering
Mining, Metals and Materials Engineering

C. Elective Non-engineering Courses

These are to be chosen from a list of specific courses offered by the following units:

Faculty of Agricultural and Environmental Sciences
Department of Atmospheric and Ocean Sciences
Department of Biology
Department of Chemistry
Department of Earth and Planetary Sciences
Department of Economics
McGill School of Environment
Department of Epidemiology and Biostatistics
Department of Geography
Faculty of Law
Faculty of Management
Department of Occupational Health
Department of Political Science
Faculty of Religious Studies
Department of Sociology
School of Urban Planning

The Environmental Engineering Option Program is administered by the Faculty of Engineering. Further information may be obtained from the Program Coordinator, Department of Civil Engineering and Applied Mechanics.

M.Eng. (Project) Degree

engineering materials; ferrous alloys, treatments, welding, special steels, cast iron; ceramic materials; polymers; composite materials; concrete, admixtures, structure, creep, shrinkage; asphalt and asphaltic materials; clay materials and bricks; impact of environment on material response, durability, quality assessment and control, industrial specifications; recent advances.

CIVE 514 STRUCTURAL MECHANICS. (3) (3-1-5) Stress, strain, and basic equations of linear elasticity. General and particular solutions of plane and axisymmetric problems. Stress concentration and failure criteria. Unsymmetrical bending of beams; shear centres; torsion of thin-walled structural members. Curved beams. Formulation and applications of energy principles, and their connection to finite-element method.

● **CIVE 526 SOLID WASTE MANAGEMENT.** (3) (3-2-4) (Prerequisite: CIVE 225)

CIVE 527 RENOVATION AND PRESERVATION: INFRASTRUCTURE. (3) (3-2-4) Maintenance, rehabilitation, renovation and preservation of infrastructure; infrastructure degradation mechanisms; mechanical, chemical and biological degradation; corrosion of steel; condition surveys and evaluation of buildings and bridges; repair and

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17 Communication Sciences and Disorders

School of Communication Sciences and Disorders
Beatty Hall

psychology and linguistics (with a minimum of six credits in each discipline). Knowledge of physiology is also desirable.

M.Sc. in Communication Sciences and Disorders

The M.Sc. provides research training for:

1. students who are also taking courses for professional qualification;
2. students who have a non-thesis professional degree in Communication Sciences and Disorders; and
3. students with degrees in related fields who wish to do research but not obtain professional qualification in Communication Sciences and Disorders.

Ph.D. in Communication Sciences and Disorders

Applicants should normally have a Master's degree with thesis or its equivalent in Communication Sciences and Disorders or a related field (e.g., psychology, linguistics).

Students who possess an appropriate Bachelor's degree or Master's degree without thesis will also be considered for the Ph.D. program, but, if admitted, must first complete a qualifying year of coursework and a research project in the School ("fast-track" option).

17.4 Application Procedures

McGill's on-line application form for graduate program candidates is available at www.mcgill.ca/applying/graduate.

Complementary Courses (21 credits)

academic achievement and evidence of talent and strong motivation in communication studies.

18.4 Application Procedures

Applications will be considered upon receipt of:

1. Completed and signed application form.
2. A non-refundable application fee of \$60 Canadian must accompany each application (including McGill students), otherwise it cannot be considered. This sum must be remitted using one of the following methods:
 - a. Credit card (by completing the appropriate section of the application form).
 - b. Certified cheque in Cdn. currency drawn on a Canadian bank.
 - c. Certified cheque in U.S. currency drawn on a U.S. bank.
 - d. Canadian Money Order in Cdn. currency.
 - e. U.S. Money Order in U.S. currency.
 - f. An international draft in Canadian funds drawn on a Canadian bank requested from the applicant's bank in his/her own country.
3. Two official copies of all transcripts are required for admission. Transcripts written in a language other than English or French must be accompanied by a certified translation. An explanation of the grading system used by the applicant's university is essential. It is the applicant's responsibility to arrange for transcripts to be sent. Documents submitted will not be returned. It is desirable to submit a list of the titles of courses taken in the major subject, since transcripts often give code numbers only.
4. Two letters of recommendation on letterhead or bearing the university seal and with original signatures from two instructors familiar with the applicant's work, preferable in the applicant's area of specialization, are required. It is the applicant's responsibility to arrange for these letters to be sent.
5. Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language are required to submit documented proof of competency in oral and written English, by completing the TOEFL exams (minimum score 550 on the paper-based test or 213 on the computer-based test). Results must be submitted as part of the application.
6. Statement of interest of at least 500 words addressing the

ENGC 637 CULTURAL ANALYSIS IN HISTORY. (3) Further analysis of cultural products, policy, history and the role of cultural institutions in the development of media practices.

ENGC 639 INTERPRETIVE METHODS IN MEDIA. (3) A study of the various modes of interpreting and understanding the products of the mass media and of other human communication events.

● **ENGC 643 NARROWCAST MEDIA.** (3)

● **ENGC 646 POPULAR MEDIA.** (3)

● **ENGC 649 AUDIENCE ANALYSIS.** (3)

ENGC 692 M.A. THESIS PREPARATION 1. (6)

May be offered as: **ENGC 692D1** and **ENGC 692D2**,
or **ENGC 692N1** and **ENGC 692N2**.

ENGC 693 M.A. THESIS PREPARATION 2. (6)

May be offered as: **ENGC 693D1** and **ENGC 693D2**,
or **ENGC 693N1** and **ENGC 693N2**.

ENGC 694 M.A. THESIS PREPARATION 3. (6)

May be offered as: **ENGC 694D1** and **ENGC 694D2**,
or **ENGC 694N1** and **ENGC 694N2**.

ENGC 695 M.A. THESIS PREPARATION 4. (6)

May be offered as: **ENGC 695D1** and **ENGC 695D2**,
or **ENGC 695N1** and **ENGC 695N2**.

ENGC 696 RESEARCH PROJECT 1. (6)

● **ENGC 697 RESEARCH PROJECT 2.** (6)

ENGC 702 COMPREHENSIVE EXAMINATION PART 1. (6) A required

COMP 520 COMPILER DESIGN. (4) (Fall) (3 hours, 1 hour consultation) (Prerequisites: COMP 273 and COMP 302) The structure of a compiler. Lexical analysis. Parsing techniques. Syntax directed translation. Run-time implementation of various programming language constructs. Introduction to code generation for an idealized machine. Students will implement parts of a compiler.

COMP 522 MODELLING AND SIMULATION. (4) (Fall) (3 hours) (Prerequisites: COMP 251, COMP 302, COMP 350) Simulation and modeling processes, state automata, Petri Nets, state charts, discrete event systems, continuous-time models, hybrid models, system dynamics and object-oriented modeling.



heaps, disjoint set structures, and splay trees. Amortizing. String algorithms. Huffman trees and suffix trees. Graph algorithms.

COMP 612 DATABASE SYSTEMS. (4) (3 hours) Database programming using the relational algebra. Introduces the relational model of databases and high level programming techniques with applications to data processing, text and picture processing, knowledge bases and logic programming on secondary storage.

COMP 617 INFORMATION SYSTEMS. (4) (3 hours) (Prerequisite: COMP 612) Seminar course. A major area of application of the techniques covered in 308-612 is discussed. No prior expertise in the application area is required, since the emphasis of the course is on methods of computation. Storage structures and algorithms for efficient retrieval and processing of data for the application will be discussed.

● **COMP 621 OPTIMIZING COMPILERS.** (4) (3 hours) (Prerequisite: COMP 251 or equivalent, COMP 302 or equivalent, COMP 520 is useful but not strictly necessary)

COMP 623 CONCURRENT PROGRAMMING LANGUAGES. (4) (3 hours) (Prerequisite: COMP 302 or equivalent.) The course will include the following topics: deadlock, fairness, liveness and safety properties, distributed protocols, standard concurrent programming problems, a comparative study of concurrent programming paradigms. Additional topics: dataflow programming, concurrent constraint programming, concurrent logic programming, process algebra, fault tolerant distributed systems, parallel object-oriented languages.

● **COMP 627 THEORETICAL PROGRAMMING LANGUAGES.** (4) (3 hours) (Prerequisites: COMP 524 and COMP 530)

● **COMP 631 SOFTWARE PROCESSING ENGINEERING.** (4) (3 hours) (Prerequisite: COMP 434)

COMP 642 NUMERICAL ESTIMATION. (4) (4 hours) (Prerequisites: MATH 323, MATH 324 and COMP 350) (Corequisite: COMP 540) Efficient and reliable numerical algorithms in estimation and their applications. Linear models and least squares estimation. Maximum-likelihood estimation. Kalman filtering. Adaptive estimation, GPS measurements and mathematical models for positioning. Position estimation. Fault detection and exclusion.

COMP 644 PATTERN RECOGNITION. (4) (3 hours) Techniques for smoothing, approximating and enhancing spatial and temporal data. Feature extraction and shape measurement using spatial moments and medial axis transforms. Detecting structure using Hough transforms and proximity graphs. Discriminant functions. Neural networks. Bayesian decision theory. Feature selection. Estimation of misclassification. Nearest neighbor decision rules. Applications.

COMP 646 COMPUTATIONAL r1 0 T5556 0 TD-0.0055.23,-0.000an.1 1596 8341.18COMP 646 C

Associate Professors

P.J. Allison; B.D.S., F.D.S.R.C.S., M.Sc.(Lond.), Ph.D.(McG.)
G. Bennett; B.A.(Rutge

Other complementary courses in the University may be taken with the approval of the supervisor or research director.

Thesis Research Courses (24 – 30 credits)

The required number of Master's thesis credits (minimum 24) will be made up from among the following:

M.SC. IN DENTAL SCIENCE, OPTION IN ORAL AND MAXILLOFACIAL SURGERY (46 credits)

Duration: Four calendar years commencing July 1.

Students will register in the four-year graduate-training program, which leads to a McGill Certificate of Residency Training. They will concurrently register with the Graduate and Postdoctoral Studies Office during the Third and Fourth years of the program and complete the requirements for the M.Sc. degree during these two years.

Required Courses (16 credits)

Thesis Component – Required (30 credits)

22 Dietetics and Human Nutrition

School of Dietetics and Human Nutrition
Room MS2-039, Macdonald-Stewart Building
Macdonald Campus, McGill University
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, QC H9X 3V9
Canada

Telephone: (514) 398-7762

Fax: (514) 398-7739

E-mail: lise.grant@mcgill.ca

Web site: www.mcgill.ca/dietetics

Director — Katherine Gray-Donald

22.1 Staff

Emeritus Professor

Helen Neilson; B.H.S., M.Sc.(McG.)

Professors

Tim A. Johns; B.Sc.(McM.), M.Sc.(Br.Col.), Ph.D.(Mich.) (*joint appoint. with Plant Science*)

Peter J.H. Jones; B.Sc., M.Sc.(Br.Col.), Ph.D.(Tor.)

Harriet V. Kühnlein; B.S.(Penn. St.), M.S.(Oregon St.),
Ph.D.(Calif.) (*joint appoint. with Faculty of Medicine*)

Associate Professors

Laurie H.M. Chan; B.Sc., M.Sc.(Hong Kong), Ph.D.(Lond.) (*joint*

(March 1 for International) for the *Fall Term (September)*;
October 15 (July 1 for International) for the *Winter Term (January)*;
February 15 (November 1 for International) for the *Summer Term (May)*.
It may be necessary to delay review of the applicant's file until the following admittance period if application materials including supporting documents are received after these dates. International applicants are advised to apply well in advance of the deadline because immigration procedures may be lengthy. Applicants are encouraged to make use of the on-line application form available on the Web at www.mcgill.ca/applying/graduate.

tion. The physiological basis for activity and the assessment of toxicity will be presented. Current practices relating to the regulation, commercialization and promotion of herbs and phytochemicals will be considered.

★ **NUTR 600 ADVANCED CLINICAL NUTRITION 1.** (3) (3 lectures) (Prerequisites: Courses in human nutrition, biochemistry and physiology and permission of instructor.) Application of nutrition knowledge in the therapy and support of humans in various physiological and pathological states. The etiology, biochemistry and pathology of various medical disorders; their nutritional assessment and treatment.

● ★ **NUTR 601 ADVANCED CLINICAL NUTRITION 2.** (3) (3 lectures) (Prerequisites: NUTR 377, NUTR 344, NUTR 445 or equivalent and permission of instructor.)

● ★ **NUTR 602 NUTRITIONAL - STATUS ASSESSMENT.** (3) (1 lecture and 1 lab) (Prerequisites: courses in human nutrition, biochemistry and physiology.)

★ **NUTR 603 NUTRITIONAL TOXICOLOGY.** (3) (Prerequisites: courses in human nutrition, biochemistry and physiology.) Combined lectures and tutorials cover topics in: mechanisms of nutrient modulation of xenobiotic toxicities; effects of nutrient excess and malnutrition on drug metabolism and toxicity; biogeography and hazards of environmental contaminants and food toxins; and nutrient effects on teratogenesis and carcinogenesis.

★ **NUTR 604 INTEGRATED METABOLIC RESEARCH.** (3) (2 seminars and 1 lab visit) (Prerequisites: at least one 500 or 600-level course in nutritional biochemistry, e.g. ANSC 551, ANSC 552, ANSC 634, and permission of instructor.)

NUTR 606 HUMAN NUTRITION RESEARCH METHODS. (3) (3 lectures) (Prerequisites: A graduate course in statistics or permission of the instructor.) Basic approaches, philosophy and techniques used in nutrition research with human population groups. The course will include the formation and criticism of

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possible. There are no special forms required to apply for financial aid from the Department, as all applicants will be considered for the awards for which they are eligible.

Candidates should indicate their field(s) of interest when making formal application for admission. Specific inquiries concerning the Department should be addressed to Graduate Admissions, Department of Earth and Planetary Sciences.

McGill's on-line application form for graduate program candidates is available at www.mcgill.ca/applying/graduate.

23.5 Program Requirements

M.Sc. Degree (45 credits)

The M.Sc. degree program includes:

- a) 12 credits from formal graduate courses to be chosen with the approval of the research director and Director of Graduate Studies and
- b) a thesis (33 credits) to be submitted according to the regulations of the Graduate and Postdoctoral Studies Office and the Department.

Ph.D. Degree

The Ph.D. degree program comprises:

- a) an approved program of courses selected in consultation with the student's academic adviser, and approved by the Academic Standing Committee,
- b) a Comprehensive oral examination at the end of the Ph.D.II, and
- c) research leading to a Ph.D. thesis followed by an oral defense.

Highly qualified B.Sc. graduates may be admitted directly to the Ph.D.I year. Students with the M.Sc. degree may be admitted to either the Ph.D.I or Ph.D.II year, depending on their background. Students are required to take 18 credits of graduate course study in the Ph.D.I year, and 6 credits plus a comprehensive oral examination in the Ph.D.II year. There is no language requirement for the Ph.D. degree.

23.6 Graduate Courses

Students preparing to register should consult the Web at www.mcgill.ca/minerva (click on Class Schedule) for the most up-to-date list of courses available; courses may have been added, rescheduled or cancelled after this Calendar went to press. Class Schedule lists courses by term and includes days, times, locations, and names of instructors.

provinces with a focus on processes and the origin of terrestrial magmas in upper-mantle source regions.

EPSC 613 REGIONAL STRUCTURAL ANALYSIS. (3) (2 hours lectures, 2 hours lab) Interpretation of structural measurements in complexly-deformed rocks. Regional geometric, kinematic and tectonic analysis.

● **EPSC 631 FIELD STUDIES - OROGENIC BELTS.** (3)

● **EPSC 631D1 FIELD STUDIES - OROGENIC BELTS.** (1.5) (2-week field course in May, plus assigned papers)

● **EPSC 631D2 FIELD STUDIES - OROGENIC BELTS.** (1.5)

EPSC 644 TOPICS - ADVANCED EARTH SCIENCES 1. (3) (3 hours lectures or seminars) A survey of a research topic of particular current interest.

EPSC 645 TOPICS - ADVANCED EARTH SCIENCES 2. (3) (3 hours lectures or seminars) A survey of a research topic of particular current interest.

● **EPSC 655 ALTERATION LITHOGEOCHEMISTRY.** (3) (2 hours lecture, 3 hours lab)

EPSC 697 THESIS PREPARATION 1. (9) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.

**May be offered as: EPSC 697D1 and EPSC 697D2,
or EPSC 697N1 and EPSC 697N2.**

EPSC 698 THESIS PREPARATION 2. (12) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.

**May be offered as: EPSC 698D1 and EPSC 698D2,
or EPSC 698N1 and EPSC 698N2.**

EPSC 699 THESIS PREPARATION 3. (12) Independent study, theoretical and/or laboratory work in connection with the development of an M.Sc. thesis. Success in the course is dependent on presentation of an adequate progress report to the supervisory committee.

**May be offered as: EPSC 699D1 and EPSC 699D2,
or EPSC 699N1 and EPSC 699N2.**

EPSC 700 PRELIMINARY DOCTORAL EXAMINATION. (0)

May be offered as: EPSC 700D1 and EPSC 700D2.

● **EPSC 706 ADVANCED SEDIMENTOLOGY.** (6) (2 hours lectures or seminar and 3 hours lab)

● **EPSC 706D1 ADVANCED SEDIMENTOLOGY.** (3)

● **EPSC 706D2 ADVANCED SEDIMENTOLOGY.** (3)

● **EPSC 710 GEOTECTONICS.** (3) (2 hours lectures or seminars)

EPSC 715 INSTRUMENTAL ANALYSIS. (3)

24.4 Application Procedures

Applications will be considered upon receipt of:

1. application form;
2. two copies of official transcripts sent by the university;
3. two letters of reference;
4. \$60 application fee;
5. current curriculum vitae (resumé) and a statement of purpose (approximately 500 words for Master's and 10 pages for Ph.D.) indicating the field in which the applicant wishes to study and the reasons for applying to the program.

All of the above should be submitted directly to the Graduate Director, Department of East Asian Studies.

Deadline: March 1st for September admissions.

McGill's on-line application form for graduate program candidates is available at www.mcgill.ca/applying/graduate.

24.5 Program Requirements

Program Requirements for the M.A. Degree (*Ad Hoc*) (45 credits)

The Department only offers a thesis option. The M.A. program with thesis includes:

- a) four 3-credit courses (12 credits),
- b) one 3-credit seminar in theory/methodology (3 credits),
- c) one 6-credit seminar or two 3-credit seminars (6 credits), and
- d) thesis (24 credits).

Language Courses:

1. A maximum of 6 credits of language courses at the 500-level or in a classical Asian language may be counted towards course requirements.
2. Students must have fourth-level language equivalency by the completion of their M.A. program.

Program Requirements for the Ph.D. Degree (*Ad Hoc*)

After successfully completing the M.A. degree or its equivalent (45 credits minimum), a student will be admitted to the second year of the Ph.D. program. The Graduate Studies Committee will assign an advisory committee to advise the student and specify the student's course program.

Exceptional students with appropriate background at the undergraduate level may be admitted directly into the Ph.D. program.

Students must complete at least 24 course credits, with a grade point average of 3.5 or better: this course work must be chosen to identify three distinct fields for the Comprehensive Evaluation. Students may take up to two 3-credit courses or one 6-credit course in another department with the approval of the Graduate Studies Committee.

There are four requirements for obtaining the Doctoral degree:

1. Course work – 24 credits at the 600 or 700 level.
2. Language – Candidates will be required to demonstrate reading knowledge of a second Asian language, which may include either modern or literary (classical) language, in addition to the primary Asian language of their research. Candidates will also be expected to demonstrate reading knowledge of both French and English. They may also be required to take a third European language, classical (literary) Chinese, or Japanese, if the Graduate Studies Committee decides those languages are essential for the candidate's research.
3. Ph.D. Comprehensive Evaluation – After the session in which the course work is completed, and no more than one year later except in exceptional circumstances and approved by the Graduate Studies Committee, a candidate will be required to pass the Comprehensive evaluation.
4. Doctoral Dissertation – Within six months after successful completion of the Ph.D. Comprehensive Evaluation, doctoral students should submit to the Graduate Studies Committee, after consultation with the Graduate Program Director and

their potential thesis supervisor, a thesis proposal not exceeding five pages. Before submission of the dissertation, candidates are normally required to spend time in Asia researching their project. Research leading to original scholarship is a prerequisite for the acceptance of a Ph.D. thesis.

24.6 Courses for Graduate Students (M.A. and Ph.D.)

Students preparing to register should consult the Web at www.mcgill.ca/minerva (click on Class Schedule) for the most up-to-date list of courses available; courses may have been added, rescheduled or cancelled after this Calendar went to press. Class Schedule lists courses by term and includes days, times, locations, and names of instructors.

Term(s) offered (Fall, Winter, Summer) may appear after the credit weight to indicate when a course would normally be taught. Please check Class Schedule to confirm this information.

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

Note: All undergraduate courses administered by the Faculty of Arts (courses at the 100- to 500-level) have limited enrolment.

The course credit weight is given in parentheses after the title.

- Denotes courses not offered in 2003-04.

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

EAST 502 ADVANCED T

include original documents and videos from the business communications and other fields.

EAST 537D2 CHINA TODAY THROUGH TRANSLATION. (3)

EAST 540D1 FOURTH L

REQUIREMENTS FOR THE Ph.D. DEGREE

The requirements for the doctoral degree are:

1. 18 credits in Economics beyond the M.A. requirements, including successful completion of the Econometrics course (ECON 662D1/ECON 662D2) or its equivalent. Apart from ECON 662D1/ECON 662D2 or equivalent, at least two of these courses must be in a single field.
2. Successful completion of the Ph.D. Written Comprehensive Examination.
3. A dissertation.

ECON 665 QUANTITATIVE METHODS. (3) A survey of quantitative methods frequently used in economic research. Special emphasis will be placed upon the formulation and evaluation of econometric models. Illustrations will be drawn from the existing empirical literature in economics. Required for

Admission Requirements

Admission to this program is limited.

1. Applicants must hold **either**
 - a. an Honours or Major degree (minimum 54 credits) in psychology, with a CGPA of 3.0 out of 4.0 or better; or
 - b. a Baccalaureate degree in a field other than psychology, with a CGPA of 3.0 out of 4.0 or better, and sufficient academic preparation to meet the following requirements:
 - i. a minimum of 36 credits (substantive as distinguished from experiential content) in psychology which includes courses in theories of personality, history and systems of psychology, abnormal psychology, social psychology, inferential statistics, and developmental psychology, and
 - ii. a minimum number of credits in related disciplines in the social sciences sufficient to bring the total of (b.i) and (b.ii) to 54 credits.
 - c. A CGPA of 3.0 out of 4.0 or better in those courses which constitute the 54-credit requirement referred to in a. and b.
2. Normally preference will be given to applicants having related work experience in public mental health or educational settings.
3. Three (3) letters of recommendation.
4. Additional forms must be filed for admission to the program and may be obtained from the Program Coordinator (Secretary) (514) 398-4245. Applicants must provide an unofficial academic transcript before application to the program.
5. An interview with the Program Director or other faculty members may be required.

Program Requirements

This degree requires two years (four semesters) and one summer term of full-time study. All students must also attend weekly case conferences.

M.A.(Non-thesis) Counselling Psychology (60 credits)

Required Courses (30 credits)

Internship – Required (24 credits)

Elective Courses (6 credits)

M.A. (THESIS) COUNSELLING PSYCHOLOGY

The aim of the M.A. is to produce graduates who (a) are trained in the major academic areas of Counselling Psychology; (b) have sufficient research ability to evaluate research in counselling; (c) are able to design, conduct and interpret empirical research, and (d) can apply research methods in counselling to common problems and concerns in educational and clinical settings. This program is designed to prepare graduates for research and teaching in the field of counselling psychology and to give them the foundation for doctoral studies that have an emphasis on research. This degree does not fulfil the requirements for membership in either the Quebec Professional Order of Guidance Counsellors (OPCCOQ) or Quebec Order of Psychologists (OPQ) or for acceptance into the McGill Ph.D. in Counselling Psychology.

Graduates of the M.A. program will also need a supplementary internship experience if they wish to fulfil the requirements for membership in the Professional Order of Guidance Counsellors of Quebec (OPCCOQ). This will require an additional year of fieldwork experience. M.A. students are admitted to an internship/fieldwork only with approval of the program staff and if supervisory staff is available.

Admission Requirements

Same as for the M.A.(Non-thesis) Counselling Psychology. Admission to this program is limited.

Program Requirements

Credit for the thesis will be awarded upon satisfactory completion of the thesis components listed below. This degree requires a minimum of four semesters and one summer session of full-time study.

M.A. Counselling Psychology (48 credits)

Required Courses (21 credits)

Thesis Component – Required (24 credits)

Elective Course (3 credits)

Ph.D. IN COUNSELLING PSYCHOLOGY

This program is built on the scientist-practitioner model and is accredited by the Canadian and American Psychological Associations. Its aims are:

1. To develop professionals who are able to contribute to the advancement of knowledge in the field of counselling psychology through research that studies social phenomena that may impinge upon the practice of psychology. This research may be a study of the practice of counselling psychology or it may be broader in that it has indirect implications for practice.
2. To develop professionals who are able to evaluate the merits and weaknesses of current research in the field and its impli-

4. To develop professionals who are able to take a leadership role in the profession at a variety of levels including community, university and professional organizational levels.

Graduates of the program will be prepared to assume careers in education and community settings, including faculty positions, counselling and psychological positions on the staff of university

Elective Courses (27 credits)

Optional courses may be selected in consultation with the Program Director for the M.Ed. area of concentration from among the Department's graduate courses and from other courses offered at the graduate level in the University. Optional courses are selected so as to provide students with a coherent program of study in their area of interest and tailored to their needs.

M.Ed. Concentrations

Students may select these as part of their 27 credits of elective courses. Some courses also have prerequisites or corequisites that should be heeded in program planning. Students are welcome to propose to their faculty advisors or the Associate Program Director adaptations of these M.Ed. Concentrations.
Completion of the Family Li

Psychology. It is recommended that some prior study of a relevant branch of psychology form part of the undergraduate training.

2. CGPA of 3.0 out of 4.0 or higher in undergraduate studies.
3. Statements of academic and research experience, relevant professional training and experience.

Program Requirements

Candidates are required to follow an approved course of study, to select a topic for research, and to present the results of such research in the form of an acceptable thesis. Required courses ensure that each graduate will emerge with substantive knowledge of the content and methods used in educational psychology. Optional courses provide an opportunity for qualified candidates to study advanced topics related to their research and to diversify their knowledge of the discipline.

Required Courses (9 credits)

Thesis Component – Required

Admission Requirements

Students will normally follow the M.Ed. (rather than the M.A.) prior to the Ph.D. They should therefore make the following course substitutions and additions:

- EDPE 603 instead of EDPE 605,
- EDSL 630 or equivalent, instead of the alternative EDPE 684,
- and EDPE 676, if not already taken.

M.A. students will require EDPE 635 as an additional course.

Special Populations of Learners/Special Needs Option

Special Populations of Learners/Gifted Education Option

In addition, one of the Special Activities (EDPE 697 or EDPE 698) (6 credits each) must consist of the content of EDPI 536 and EDPI 537, Practicum Gifted Education 1 and 2 (3 credits each). Students may register either for the Practica or Special Activity.

Minor Sequences in the Ph.D.(Educational Psychology)

(a) Adult Education

(Admission to this minor sequence has been suspended.)

The Ph.D. Minor sequence in Adult Education is offered in collaboration with the Department of Integrated Studies in Education. The program especially addresses professional education and its links with studies in higher education, instructional psychology, and applied cognitive science.

Required Courses (9 credits)

(b) Applied Cognitive Science

Complementary Courses (9 credits)

(c) Applied Developmental Psychology

(d) Computer Applications in Education

(Admission to this concentration has been suspended.)

Complementary Courses (9 credits)

(e) Family Life Education

(f) Higher Education

Required Courses (9 credits)

(g) Instructional Psychology

Required Courses (6 credits)

Complementary Courses (3 credits)

(h) Psychology of Gender

Students selecting the Psychology of Gender Minor are encouraged to take EDEM 692 or EDSL 301 or the equivalent (qualitative research methods).

(i) Special Populations of Learners/Special Needs

(j) Special Populations of Learners/Gifted Education

26.5.4 Post-Ph.D. Graduate Diploma in School/Applied Child Psychology

This Post-Ph.D. Graduate Diploma enables holders of a doctorate in Psychology to respecialize in School/Applied Child Psychology. The course of study is adapted to the background of each student. The program includes exceptionally one, or typically two, years of courses and practica, plus a year of internship. Students register on a per-credit basis (including Internship).

Professional Accreditation

All elements of this Post-Ph.D. Graduate Diploma are selected from the professional components of the Ph.D. Educational Psychology My63 TD-.6(sdmTc-sITf12sn(())TJGEJ-15.5926 - in School/Ata-)ca,)-7.4(pE43-.

EDPC 502 GROUP PROCESSES AND INDIVIDUALS. (3) A laboratory course in which participants observe individual dynamics within a group setting as well as understand the developmental phases of the group. Participants will be encouraged to experiment with their own behaviour, in order to increase their own awareness of functioning.

EDPC 503 HUMAN SEXUALITY: PROFESSIONALS. (3) Historical, biological, anthropological, psychological and sociological perspectives of human sexual development. Sexual dysfunctions and approaches to sex therapy. Attitudes toward sexuality held by professional helpers relative to their implications for the learning and teaching of human sexuality and sex therapy.

EDPC 504 PRACTICUM: INTERVIEWING SKILLS. (3) (Prerequisite: EDPC 501) This course will enable students to become practitioners in the field of Applied Social Sciences. Theoretical principles of the helping relationship will be applied in particular situations. Demonstration, lecture, role-playing and psychodrama techniques will be used.

EDPC 505 CRISIS INTERVENTION PROCESSES. (3) Instruction in the skills of working with crisis situations involving persons emotionally disturbed, suicidal, or alcoholic, and those who are on drugs or experiencing emotional trauma, as well as other problems. Attention will be given to identification of referral sources and the writing of reports.

EDPC 507 PRACTICUM: GROUP LEADERSHIP SKILLS. (3) (Prerequisite: EDPC 502) The practical aspects of group leadership, group design and planning. Candidates will set up groups, conduct such groups over a number of sessions, and assess these groups according to the theoretical models covered in the prerequisite course.

EDPC 510 FAMILY LIFE EDUCATION AND MARRIAGE. (3) The contribution of central concepts of psychological theories and therapeutic systems to the understanding of marriage and relationships. Special attention will be given to gender and ethnicity issues in order to increase the sensitivity of students to the issues typically confronted in the modern marriage and family.

EDPC 542 COUNSELLING ROLE OF THE TEACHER. (3) Theory and practice in interpersonal communication, interviewing, group dynamics, group leadership management, and referral criteria and procedures for students with developmental problems who experience trauma or crisis. Addressed primarily to elementary and secondary teachers who combine instructional responsibilities with a supportive role in school guidance and counselling activities.

EDPC 562 CAREER EDUCATION AND GUIDANCE. (3) A review of career education and guidance programs that refer to the subject matter and related methods and techniques designed to foster the intellectual development of career awareness, career planning, career decision-making, and the necessary career-resilient employability skills for the school-to-work transition.

EDPC 606 THEORIES OF COUNSELLING 1. (3) An introduction to counselling theories especially as they are related to theories of personality, human development and learning.

EDPC 607 THEORIES OF COUNSELLING 2. (3) (Prerequisite: EDPC 606) A detailed study of phenomenological, developmental and behavioral theories of counselling among others.

EDPC 609 PSYCHOLOGICAL TESTING 1. (3) (Prerequisite: a basic statistics course.) For Counselling Psychology and School/Applied Child Psychology students. History of psychological testing, theoretical aspects of individual and group testing, basic theories of intelligence, and ethical and legal issues in testing. An introduction to tests of intelligence (particularly the WISC-R), aptitude, personality, and interests, including issues of validity, reliability, and construction.

EDPC 610 PSYCHOLOGICAL TESTING 2. (3) (Prerequisite: EDPC 609) (Required in School/Applied Psychology. Optional in Counselling Psychology, but recommended for students specializing in school or child counselling.) Theory and interpretation of intelligence tests, particularly the Wechsler and Binet scales. Practice

in writing test reports, particularly as a part of a case study. The use of intelligence test results in conjunction with other types of tests.

EDPC 615 ASSESSMENT AND DIAGNOSIS IN COUNSELLING. (3) An introduction to differential assessment and diagnosis for counsellors in educational and mental health settings. The clinical interview, the assessment process, the DSM-IV, relevant test instruments, diagnostic procedures, and development of treatment plans will be subjects of study. Models of record keeping and referral procedures will be reviewed.

EDPC 618 PROFESSIONAL ETHICS AND THE LAW. (3) (For Counselling Psychology and School/Applied Child Psychology students.) Ethics in the helping professions and some of the philosophical bases for making ethics decisions. Quebec and Canadian law relative to human rights of clients; responsibilities of counselling and school psychologists toward clients and society in general.

EDPC 662 CAREER PSYCHOLOGY. (3) Contemporary perspectives on career development, career planning and work values are reviewed. Current issues related to career development through the life stages such as personal values and aptitudes, the

and (3) diversified research experiences utilizing different techniques and instrumentation.
EDPC 780D2 P

cation, problem analysis, treatment implementation, and treatment evaluation of one case.

EDPE 712 NEUROLOGICAL BASES OF BEHAVIOR. (3) Development of human brain structure and function related to sensory, motor, emotional, perceptual, cognitive, and linguistics skills. Neuroanatomy and neurophysiology relevant to neuropsychological function, dysfunction, rehabilitation. Psychopharmacological influences.

EDPE 721D1 SCHOOL PSYCHOLOGY: ELEMENTARY. (3) (Prerequisite: EDPE 626) Open only to Ph.D. students in School/Applied Child Psychology. Field experience. Two days or 16 hours per week supervised by faculty members and a field supervisor in a school providing elementary education. Weekly class meetings. Students must also register for either EDPE 722 or EDPE 723 in the same academic year.

EDPE 721D2 SCHOOL PSYCHOLOGY: ELEMENTARY. (3)

EDPE 722D1 SCHOOL PSYCHOLOGY: SECONDARY. (3) (Prerequisite: EDPE 626) Open only to Ph.D. students in School/Applied Child Psychology. Field experience. Two days or 16 hours per week supervised by faculty members and a field supervisor in a school providing secondary education. Weekly class meetings. Students must also register for either EDPE 721 or EDPE 723 in the same academic year.

EDPE 722D2 SCHOOL PSYCHOLOGY: SECONDARY. (3)

EDPE 723D1 SCHOOL PSYCHOLOGY: COMMUNITY. (3) (Prerequisite: EDPE 626) Open only to Ph.D. students in School/Applied Child Psychology. Field experience. Two days or 16 hours per week supervised by faculty members and a field supervisor in a school providing secondary education. Weekly class meetings. Students must also register for either EDPE 721 or EDPE 723 in the same academic year.

EDPE 723D2 SCHOOL PSYCHOLOGY: COMMUNITY. (3)

EDPE 725D1 INTERNSHIP 1 - SCHOOL PSYCHOLOGY. (6) (Prerequisites: EDPE 708 and two of EDPE 721, EDPE [0D1]-7.4(I)]J6.48 0 0 9s and a PE 721,

Opportunity to plan, implement and evaluate curriculum for students with special needs, and participate as a team member.

EDPI 656D2 CLINIC PRACTICUM IN SPECIAL EDUCATION. (3)

EDPI 665 RESEARCH AND THEORY IN L

Ioannis Psaromiligkos; B.Sc.(Patras), M.Sc., Ph.D.(Buffalo)

Zilic Zeljko; B.Eng.(Zagreb), M.Sc., Ph.D.(Tor.)

Visiting Professor

Lorne Mason; B.Eng, Ph.D.(Sask.)

Lecturers

Kenneth L. Fraser; B.Eng., M.Eng.(McG.), Eng.

Danny Grant; M.Eng., Ph.D.(McG.)

Richard Vickers; B.Sc.(Wales)

Associate Members

Martin Buehler, Philippe Depalle, Gregory Dudek, Alan C. Evans,

William R. Funnell, Henrietta L. Galiana, Jean Gotman,

Robert E. Kearney, Bruce Pike, Bernard Segal

Adjunct Professors

Ray Bartnikas, Eduard Cerny, Charalambos Charalambous,

Cedric Guss, Maurice Huneault, Cheng K. Jen, Michael Kaplan,

Karim Khordoc, Irene Leszkowicz, Miguel Marin, Donald McGillis,

Douglas O'Shaughnessy, Norbert Puetz, Farouk Rizk,

Lucjan Wegrowicz

ber 2002 are required to have a minimum total score of 1800. Official results must be received before February 1st.

M.Eng. Degree (Admission Requirements)

The applicant must be the graduate of a recognized university and hold a Bachelor's degree equivalent to a McGill degree in Electrical or Computer Engineering or a closely allied field. An applicant holding a degree in another field of engineering or science will be considered but a qualifying year may be given to make up any deficiencies. The applicant must have a high academic achievement: a standing equivalent to a Cumulative Grade Point Average (CGPA) of 3.0 out of 4 (75%) or a GPA of 3.2 out of 4.0 for the last two full-time academic years. Satisfaction of these general requirements does not guarantee admission. Admission to graduate studies is limited and acceptance is on a very competitive basis.

Ph.D. Degree (Admission Requirements)

Candidates who fulfill the general requirements of the Graduate and Postdoctoral Studies Office and who possess a Master's degree may be accepted for a course of study leading to the Ph.D. degree in Electrical Engineering.

27.4 Application Procedures

Applications will be considered upon receipt of:

1. completed application form;
2. application fee (Can\$60);
3. two official copies of all previous transcripts;
4. two reference letters (sent directly by the referees);
5. TOEFL and GRE scores (if applicable).

The Department accepts most of its graduate students for September; the chance of acceptance for January is significantly lower.

Application deadlines:

September admission:
February 1 - all applicants.

January admission:
July 15 - International applicants
October 15 - Canadian citizens and Permanent Residents.

All documents must be received by the Department's Admissions Committee by the above deadlines.

McGill's on-line application form for graduate program candidates is available at www.mcgill.ca/applying/graduate.

27.5 Program Requirements

A student may satisfy the M.Eng. degree requirements by completing one of the following options:

M.Eng. Thesis Option (46 credits)

The Thesis option requires satisfactory completion of six graduate

must carry a full load (minimum of 12 credits) during the three terms of the residency requirement.

M.Eng. Non-Thesis (Project) Option (47 credits)

The Project option requires satisfactory completion of at least nine graduate level courses (with a grade of B or better) of which six courses must be chosen from the Department (ECSE 5xx or ECSE 6xx), plus a project (up to 20 credits), the total amounting to 47 credits. Students who are required to take more than three non-departmental courses must bring a letter of recommendation from their supervisors outlining the reason for such an action. There are no circumstances under which the maximum number of non-departmental courses will be raised above four.

methods, the FFT and its implementation. Multirate processing, subsampling and interpolation, oversampling techniques.

ECSE 521 DIGITAL COMMUNICATIONS 1. (3) (3-0-6) (Prerequisite: ECSE 411 or ECSE 511. Corequisite: ECSE 509) Modulation: orthogonal and biorthogonal signalling, MPSK, QAM, modulation with memory. Detection: coherent, noncoherent and differentially coherent detection, performance issues and channel capacity, synchronization. Coding: block and convolutional codes, fast Hadamard Transform decoding, Viterbi algorithm, turbo-codes. Bandlimited channels: intersymbol interference, spectral shaping, correlative coding, data estimation and channel equalization.

● **ECSE 522 ASYNCHRONOUS CIRCUITS AND SYSTEMS.** (3) (3-3-3) (Prerequisite: ECSE 323)

ECSE 523 SPEECH COMMUNICATIONS. (3) (3-0-6) (Prerequisite:

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 amp

