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## 1 Agricultural Economics

Department of Agricultural Economics  
Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue, QC H9X 3V9  
Canada

Telephone: (514) 398-7820  
Fax: (514) 398-8130  
E-mail: [agr.econ@mcgill.ca](mailto:agr.econ@mcgill.ca)  
Web site: [www.agrenv.mcgill.ca/agrecon](http://www.agrenv.mcgill.ca/agrecon)

Chair — J.C. Henning

### 1.1 Staff

#### Associate Professors

L.B.B. Baker; S.D.A., D.C.P.(Edin.), D.F.B.O.M.(Aberd.),  
M.Sc.(Man.), Ph.D.(McG.)  
K.R. Gunjal; B.Sc.(Poona), M.Sc.(New Delhi), Ph.D.(Iowa St.)  
J.C. Henning; B.Sc., Ph.D.(Guelph)  
P.J. Thomassin; B.Sc.(McG.), M.S., Ph.D.(Hawaii)

#### Adjunct Professor

Joan Marshall

### 1.2 Programs Offered

The Department of Agricultural Economics offers a program leading to the M.Sc.

It is possible for students to pursue doctoral studies through the Department of Economics with Agricultural Economics as a field of specialization. For specific requirements of that graduate program see the Department of Economics.

### 1.3 Admission Requirements

#### M.Sc.

Direct admission to the M.Sc. requires the completion of a B.Sc. in Agricultural Economics or a closely related area, with the equivalent cumulative grade point average of 3.0/4.0 (second class-upper) or 3.2/4.0 during the last two years of full-time university study. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program.

The ideal preparation includes courses in agricultural economics, economic theory (intermediate micro and macro), calculus, linear algebra, and statistics. Students with deficiencies in these areas will be required to take additional courses as part of their degree program.

### 1.4 Application Procedures

Applicants for graduate studies through academic units in the Faculty of Agricultural and Environmental Sciences must forward supporting documents to:

Student Affairs Office (Graduate Studies)  
Macdonald Campus of McGill University  
21,111 Lakeshore  
Sainte-Anne-de-Bellevue, QC H9X 3V9  
Canada

Telephone: (514) 398-7925  
Fax: (514) 398-7968  
E-mail: [grad@macdonald.mcgill.ca](mailto:grad@macdonald.mcgill.ca)

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](http://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 570 on the paper-based test or 230 on the computer-based test) or IELTS (minimum 7 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 suggested that students give serious consideration to their financial planning before submitting an application.**

**Qualifying Students** – Some applicants whose academic degrees and standing entitle them to serious consideration for admission to graduate studies, but who are considered inadequately prepared in the subject selected may be admitted to a *Qualifying Program* if they have met the Graduate and Postdoctoral Studies Office minimum CGPA of 3.0/4.0. The course(s) to be taken in a *Qualifying Program* will be prescribed by the aca-

demic unit concerned. *Qualifying students* are registered in graduate studies, **but not as candidates for a degree**. Only one qualifying year is permitted. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

## 1.5 Program Requirements

### M.Sc.

A minimum of 19 graduate course credits and the completion of a research thesis (27 credits) are required for the M.Sc. Students may specialize, by way of their research program, in agribusiness, development, finance, marketing and trade, policy, and resource and ecological economics.

Specific requirements are as follows:

1. Economic Theory (Micro and/or Macro) – 2 courses (6 credits)
2. Quantitative Methods – 1 course (3 credits)
3. Three other courses chosen in consultation with the Agricultural Economics Advisor with a minimum of one course in the Department of Agricultural Economics (9 credits).
4. Seminar (AGEC 690) (1 credit)
5. M.Sc. Thesis 1, 2, 3, 4, 5 (27 credits)

## 1.6 Graduate Courses

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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 not offered in 2003-04.
- **AGEC 503 METHODS OF REGIONAL ANALYSIS.** (3) (Winter) (Prerequisite: AGEC 200) (Not open to students who have taken GEOG 503)
- **AGEC 611 PRICE ANALYSIS.** (3) Topics in advanced microeconomic theory with applications in agricultural economics.
- **AGEC 620 STRATEGIC MANAGEMENT AND THE ENVIRONMENT.** (3)
- **AGEC 630 FOOD AND AGRICULTURAL POLICY.** (3)
- **AGEC 633 ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS.** (3) An advanced course in the theory and problems of environmental and resource economics and in the analytical techniques used to assess environmental and resource use issues.
- **AGEC 642 ECONOMICS OF AGRICULTURAL DEVELOPMENT.** (3) This course focuses on the role of agriculture in economic development. Topics covered will be - development theories, economic efficiency, employment, technology adoption and structural change in developing countries. Also, agriculture, food and development policies and implications for long term planning will be discussed.
- **AGEC 679 FINANCING: ALTERNATIVE STRATEGIES.** (3) An in-depth study of the relationship between financing, asset acquisition, tenure, and property rights and obligations for farm businesses. Emphasis will be placed on the potential for the use of non-debt financial instruments such as Community Based Land Trusts (CBLT) and Community Supported Agriculture (CSA).
- **AGEC 685 SELECTED TOPICS IN AGRICULTURAL ECONOMICS.** (3) This course is designed to permit students to explore agricultural economics topics that are not covered in other courses. Students may be asked to prepare a presentation or lead discussion on the selected topic for the benefit of other students and staff. (Pass/Fail grading.)
- **AGEC 690 SEMINAR.** (1) This course will focus on current research on economic problems of agriculture through presenta-

tions by staff, students and special guests. All graduate students are required to register for this course, and make at least one major presentation.

- **AGEC 691 M.Sc. THESIS 1.** (6)
- **AGEC 692 M.Sc. THESIS 2.** (3)
- **AGEC 693 M.Sc. THESIS 3.** (6)
- **AGEC 694 M.Sc. THESIS 4.** (6)
- **AGEC 695 M.Sc. THESIS 5.** (6)

## 2 Anatomy and Cell Biology

Department of Anatomy and Cell Biology  
Strathcona Anatomy and Dentistry Building  
3640 University Street  
Montreal, QC H3A 2B2  
Canada

Telephone: (514) 398-6335

Fax: (514) 398-5047

Web site: [www.med.mcgill.ca/anatomy](http://www.med.mcgill.ca/anatomy)

Chair — J.J.M. Bergeron

### 2.1 Staff

#### *Emeritus Professors*

Y. Clermont; B.Sc.(Montr.), M.Sc., Ph.D.(McG.)  
D.G. Osmond; B.Sc., M.B., Ch.B., D.Sc.(Brist.), F.R.S.C.  
H. Warshawsky; B.Sc.(Sir G.Wms), M.Sc., Ph.D.(McG.)

#### *Professors*

A. Beaudet\*; M.Sc., Ph.D., M.D.(Montr.)  
G.C. Bennett; B.A., B.Sc.(Sir G.Wms.), M.Sc., Ph.D.(McG.)  
J.J.M. Bergeron; B.Sc.(McG.), D.Phil.(Oxon)  
J.R. Brawer; B.S.(Tufts), Ph.D.(Harv.)  
M. Burnier\*; M.D., M.Sc., Ph.D.(Brazil)  
L. Hermo; B.A.(Montr.), M.Sc., Ph.D.(McG.)  
C.P. Leblond; M.D.(Paris), Ph.D.(Montr.), D.Sc.(Sorbonne)  
S.C. Miller; B.Sc.(Sir G.Wms.), M.Sc., Ph.D.(McG.)  
C.R. Morales; D.V.M.(Argentina), Ph.D.(McG.)  
B. Posner\*; M.D.(Man.), Ph.D.(Iowa)  
C.E. Smith\*; D.D.S., Ph.D.(McG.)

#### *Associate Professors*

P. Barker\*; B.Sc.(S.Fraser), Ph.D.(Alta.)  
O.W. Blaschuk\*; B.Sc.(Winn.), M.Sc.(Man.), Ph.D.(Tor.)  
E. Daniels; M.Sc., Ph.D.(Man.)  
S. David\*; Ph.D.(Man.)  
E. Davis; B.Sc., M.Sc.(W.Ont.), Ph.D.(McG.)  
A. Koromilas\*; B.Sc., Ph.D.(Aristotelian U., Greece)  
M.F. Lalli; B.S., M.A.(Bowling Green), Ph.D.(McG.)  
M. Latterich; B.Sc., Ph.D.(Durham)  
M. McKee\*; B.Sc., M.Sc., Ph.D.(McG.)  
P. McPherson\*; M.Sc.(Man.), Ph.D.(Iowa)  
A. Ribeiro-da-Silva\*; M.D., Ph.D.(Oporto)  
S. Stifani\*; Ph.D.(Rome), Ph.D.(Alta.)  
H. Vali\*; B.Sc., M.Sc., Ph.D.(Munich)  
D. Walker\*; B.Sc.(Geneva), Ph.D.(Salk), Ph.D.(Geneva)

#### *Assistant Professors*

C. Autexier; B.Sc.(C'dia) Ph.D.(McG.)  
F. Bedford; B.Sc.(Birm.), Ph.D.(Lond.)  
M. Greenwood\*; B.Sc., M.Sc.(C'dia), Ph.D.(McG.)  
T. Kennedy\*; B.Sc.(McM.), M.Phil., Ph.D.(Col.)  
N. Lamarche-Vane; B.Sc., Ph.D.(Montr.)  
C. Mandato; B.Sc., Ph.D.(Wat.)  
J.F. Presley; B.A., Ph.D.(Texas)  
W. Sossin\*; S.B.(M.I.T.), Ph.D.(Stan.)

#### *Associate Members*

C. Chalk, E. Chevet, C. Cuello, J. Henderson, P. Lasko, P. Seguela

*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 stromal cell-interactions of B lineage precursor cells in bone marrow; microenvironmental regulation of hemopoiesis; differentiation and regulation of cells mediating natural tumor immunosurveillance; tumor-cell biology; cell and molecular biology of the formation of dental enamel, dentin and bone; structure of organic matrices and inorganic crystals of dental enamel; role of hormones and their binding sites with calcified tissues; secretion and degradation of the proteins of enamel matrix, hypothalamo-pituitary function and gonadotropin patterns in ovarian follicular development; polycystic ovarian disease; computer assisted modeling of morphometric and kinetic data; cell biology and molecular genetics of ageing; senescence and cell cycle-specific genes and their products.

**Research in the Department** investigates the dynamics and organization of molecules, organelles, cells and tissues in several major systems of the body. The work makes fundamental contributions to a number of established and emerging multidisciplinary fields: cell and molecular biology, cellular immunology and hematology, reproductive biology, calcified tissue biology, tumor cell biology, developmental biology, neurobiology and ageing.

The Department offers contemporary facilities for the wide range of techniques currently employed in research. Modern methods of cell and molecular biology, immunology and biochemistry are used in conjunction with specialized microscopy in a variety of experimental systems. Techniques used by Department members include labeling with radioisotopes and other tracers, radioautography, immunocytochemistry, histochemistry, cryo immune microscopy, fluorescence microscopy, high resolution electron microscopy, scanning electron microscopy, backscattered electron imaging, confocal microscopy, microinjection, video-microscopy in living cells, X-ray microanalysis, electron diffraction, freeze-fracture replication, computer reconstruction and quantitation, chromatography, subcellular fractionation, recombinant DNA technology, in situ hybridization, tissue grafting, cell and tissue culture, mutant and transgenic mice, hybridomas, and monoclonal antibodies.

The Department has one of the largest electron microscope facilities in Canada. Currently in use are three modern electron microscopes, including a high voltage instrument, the JEOL 2000FX. Combined with some of these microscopes are computer-aided analytical equipment capable of elemental microanalysis, histomorphometry, reconstruction and quantitation. The high voltage microscope is particularly useful for certain analytical

electron optical procedures such as electron diffraction, lattice imaging and stereo electron microscopy.

## 2.3 Admission Requirements

### M.Sc. and Ph.D. Programs

1. A B.Sc. degree in life sciences or any of M.D., D.D.S. or D.V.M. degrees from a university of recognized reputation.
2. Evidence of a high academic achievement with a minimum Cumulative Grade Point Average (CGPA) of 3.3 on 4.0.

### Admission to a Qualifying Program

Applicants whose academic degree and standing entitle them to serious consideration for admission to graduate studies, but who are considered inadequately prepared in the area chosen may, upon recommendation of the Graduate Student Affairs Committee and with the permission of the Director of the Graduate and Postdoctoral Studies Office, be admitted to Qualifying Programs. The courses to be taken in qualifying programs will be stipulated by the Graduate Student Affairs Committee. (Note: Only one qualifying program of a maximum of one year is permitted.)

## 2.4 Application Procedures

Application for admission to graduate studies for the degrees of M.Sc. or Ph.D. in Anatomy should be made to the Chair of Graduate Studies, Department of Anatomy and Cell Biology.

Application forms and a brochure giving full details of the Graduate Program are available upon request.

### Documents Required

1. Two official copies of complete university-level academic records to date (this also applies to McGill University transcripts). It may be desirable to submit a list of the titles of the courses taken, if transcripts give code numbers only. It is the applicant's responsibility to contact the institution(s) attended and request that the transcripts be forwarded directly to the Department of Anatomy.
2. Two letters of recommendation. It is the applicant's responsibility to arrange that these letters are originals, sent directly to the Department of Anatomy from the persons specified by the applicant.
3. Fee of \$60 in Canadian funds for processing the application.
4. TOEFL score (where applicable).

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

## 2.5 Program Requirements

The M.Sc. program is a 48-credit program. Students must complete 15 credits in course work and 33 credits of thesis research (ANAT 698 and ANAT 699).

For the Ph.D. degree, the student must complete a series of courses selected to suit individual requirements. In addition, Ph.D. candidates will write a comprehensive examination after the end of the first year.

For both degrees, the major emphasis is placed on the conduct of original research and the preparation of a thesis.

## 2.6 Courses

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.**

**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.

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 organs.

**ANAT 663D2 HISTOLOGY.** (4.5) (Prerequisite: ANAT 663D1) (No credit will be given for this course unless both ANAT 663D1 and ANAT 663D2 are successfully completed in consecutive terms)

**ANAT 690D1 CELL AND DEVELOPMENTAL BIOLOGY.** (3) (Students must also register for ANAT 690D2) (No credit will be given for this course unless both ANAT 690D1 and ANAT 690D2 are successfully completed in consecutive terms) Current developments in molecular cell biology and developmental biology will be presented by course coordinators and staff from primary papers in the scientific literature. These will be researched and critiqued by students through oral and written presentations. Two term papers are required for students taking the course.

**ANAT 690D2 CELL AND DEVELOPMENTAL BIOLOGY.** (3) (Prerequisite: ANAT 690D1) (No credit will be given for this course unless both ANAT 690D1 and ANAT 690D2 are successfully completed in consecutive terms)

**ANAT 698 M.Sc. THESIS RESEARCH 1.** (24)

May be offered as: **ANAT 698D1 and ANAT 698D2.**

**ANAT 699 M.Sc. THESIS RESEARCH SEMINAR.** (9)

May be offered as: **ANAT 699D1 and ANAT 699D2.**

**ANAT 701 Ph.D. COMPREHENSIVE EXAMINATION.** (0)

May be offered as: **ANAT 701D1 and ANAT 701D2.**

### 3 Animal Science

Department of Animal Science  
Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue, QC H9X 3V9  
Canada

Telephone: (514) 398-7794  
Fax: (514) 398-7964  
E-mail: [animal.science@mcgill.ca](mailto:animal.science@mcgill.ca)  
Web site: [www.mcgill.ca/animal](http://www.mcgill.ca/animal)

Chair — X. Zhao

#### 3.1 Staff

##### *Emeritus Professor*

J.E. Moxley; B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(C'nell)

##### *Professors*

R.B. Buckland; B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(Maryland)  
E.R. Chavez; Agr.Eng.(Chile), M.Sc. Ph.D.(Calif.)  
B.R. Downey; D.V.M.(Tor.), Ph.D.(McG.)  
J.F. Hayes; B.Agr.Sc., M.Agr.Sc.(Dub.), Ph.D.(N.C.St.)  
U. Kuhnlein; B.Sc.(Fed. Inst. of Tech., Zurich), Ph.D.(Geneva)  
K.F. Ng-Kwai-Hang; B.Sc.(Agr.), M.Sc., Ph.D.(McG.)

##### *Associate Professors*

R.I. Cue; B.Sc.(Newcastle-upon-Tyne), Ph.D.(Edin.)  
H. Monardes; Ing. Agr.(Concepcion, Chile), M.Sc., Ph.D.(McG.)  
L.E. Phillip; B.Sc.(Agr.), M.Sc.(Agr.)(McG.), Ph.D.(Guelph)  
K.M. Wade; B.Sc.(Agr.), M.Sc.(Agr.)(Dublin), Ph.D.(C'nell)  
D. Zadworny; B.Sc., Ph.D.(Guelph)  
X. Zhao; B.Sc., M.Sc.(Nanjing), Ph.D.(C'nell) (*William Dawson Scholar*)

##### *Assistant Professors*

V. Bordignon; D.V.M.(URCAMP, Brazil), M.Sc.(UFPEL, Brazil), Ph.D.(Montreal)  
R. Lacroix; B.Sc., M.Sc.(Que.), Ph.D.(McG.) (PT)  
A.F. Mustafa; B.Sc., M.Sc.(Khartoum), Ph.D.(Sask.)

##### *Associate Member*

R.C. Chian, Faculty of Medicine

##### *Adjunct Professors*

C. Keefer, P. Lacasse, D. Lefebvre, B. Murphy, D. Petitclerc, J. Turner

### 3.2 Programs Offered

The Department provides laboratory facilities for research work leading to the degrees of Master of Science and Doctor of Philosophy in the disciplines of animal breeding (genetics), nutrition, and reproductive physiology, molecular biology, milk biochemistry and information systems. Within these areas advantage may be taken of strong research programs and expertise in molecular biology and milk biochemistry.

Students registered in the Department of Animal Science may develop programs in conjunction with other units at McGill, for example the Nutrition and Food Science Centre or the School of Dietetics and Human Nutrition.

Each student has an advisory committee composed of the thesis supervisor and at least two other faculty members.

### 3.3 Admission Requirements

#### **M.Sc. (Thesis)**

Candidates are required to have either a Bachelor's degree in Agriculture or a B.Sc. degree in an appropriate, related discipline with an equivalent cumulative grade point average of 3.0/4.0 (second class-upper division) or 3.2/4.0 during the last two years of full-time university study. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program.

#### **M.Sc. Applied**

All candidates are required to have a B.Sc. degree or equivalent.

#### **Ph.D.**

Candidates are normally required to have an M.Sc. degree in an area related to the chosen field of specialization for the Ph.D. program.

### 3.4 Application Procedures

Applicants for graduate studies through academic units in the Faculty of Agricultural and Environmental Sciences must forward supporting documents to:

Student Affairs Office (Graduate Studies)  
Macdonald Campus of McGill University  
21,111 Lakeshore  
Sainte-Anne-de-Bellevue, QC H9X 3V9  
Canada

Telephone: (514) 398-7925  
Fax: (514) 398-7968  
E-mail: [grad@macdonald.mcgill.ca](mailto:grad@macdonald.mcgill.ca)

Applications will be considered upon receipt of a signed and 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](http://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 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.

**Financial aid is very limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application.**

Acceptance to all programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support. Normally, a student will not be accepted unless adequate financial support can be provided by the student and/or

the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships or other funds.

**Qualifying Students** – Some applicants whose academic degrees and standing entitle them to serious consideration for admission to graduate studies, but who are considered inadequately prepared in the subject selected may be admitted to a *Qualifying Program* if they have met the Graduate and Postdoctoral Studies Office minimum CGPA of 3.0/4.0. The course(s) to be taken in a *Qualifying Program* will be prescribed by the academic unit concerned. *Qualifying students* are registered in graduate studies, **but not as candidates for a degree**. Only one qualifying year is permitted. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

### 3.5 Program Requirements

#### M.Sc. (Thesis)

Four one-term courses or the equivalent and two seminar courses at the post-graduate level are required, as a minimum, although a student may be advised to take additional courses as specified by his/her advisory committee. Advanced undergraduate courses may be considered for graduate credit if approved by the student's committee and the Graduate and Postdoctoral Studies Office and passed at the graduate level; generally, this will not constitute more than one of the four required courses.

A minimum of 45 credits and completion of an acceptable thesis is required for the M.Sc. degree; 14 credits are for course work and 31 credits for the thesis (ANSC 680, ANSC 681, ANSC 682, and ANSC 683). Exceptional M.Sc. students may be considered for Ph.D. status after one full year in the Department.

#### M.Sc. Applied (45 credits)

The M.Sc. Applied (non-thesis) degree is oriented to animal scientists already working in industry or government, to undergraduate students inspired by concepts in sustainable and integrated animal agriculture, to project leaders interested in animal resource management and to veterinarians. The program aims to provide graduate training in applied areas of animal production with a view towards integrating technology and management in animal production with allied areas of agricultural resource utilization.

#### Required Course (3 credits)

ANSC 501 (3) Advanced Animal Production Systems.

#### Complementary Courses (27 credits)

9 credits must be in Animal Science at the graduate level  
18 credits can be selected from a recommended list where no more than 6 credits can be chosen from undergraduate level courses.

#### Project Component – Required (15 credits)

ANSC 643 (3) Project 1  
ANSC 644 (3) Project 2  
ANSC 645 (3) Project 3  
ANSC 646 (3) Project 4  
ANSC 647 (3) Project 5

#### Ph.D.

Since the Ph.D. is primarily a research degree, the amount of course work required may comprise a smaller portion of the total than is the case for the M.Sc., this will depend on the background of the individual student, and must be approved by the student's advisory committee. This course work must include two seminar courses at the graduate level and the Ph.D. Comprehensive Examination ANSC 701.

The thesis must clearly show originality and be a contribution to knowledge.

### 3.6 Courses

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.**

**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.

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

- Denotes courses not offered in 2003-04.

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

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

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

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

**ANSC 605 ESTIMATION: GENETIC PARAMETERS.** (3) (3 lectures) (Given in alternate years.) General methods for the estimation of components of variance and co-variance are considered, with specific emphasis given to their application to heritability, repeatability and genetic correlation estimation.

- **ANSC 606 SELECTION INDEX AND ANIMAL IMPROVEMENT.** (3) (3 lectures)

**ANSC 607 LINEAR MODELS IN AGRICULTURAL RESEARCH.** (3) (3 lectures) The theory and application of linear models to agricultural research is considered. Special emphasis is given to the analysis of experimental and survey data with unequal subclass numbers.

- **ANSC 611 ADVANCED REPRODUCTIVE PHYSIOLOGY.** (3) (2 lectures, 1 seminar) (Given in alternate years.)

**ANSC 622 SELECTED TOPICS IN MOLECULAR BIOLOGY.** (3) (1 lecture and 2 seminars) (Prerequisite: MICR 500 or permission of instructor) Key examples of applications of molecular biology to the study of animal physiology and animal genetics will be drawn from the current literature and discussed in depth. The course has a dual purpose. It will familiarize students with current events at the forefront of molecular biology and will teach them how to read and critically evaluate research publications.

**ANSC 623 TECHNIQUES MOLECULAR GENETICS: DNA SEQUENCING.** (3) Growth of bacterial cells and isolation of plasmids containing DNA; dideoxysequencing of double-strand DNA; separation using urea-polyacrylamide gels; autoradiography and sequence analysis including use of DNAsis and genbank/EMBL databases.

**ANSC 624 TECHNIQUES MOLECULAR GENETICS: DNA FINGERPRINTING.** (3) (Requires previous laboratory experience.) Isolation of DNA from blood, tissue samples or plant material (students can choose their preferred source of DNA and problem). Digestion of the DNA with restriction enzymes. Agarose gel electrophoresis; Southern blotting; hybridisation with a DNA fingerprinting probe;

autoradiography; interpretation (i.e. genetic variability, genetic relationship or paternity).

**ANSC 625 TECHNIQUES MOLECULAR GENETICS: POLYMERASE CHAIN REACTION.** (3) Isolation of genomic DNA; amplification of target sequences using the polymerase chain reaction; analysis of the product using restriction enzymes and electrophoresis (polyacrylamide or agarose gel electrophoresis).

**ANSC 630 EXPERIMENTAL TECHNIQUES: ANIMAL SCIENCE: MACRO.** (3) (1 lecture, 1 lab) Lectures and laboratories dealing with animal experimentation. Emphasis on the design and conduction of animal studies, selection of experimental animals, chemical and biological assays, statistical analysis, interpretation of data and preparation of technical reports.

**ANSC 635 VITAMINS AND MINERALS IN NUTRITION.** (3) (3 lectures) Modularised course dealing with advanced topics in Nutrition. The core of the course will focus on vitamins and minerals.

**ANSC 636 ANALYSIS - ANIMAL BREEDING RESEARCH DATA.** (3) (3 lectures) An advanced graduate course to give training and experience in statistical techniques applied to quantitative genetics and animal breeding. To consider aspects of data handling of large data sets (100,000 observations), checks for consistency and connectedness in data. Considerations in choosing efficient analytical procedures in fitting these models and development of efficient numerical algorithms to apply these procedures.

**ANSC 680 M.Sc. THESIS 1.** (7) Independent research under the direction of a supervisor toward completion of M.Sc. thesis.

**ANSC 681 M.Sc. THESIS 2.** (7) Independent research under the direction of a supervisor toward completion of M.Sc. thesis.

**ANSC 682 M.Sc. THESIS 3.** (7) Independent research under the direction of a supervisor toward completion of M.Sc. thesis.

**ANSC 683 M.Sc. THESIS 4.** (10) Final submission and approval of M.Sc. thesis.

**ANSC 691 SPECIAL TOPIC: ANIMAL SCIENCES.** (3) Prescribed reading, conference or practical work on a selected topic in the student's area of specialization, not otherwise available in other courses; under staff supervision. An approved course outline must be on file in the Departmental office prior to registration deadline.

**May be offered as: ANSC 691D1 and ANSC 691D2, or ANSC 691N1 and ANSC 691N2.**

- **ANSC 692 TOPIC IN ANIMAL SCIENCES 1.** (3)

**ANSC 692D1 TOPIC IN ANIMAL SCIENCES 1.** (1.5) (Students must also register for ANSC 692D2) Prescribed reading, conference or practical work on a selected topic in the student's area of specialization, not otherwise available in other courses; under staff supervision. An approved course outline must be on file in the Departmental office prior to registration deadline.

**ANSC 692D2 TOPIC IN ANIMAL SCIENCES 1.** (1.5) (Prerequisite: ANSC 692D1)

**May be offered as: ANSC 692N1 and ANSC 692N2.**

**ANSC 695 ANIMAL SCIENCE SEMINAR 1.** (1) (1 hour) One of two seminars to be given by all students in an M.Sc. program. Consists of a review of literature in relation to the student's proposed research and an experimental design of the research to be conducted.

**ANSC 696 ANIMAL SCIENCE SEMINAR 2.** (1) (1 hour) One of two seminars to be given by all students in an M.Sc. 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.

**ANSC 701 DOCTORAL COMPREHENSIVE EXAMINATION.** (0) (See Faculty Regulations)

**May be offered as: ANSC 701D1 and ANSC 701D2.**

**ANSC 797 ANIMAL SCIENCE SEMINAR 3.** (1) (1 hour) One of two seminars to be given by all students in a Ph.D. program. Review of literature in relation to the student's proposed research and an experimental design of the research to be conducted.

**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](http://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.Phil.(Cantab.)

James M. Savelle; B.Sc., M.Sc.(Ott.), M.A.(Ark.), Ph.D.(Alta.)

Colin H. Scott; B.A.(Regina), M.A., Ph.D.(McG.)

#### Assistant Professors

André Costopoulos; B.A.(McG.), M.Sc.(Montr.), Ph.D.(Oulu, Finland)

Sandra T. Hyde; B.A.(U.C. Santa Cruz), M.P.H.(Hawaii), Ph.D.(U.C. Berkeley)

Rebecca Hardin; B.A.(Brown), M.Phil., Ph.D.(Yale) (*joint appoint. with McGill School of Environment*) (*on leave Jan.-Dec. 2003*)

### 4.2 Programs Offered

The Department offers training leading to the M.A. and Ph.D. in Anthropology. Admission is to the M.A. program, except when a student already holds a Master's degree. It is expected, however, that most applicants will be oriented towards achievement of the Ph.D.

The Department offers several alternative M.A. programs:

1. M.A. with thesis;
2. M.A. with research paper;
3. M.A. in Medical Anthropology, with or without thesis.

### 4.3 Admission Requirements

#### Master's

Admission to the M.A. program is open competitively to students holding an Honours or Major B.A. in Anthropology. Outstanding candidates with B.A. degrees in other disciplines but with substantial background related to anthropology are sometimes admitted

on the condition that they complete a specified number of additional courses in Anthropology.

The applicants admitted usually have undergraduate Grade Point Averages of 3.5 or above on a 4.0 point scale.

#### Ph.D.

Admission to the Ph.D. program is open competitively to students with a Master's degree in Anthropology. In very special circumstances candidates with Master's degrees in related disciplines may be admitted.

### 4.4 Application Procedures

The deadlines for receipt of all application material for September admission is January 1.

Applications will be considered upon receipt of:

1. Graduate Application Form;
2. application fee (\$60), official transcripts;
3. two letters of recommendation;
4. statement of research interests (including reasons for wanting to pursue them at McGill); and
5. test results (GRE, TOEFL), if required.  
(Canadian applicants are exempted from the GRE.)  
(For international students, a minimum TOEFL score of 550 or 213 on computer-based test is required.)

The Department admissions committee announces its selections by mid-March.

A number of teaching assistantships are available to graduate students in the Department. Applicants who wish to be considered for an assistantship, a McGill Recruitment Fellowship, or for Differential Fee Waivers (for international students) should include a note to that effect with their applications. For information regarding a variety of other fellowship programs, see the "Graduate Fellowships and Awards" section of the Graduate and Postdoctoral Studies Calendar.

Application information is available on the Department Web site.

### 4.5 Program Requirements

#### M.A. Degree

The purpose of the M.A. program is to provide advanced level training in anthropology and to prepare students for research at the Ph.D. level.

#### M.A. Degree with Thesis (48 credits)

The Master's degree with thesis is a 48-credit program: 4 courses (12 credits) and the M.A. thesis (36 credits).

The student's program of work, which is based on his/her research interests, is developed in consultation with the student's supervisor and the two other members of his or her advisory committee. Students are required to take four courses in the form of seminars and/or tutorials. The set of four courses should be directed toward and converge in the thesis research. M.A. thesis research may take the form of fieldwork but a library thesis is strongly advised so that students can proceed more rapidly to the Ph.D.

#### M.A. Degree with Research Paper (45 credits)

The Master's degree with research paper is a 45-credit program: 5 courses (15 credits), a Proseminar (6 credits) and the research paper (24 credits).

The student's program of work is developed in consultation with the student's supervisor and the two other members of his or her advisory committee. It consists of: five courses (seminars or tutorials), only one of which is optional, a research paper proposal and the research paper. They must also attend the Proseminar. The research paper will normally be based on library research but can involve limited and preferably local fieldwork. The research paper should demonstrate the student's ability to define a problem, place it in a theoretical and factual context, collect and analyze data, and write up a report.

**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 the following differences: students are required to take two Seminars in Medical Anthropology (HSSM 605, ANTH 615), as two of their four courses.

**b) M.A. with Research Paper**

This option is offered as an alternative for students with a background in Anthropology. Students are required to take five courses: two Seminars in Medical Anthropology (HSSM 605, ANTH 615) as well as the following courses in anthropology: Theory 1, Research Methods, and Quantitative Methods. They must also attend the Anthropology Proseminar. In addition, students are required to write a research paper.

**c) Special M.A. with Research Paper**

This course of study is taken by students who lack a strong academic background in anthropology. These students are required to take eight courses (24 credits), including two seminars in Medical Anthropology (HSSM 605, ANTH 615) and at least five additional graduate courses in anthropology (Theory 1 and Research Methods are recommended). In addition, students are required to write a research paper.

**Ph.D. Degree**

The purpose of the Ph.D. program is to enable a student to make an original contribution to anthropological research in the form of a doctoral thesis. This must be based on a comprehensive understanding of prior research relevant to the topic investigated.

All requirements for the M.A. must be completed. Students holding an M.A. from another department may be requested to take seminars covering deficiencies in their previous training. Those who hold an M.A. without thesis are required to take two extra courses (ANTH 702 Advanced Theory and ANTH 760 Advanced Methods) in either Anthropology or Archaeology.

Candidates must (1) pass a language exam; (2) demonstrate comprehensive understanding of prior research in three subfields of anthropology through the successful completion of three courses; these courses are the Ph.D. Tutorials listed below; (3) submit and orally defend a research proposal; and (4) carry out field research and submit an original thesis for examination and oral defense.

- 1) A language examination, normally French, must be passed before an oral examination of the research proposal may be scheduled. Francophone students can satisfy the language requirement by demonstrating competency in English. The purpose of the language requirement is to ensure that the student has access to anthropological literature in at least two languages. Under special circumstances, a language other than English or French may be substituted, provided that there is sufficient anthropological literature on the student's research topic in that language.
- 2) Within the first year of Ph.D. study, students will select a thesis supervisor and at least two other thesis committee members. One of the latter may be from outside the Department. The committee as a whole helps the student to develop a topic for research, to learn the state of the art regarding the topic, and to write a research proposal. To ensure that students under-

stand prior research, they must define three subfields which intersect with the thesis topic. One of these subfields is usually the literature on the geographic region where fieldwork will be carried out. One or more committee members will tutor the student in each selected subfield, and the student will prepare a bibliography of works read and discussed as well as a concise evaluation of the material covered in each. This written work will demonstrate understanding of prior research in each subfield.

- 3) The thesis proposal is also prepared in consultation with the committee members and under the direction of the thesis supervisor. It contains a brief review of the literature and controversies in the three relevant subfields, and a discussion of the proposed research (background, methods and hypotheses to be tested). When the proposal is finished, it must be read and approved by all members of the committee before it is submitted for oral examination. Copies of the proposal and of the bibliographies relating to the three subfields must be made available to all professors in the Department at least one week before the hearing.

The oral examination of the proposal and the three subfields is open to all staff and students. The first part of the examination will explore the student's general understanding of the three subfields selected. In the second part, the student may be questioned on the merits of any part of the proposal: theoretical assumptions, hypotheses, methods, understanding of the literature.

- 4) If the proposal is passed, the student will then carry out field research and write a thesis. Thesis drafts are read and commented on by the thesis committee. When the thesis is ready for examination, it is submitted to the Graduate and Postdoctoral Studies Office, which appoints an internal examiner (usually from within the Department) and an external examiner (an acknowledged authority in the field from outside the university). If both examiners approve the thesis, an oral defense is arranged before a committee appointed by GPSO.

**4.6 Courses for Higher Degrees**

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.**

**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.

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

● **ANTH 555 ADVANCED TOPICS IN ETHNOLOGY.** (3)

**ANTH 602 THEORY 1.** (3)

**ANTH 603 THEORY 2.** (3)

**ANTH 605 CULTURE AREA.** (3)

**ANTH 607D1 PROSEMINAR IN ARCHAEOLOGY.** (3)

**ANTH 607D2 PROSEMINAR IN ARCHAEOLOGY.** (3)

**ANTH 609D1 PROSEMINAR IN ANTHROPOLOGY.** (3)

**ANTH 609D2 PROSEMINAR IN ANTHROPOLOGY.** (3)

**ANTH 610 SOCIAL ORGANIZATION.** (3)

- 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 PH.D. PRELIMINARY EXAMINATION. (3)
- ANTH 700D2 PH.D. PRELIMINARY EXAMINATION. (3)
- ANTH 702 ADVANCED ANTHROPOLOGICAL THEORY. (3)
- ANTH 760 ADVANCED ANTHROPOLOGICAL METHODS. (3)
- ANTH 770 ADVANCED ARCHAEOLOGICAL THEORY. (3)
- ANTH 773 ADVANCED ARCHAEOLOGICAL METHODS. (3)
- ANTH 780 READING AND RESEARCH. (3)
- ANTH 781 READING AND RESEARCH. (3)
- ANTH 790 PH.D. TUTORIAL 1. (3)
- May be offered as: ANTH 790D1 and ANTH 790D2.
- ANTH 791 PH.D. TUTORIAL 2. (3)
- May be offered as: ANTH 791D1 and ANTH 791D2.
- ANTH 792 PH.D. TUTORIAL 3. (3)
- May be offered as: ANTH 792D1 and ANTH 792D2.

## 5 Architecture

School of Architecture  
Macdonald Harrington Building  
815 Sherbrooke Street West  
Montreal, QC H3A 2K6  
Canada

Telephone: (514) 398-6700

Fax: (514) 398-7372

Web site: [www.mcgill.ca/architecture](http://www.mcgill.ca/architecture)

*Director* — David Covo

*Graduate Program Coordinator* — Alberto Pérez-Gómez

### 5.1 Staff

#### *Emeritus Professor*

Harold Spence-Sales; B.A.(Well.), A.A.Dipl., L.L.D.(S. Fraser)

#### *Professors*

Bruce Anderson; B.Arch.(McG.), M.Arch.(Harv.), F.R.A.I.C.,  
O.A.Q., A.A.P.P.Q.

Vikram Bhatt; N.Dip Arch.(Ahmed.), M.Arch.(McG.), M.R.A.I.C.

Derek Drummond; B.Arch.(McG.), F.R.A.I.C., O.A.Q., O.A.A.

(*William C. Macdonald Professor of Architecture*)

Avi Friedman; B.Arch.(Technion), M.Arch.(McG.), Ph.D.(Montr.),  
O.A.Q., I.A.A.

Alberto Pérez-Gómez; Dipl.Eng.(Nat.Pol.Inst.Mexico), M.A.,  
Ph.D.(Essex) (*Saidye Rosner Bronfman Professor of  
Architectural History*)

Adrian Sheppard; B.Arch.(McG.), M.Arch.(Yale), F.R.A.I.C.,  
O.A.Q., A.A.P.P.Q.

Radoslav Zuk; B.Arch.(McG.), M.Arch.(M.I.T.), D.Sc.(U.A.A.),  
F.R.A.I.C., O.A.Q., O.A.A.

#### *Associate Professors*

Annamarie Adams; B.A.(McG.), M.Arch., Ph.D.(Calif.), M.R.A.I.C.  
(*William Dawson Scholar*)

Martin Bressani; B.Sc.(McG.), B.Arch.(McG.), M.Sc.(Arch.)(MIT),  
D.E.A.(Paris-Sorbonne), Docteur (Paris-Sorbonne - Paris IV),  
O.A.Q.

Ricardo Castro; B.Arch.(Los Andes, Col.), M.Arch., M.A.(Oregon),  
M.R.A.I.C.

David Covo; B.Sc.(Arch.), B.Arch.(McG.), F.R.A.I.C., O.A.Q.

Robert Mellin; B.Arch., M.Sc.(Arch.)(Penn.State), M.Arch.(McG.),  
M.Sc., Ph.D.(U.Penn.), M.R.A.I.C., N.A.A.

Pieter Sijpkes; B.Sc.(Arch.), B.Arch.(McG.)

#### *Lecturers*

Manon Asselin, Patrice Bégin, Jean D'Aragon, Maxime Gagné,  
Simon Jones, Richard Klopp, Marie-Paule MacDonald,  
David Theodore, Lyse Tremblay, Roland Ulfig

#### *Adjunct Professors*

Cecile Baird, Ewa Bieniecka, Lawrence Bird, Julia Bourke,  
Michael Carroll, Nathalie David, Howard Davies, Georges Drolet,  
Gordon Edwards, François Émond, Julia Gersovitz,  
Mark Ginocchio, Dan Hanganu, Phyllis Lambert, Seymour Levine,  
Anna Mainella, Harry Mayerovitch, Serge Melanson,  
Rosanne Moss, Carl Mulvey, Joanna Nash, Louise Pelletier,  
Mark Poddubiuk, Louis Pretty, Daniella Rohan, Jacques  
Rousseau, Richard Russell, Robert Stanley, Fred Weiser,  
Samson Yip, Jozef Zorko

### 5.2 Programs Offered

M.Arch.I (professional), M.Arch. II (post-professional), Graduate  
Diploma in Housing, Ph.D.

The professional M.Arch.I program is accredited by the Canadian Architectural Certification Board (CACB), and is recognized as accredited by the National Council of Architectural Registration Boards (NCARB) in the U.S.A.

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 preparing for the professional practice for architecture. While graduation from a CACB-accredited program does not assure registration, the accrediting process is intended to verify that each accredited program substantially meets those standards that, as a whole, comprise an appropriate education for an architect.

### 5.3 Admission Requirements

#### M.Arch. I (professional) Program

Students holding the McGill B.Sc.(Arch.) degree, or equivalent, with a cumulative grade point average of at least 3.0 on a scale of 4.0, are eligible to apply for admission.

#### M.Arch. II (post-professional) and Graduate Diploma in Housing

Students holding an accredited professional degree in architecture, or equivalent, with a cumulative grade point average of at least 3.0 on a scale of 4.0, are eligible to apply for admission. In special cases, candidates with a degree in a related field may be considered.

#### Ph.D.

Candidates with high standing in McGill's M.Arch.II, or who hold an equivalent degree from another university, are eligible to apply to this program. Those who do not have an appropriate background in the chosen research area may be admitted to Ph.D.I. Candidates who have an adequate background at the post-professional Master's level in the proposed area of research will be admitted to Ph.D.II.

A working knowledge of a language or languages relevant to the area of research may be required.

### 5.4 Application Procedures

#### Professional Master of Architecture: M.Arch.I

McGill B.Sc.(Arch.) Graduates:

1. Completed on-line application form accessible from the School's Web site at [www.mcgill.ca/architecture](http://www.mcgill.ca/architecture) or from [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).
2. A non-refundable application fee of \$60 (Cdn.).
3. A portfolio (8½" x 11" format) that includes the following:
  - samples of studio work from previous studies (please use Studio Project Description Form\*),
  - samples of freehand drawing and sketching,
  - samples of professional work.

4. Summary of work experience (please use Work Experience Report form\*).

Others:

1. Completed on-line application form accessible from the School's Web site at [www.mcgill.ca/architecture](http://www.mcgill.ca/architecture) or from [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).
2. A non-refundable application fee of \$60 (Cdn.).
3. A portfolio (8½" x 11" format) that includes the following:
  - samples of studio work from previous studies (please use Studio Project Description Form\*),
  - samples of freehand drawing and sketching,
  - samples of professional work.
4. Summary of work experience (please use Work Experience Report form\*).
5. Two sets of official transcripts sent directly by the registrars of all universities attended.
6. Two confidential letters of reference sent directly by the referees to the School of Architecture (please use Confidential Report on Applicant form\*).
7. Course calendar descriptions of previous college and/or university studies.
8. Completed Program Comparison Chart\*.
9. Proof of English language proficiency - minimum TOEFL score of 550 on the paper-based test (or 213 on the computer-based test). Please refer to the *Graduate and Postdoctoral Studies Calendar*, General Information section 5.3.

\*These documents are available in PDF format on the School of Architecture Web site.

#### Post-professional programs:

#### M.Arch. II, Ph.D. and Graduate Diploma in Housing

1. Completed on-line application form accessible from the School's Web site at [www.mcgill.ca/architecture](http://www.mcgill.ca/architecture) or from [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).
2. A non-refundable application fee of \$60 (Cdn.).
3. Two sets of official transcripts sent directly by the registrars of all universities attended.
4. Two confidential letters of reference sent directly by the referees to the School of Architecture.
5. A statement indicating the option chosen and the general area of research to be undertaken. Ph.D. applicants must submit a 3-page research proposal.
6. A portfolio (8½" x 11" format) containing at least five examples of the applicant's work. Folded drawings are unacceptable.
7. At least one example of a report or paper written by the applicant.
8. Proof of English language proficiency (TOEFL) – minimum score of 550 on the paper-based test (or 213 on the computer-based test). Please refer to the *Graduate and Postdoctoral Studies Calendar*, General Information section 5.3.

### 5.5 Program Requirements

#### M.Arch. I

McGill's professional program in Architecture is structured as a four-and-a-half-year, or nine-term, course of study divided into two parts. The first part is a six-term design program leading to a non-professional degree, Bachelor of Science (Architecture). Further information on the B.Sc.(Arch.) program can be found in the Faculty of Engineering section of the *Undergraduate Programs Calendar*, available at [www.mcgill.ca](http://www.mcgill.ca). The second part, for students with the B.Sc.(Arch.) degree, or the equivalent, is the professional Master of Architecture program.

The professional Master of Architecture program is a one-and-a-half year, or three-term course of studies leading to the M.Arch. I degree.

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

ARCH 550	(3)	Urban Planning 1
ARCH 551	(3)	Urban Planning 2
ARCH 554	(2)	Mechanical Services
ARCH 555	(2)	Environmental Acoustics
ARCH 671	(4)	Design Research and Methodology
ARCH 672	(6)	Architectural Design 1
ARCH 673	(8)	Architectural Design 2
ARCH 674	(2)	Professional Practice 1
ARCH 675	(2)	Professional Practice 2
ARCH 676	(2)	Specifications and Building Costs
ARCH 678	(3)	Advanced Construction
ARCH 679	(1)	Architectural Journalism
ARCH 680	(1)	Sketching School 2

6 credits of complementaries/electives, of which a minimum of 3 credits must be from an architectural complementary.

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 to advance their knowledge in the housing field, are not able, or inclined, to undertake studies towards a Master's degree.

**5.6 Courses**

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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 limited enrolment

● Denotes courses not offered in 2003-04.

**ARCH 520 MONTREAL: URBAN MORPHOLOGY.** (3) (2-1-6) (Prerequisite: ARCH 251) Historical, geographical, demographical, and regional evolution of the metropolis of Montreal. Topics include: important quarters, the Montreal urban grid, industrialization, reform movements, geographical diversity, urban culture, local building techniques and materials. Basic concepts of urban morphology and their relationships to the contemporary urban context will be explored.

● **ARCH 521 STRUCTURE OF CITIES.** (3) (2-0-7) (Prerequisite: ARCH 202 or permission of instructor)

□ **ARCH 522 HISTORY OF DOMESTIC ARCHITECTURE IN QUEBEC.** (3) (2-0-7) (Prerequisite: ARCH 251) (Departmental permission required) The architecture of houses in Quebec from 1650 to the present. Distinguished buildings are reviewed from the point of view of form, style, siting and material, as influenced by climate, culture and architectural antecedents in France, England and the United States. The course material is presented through alternating bi-weekly lectures and seminars.

● □ ★ **ARCH 523 SIGNIFICANT TEXTS AND BUILDINGS.** (3) (2-0-7) (Prerequisite: ARCH 251) (Alternating with ARCH 524) (Departmental permission required)

● □ ★ **ARCH 524 SEMINAR ON ARCHITECTURAL CRITICISM.** (3) (2-0-7) (Prerequisite: ARCH 251) (Alternating with ARCH 523) (Departmental permission required)

□ **ARCH 525 SEMINAR ON ANALYSIS AND THEORY.** (3) (2-0-7) (Prerequisite: ARCH 202 or permission of instructor) (Departmental permission required) Analysis and evaluation of significant architectural projects with reference to contemporary architectural theories.

**ARCH 526 PHILOSOPHY OF STRUCTURE.** (3) (2-0-7) (Prerequisite: ARCH 202 or permission of Instructor) (Not open to students who have taken ARCH 374) Philosophy of Structure aims to investigate structure in its broadest sense. The course is divided in two halves; the first one gives an overview of the development of theoretical structural frameworks such as mathematics and geometry, while the second one highlights physical structures constructed by nature (geology, turbulence), man or animals.

**ARCH 527 CIVIC DESIGN.** (3) (2-0-7) (Prerequisite: ARCH 378) The elements of form in buildings and their siting design in the urban setting.

**ARCH 528 HISTORY OF HOUSING.** (3) (2-0-7) (Prerequisite: ARCH 251 or permission of instructor) Indigenous housing both transient and permanent, from the standpoint of individual structure and pattern of settlements. The principal historic examples of houses including housing in the age of industrial revolution and contemporary housing.

**ARCH 529 HOUSING THEORY.** (3) (2-0-7) (Prerequisite: ARCH 528 or permission of instructor) A review of environmental alternatives in housing; contemporary housing and the physical and sociological determinants that shape it; Canadian housing.

**ARCH 531 ARCHITECTURAL INTENTIONS VITRUVIUS - RENAISSANCE.** (3) (2-0-7) (Prerequisite: ARCH 251) Architectural intentions embodied in buildings and writings of architects from antiquity to the Renaissance. Special emphasis is placed on the cultural connections of architecture to science and philosophy.

**ARCH 532 ORIGINS OF MODERN ARCHITECTURE.** (3) (2-0-7) (Prerequisite: ARCH 251) Examination of architectural intentions (theory and practice) in the European context (especially France, Italy and England), during the crucial period that marks the beginning of the modern era.

**ARCH 540 SELECTED TOPICS IN ARCHITECTURE 1.** (3) (2-0-7) A course to allow the introduction of new topics in Architecture as needs arise, by regular and visiting staff.

**ARCH 541 SELECTED TOPICS IN ARCHITECTURE 2.** (3) (2-0-7) A course to allow the introduction of new topics in Architecture as needs arise, by regular and visiting staff.

**ARCH 550 URBAN PLANNING 1.** (3) (2-0-7) (Prerequisite: B.Sc.(Arch.) or permission of instructor) (Not normally open to

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

**ARCH 551 URBAN PLANNING 2.** (3) (2-1-6) (Prerequisite: ARCH 550) Urban design and project development, theory and practice. Detailed analysis of selected examples of the development process and of current techniques in urban design. Includes case studies from Quebec and elsewhere.

**ARCH 554 MECHANICAL SERVICES.** (2) (2-0-4) (Prerequisite: ARCH 405 or permission of instructor) Problems encountered in providing mechanical services in buildings. Physiological and environmental aspects of heat, ventilation and air conditions, estimation of heating and cooling loads and selection and specification of equipment. Sprinkler systems and plumbing. Construction problems produced by installation of this equipment.

**ARCH 555 ENVIRONMENTAL ACOUSTICS.** (2) (2-0-4) (Prerequisite: ARCH 405 or permission of instructor) Acoustics in architectural design, and in environmental control of buildings. Acoustical requirements in the design of auditoria such as theatres, lecture halls, opera houses, concert halls, churches, motion picture theatres, studios. Principles of noise and vibration control, sound insulating in building construction. Practical noise control in various types of buildings.

**ARCH 622 CRITICAL WRITING.** (3) (2-1-6) Seminar to critically review an architectural topic.

**ARCH 623 PROJECT PREPARATION.** (3) (2-1-6) Guided background preparation for the project.

**ARCH 624 HISTORY AND THEORY PROJECT.** (15) (0-15-30) Thematic, site-specific experimental design with an emphasis on process, including 1) survey/mapping and 2) preparation of text, drawings and models.

**ARCH 627 RESEARCH METHODS.** (3) (2-1-6) Different approaches and research methods in housing. Setting of goals and objectives, identification of appropriate research methods, collection and evaluation of information, analysis and synthesis of data, and presentation of the findings.

**ARCH 628 HOUSING PROJECT REPORT.** (15) (0-15-30) A supervised project report based on material developed by candidates in the project preparation course. It may include on-site explorations of housing projects, surveying and documentation, critical analysis, and creative mapping of the same, plus an evaluation report.

**ARCH 630 HOUSING SEMINAR 1.** (3) (2-0-7) Strategies for affordable and low-cost housing. Investigation of cost-saving measures both at urban and dwelling unit levels. An analysis of recent low-cost housing projects.

**ARCH 631 HOUSING SEMINAR 2.** (3) (2-0-7) Strategies for affordable and low-cost housing. Investigation of cost-saving measures both at urban and dwelling unit levels. An analysis of recent low-cost housing projects.

**ARCH 634 HOUSING REPORT.** (6) (2-10-6) Human settlements problems in poverty areas; design of components and servicing systems for low cost housing; economic and technological evaluation of housing designs. Lectures and studio work leading to a comprehensive project report.

**ARCH 635 SELECTED TOPICS IN HOUSING 1.** (3) (3-0-6) Special topics related to housing.

**ARCH 636 SELECTED TOPICS IN HOUSING 2.** (3) (3-0-6) Special topics related to housing.

**ARCH 645 HOUSING PROJECT 1.** (6) (2-10-6) Innovative housing designs; lectures and studio work leading to a design project.

**ARCH 646 HOUSING PROJECT 2.** (6) (2-10-6) Innovative housing designs; lectures and studio work leading to a design project.

**ARCH 650 ARCHITECTURAL HISTORY SEMINAR 1.** (8) (3-5-16) Western Architectural history from Antiquity to the Renaissance. A hermeneutic reading of primary sources, i.e. a section or chapter of an historical treatise, a frontispiece or image, in the framework of recent scholarship on the subject.

**ARCH 651 ARCHITECTURAL HISTORY SEMINAR 2.** (8) (3-5-16) Early Modern European theory of architecture, 17th - 19th centuries. A hermeneutic reading of primary sources, i.e. a section or chapter of an historical treatise, a frontispiece or image, in the framework of recent scholarship on the subject.

**ARCH 652 ARCHITECTURAL THEORY SEMINAR 1.** (4) (4-0-8) Phenomenology and hermeneutic.

**ARCH 653 ARCHITECTURAL THEORY SEMINAR 2.** (4) (4-0-8) The experience of modernity in cultural criticism, philosophy, literature and art.

**ARCH 671 DESIGN RESEARCH AND METHODOLOGY.** (4) (1-4-7) An architectural design problem is selected, bibliographic research undertaken, site selection established: program developed and theoretical approach evolved in preparation for course ARCH 673.

**ARCH 672 ARCHITECTURAL DESIGN 1.** (6) (2-10-6) A series of complex architectural and urban design issues are addressed with the intention of improving the student's facility to critically assess existing design solutions, to seek alternatives and to articulate clearly the rational and the impact of alternative proposals.

**ARCH 673 ARCHITECTURAL DESIGN 2.** (8) (2-14-8) (Prerequisite: ARCH 671 and ARCH 672) An individual, student-selected and faculty-approved study of complex architectural design objectives involving site and building program constraints, the integration of building systems and the demonstration of comprehensive design and presentation skills.

**ARCH 674 PROFESSIONAL PRACTICE 1.** (2) (2-0-4) The architect's relationship to his/her client: responsibility, business conduct, supervision, arbitration, issuing of certificates, competitions, standard forms of contracts, payments, liens, servitudes, public health, building regulations, fees.

**ARCH 675 PROFESSIONAL PRACTICE 2.** (2) (2-0-4) (Prerequisite: ARCH 674) The construction process will be examined. Topics include project and construction management, contracting methods, tendering, sureties, site safety, negotiations, cost control, quality control, delay claims, legal hypothecs. Standard documentation and procedures will be reviewed, including CCDC contract, OAQ forms, CSC MasterFormat.

**ARCH 676 SPECIFICATIONS AND BUILDING COSTS.** (2) (2-0-4) Principles of writing architectural specifications; discussion of actual specifications and practice in specifying for common trades; essays on common building materials; costing of materials and building assemblies.

**ARCH 678 ADVANCED CONSTRUCTION.** (3) (2-0-7) (Prerequisite: ARCH 674) An exploration of construction in relation to architectural design; research in advanced methods of construction and structure related to design problems and built projects; appropriate technologies and alternatives.

**ARCH 679 ARCHITECTURAL JOURNALISM.** (1) (0-0-3) (Prerequisite: ARCH 674) The project deals with the review and criticism of a recently constructed controversial building.

**ARCH 680 SKETCHING SCHOOL 2.** (1) (0-0-3) An eight-day supervised field trip in the late summer to sketch places or things having specific visual characteristics.

**ARCH 700 DISSERTATION PROPOSAL.** (0) Evaluation of research proposals to finalize a preliminary thesis proposal. Development of a comprehensive framework for the research project.

**ARCH 701 COMPREHENSIVE ORAL EXAMINATION.** (0) Presentation of research to an Advisory Committee, including a comprehensive review of material in the field.

**ARCH 702 PROGRESS REPORT 1.** (0) Research in progress and the writing of the dissertation.

**ARCH 703 PROGRESS REPORT 2.** (0)

## 6 Art History

Department of Art History and Communication Studies  
Arts Building, W-225 (West Wing, top floor)  
853 Sherbrooke Street West  
Montreal, QC H3A 2T6  
Canada

Telephone: (514) 398-6541

Fax: (514) 398-7247

E-mail: [ahcs@mcgill.ca](mailto:ahcs@mcgill.ca)

Web site: [www.arts.mcgill.ca/programs/AHCS](http://www.arts.mcgill.ca/programs/AHCS)

*Chair* — Christine Ross

*Director, Graduate Programs in Art History* —

Hans J. Böker (on leave Sept. 2002 - Dec. 2003)

*Acting Director, Graduate Programs in Art History* —

Christine Ross — *Director, Graduate Programs in Communication* — Will Straw

### 6.1 Staff

#### *Emeritus Professors*

John M. Fossey; B.A.(Birm.), D.U.(Lyon II), F.S.A., R.P.A.  
George Galavaris; M.A.(Athens), M.F.A., Ph.D.(Prin.), F.R.S.C.  
George Szanto; B.A.(Dart.), Ph.D.(Harv.)

#### *Professor*

Hans J. Böker; Ph.D.(Saarbrücken), Dr. Ing.-habil(Hannover)  
(on leave Sept. 2002 - Dec. 2003)

#### *Associate Professors*

David Crowley; B.A.(Johns H.), M.Sc.(Penn.), Ph.D.(McG.)  
Christine Ross; M.A.(C'dia.), Ph.D.(Paris I)  
Will Straw; B.A.(Carl.), M.A., Ph.D.(McG.)

#### *Assistant Professors*

Jenny Butman; B.A.(C'dia), M.A., Ph.D.(York)  
Ting Chang; B.A.(McG.), M.A.(Tor.), Ph.D.(Sussex) (on leave  
2003-04)

Charmaine Nelson; B.F.A., M.A.(C'dia), Ph.D.(Man.)  
Bronwen Wilson; B.A., M.A.(U.B.C.), Ph.D.(Northwestern) (on  
leave 2003-04)

Angela Vanhaelen; B.A.(W.Ont.), M.A., Ph.D.(U.B.C.)

#### *Assistant Professor (Special Category)*

Francesca Dal Lago; B.A.(Univ. of Venice), M.A., Ph.D.(NYU)

#### *Adjunct Professors*

David W. Booth, Louis De Moura Sobral, Johanne Lamoureux,  
Charles Levine, Charles Naubert-Riser, Jocelyne Picot

### 6.2 Programs Offered

M.A. and Ph.D.

Areas of Specialization:

Western Medieval Art; Medieval Architecture; Post Medieval  
Architecture; Renaissance Art; Baroque Art; Late Eighteenth,  
Nineteenth and Early Twentieth-Century Art; the Art of W.W. I to  
the Present; Canadian Art; Methodology; Feminist Art History

To obtain financial aid information please consult the Graduate  
and Postdoctoral Studies Web site at [www.mcgill.ca/gps](http://www.mcgill.ca/gps) or e-mail  
[graduate.fellowships@mcgill.ca](mailto:graduate.fellowships@mcgill.ca).

For programs in Communications, refer to [section 18](#).

### 6.3 Admission Requirements

Entrance into either the M.A. or Ph.D. programs is limited to the  
best qualified applicants. A minimum CGPA of 3.3 out of 4.0 or the  
equivalent, i.e., B+ (75%), is required.

To apply to the M.A. program, candidates are normally  
expected to have a B.A. Honours degree either in Art History

alone or in Art History and one other closely related field. But  
regardless of the program, the Department normally requires a  
minimum of 36 credits (at least 12 courses) in Art History with  
emphasis on European art and architecture. For candidates from  
institutions not offering the above number of credits in Art History,  
provision is made, upon consultation with the Director of Gradu-  
ate Programs, for a program of study which would then qualify the  
candidate to apply for M.A. work.

In order to apply to the Ph.D. program, candidates must nor-  
mally hold an M.A. degree preferably in Art History or an M.A.  
degree in a closely related field together with an appropriate  
number of Art History credits such as are described for entrance  
into the M.A. program. Applicants are strongly encouraged to con-  
sult with the Director of Graduate Programs. The number of  
entrants to the doctoral program is necessarily limited to the most  
highly qualified applicants.

It should be noted that courses in studio practice, although  
useful, cannot be counted among the 36 Art History credits for  
either the M.A. or Ph.D. programs. Also please see as well the lan-  
guage requirements given under the degree programs below.

The Department also requires a 250-word statement outlining  
the candidate's major interest in Art History as well as an example  
of written work. Applicants should send complete dossiers by Jan-  
uary 15 to the Graduate Administrative Coordinator, Department  
of Art History and Communication Studies.

### 6.4 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 Cana-  
dian 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 explana-  
tion of the grading system used by the applicant's university is  
essential. It is the applicant's responsibility to arrange for tran-  
scripts 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 instruc-  
tors familiar with the applicant's work, preferable in the appli-  
cant'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 submit-  
ted as part of the application.
6. Statement of interest of at least 250 words addressing the can-  
didate's major interest in Art History and the proposed area of  
research.
7. An example of written work.
8. Proof of Citizenship (certified photocopy of passport, birth cer-  
tificate or equivalent).

Deadline for application is January 15.

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](http://www.mcgill.ca/applying/graduate).

## 6.5 Program Requirements

### Master of Arts

#### M.A. Degree (48 credits)

- Five 3-credit courses approved by the Department of which, with the approval of the Director of Graduate Programs, not more than two may be taken outside the Department. (15 credits)
- The M.A. written examinations. (ARTH 601, ARTH 602) (9 credits)
- Thesis (ARTH 699) on a topic approved by the Department in one of the following areas:  
Western Medieval Art; Medieval Architecture; Post Medieval Architecture; Renaissance Art; Baroque Art; Late Eighteenth, Nineteenth and Early Twentieth-Century Art; The Art of W.W.I to the Present; Canadian Art; Methodology; Feminist Art History (24 credits)

Language requirements for the M.A. degree: reading knowledge of English and French and a minimum of one additional approved classical or modern language, before admission to the second year of the M.A. program.

### Ph.D. Degree

The Ph.D. requirements are fulfilled progressively with five 3-credit courses of which, with the approval of the Director of Graduate Programs, not more than two may be taken outside the Department. The Ph.D. examinations both written and oral, the Doctoral dissertation and its oral defence.

Language requirements for the Ph.D. degree: reading knowledge of three modern languages and, depending on the field, at least one classical language, approved by the Department.

The Department is prepared to direct dissertations in fields wherein adequate supervision and resources can be provided: see [section 6.2](#). Candidates are also advised to consult the General Information section of the *Graduate and Postdoctoral Studies Calendar*.

## 6.6 Courses for Higher Degrees

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

Students may also consult the Department Web site ([www.arts.mcgill.ca/programs/AHCS](http://www.arts.mcgill.ca/programs/AHCS)) for information.

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

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

**ARTH 601 MASTERS COMPREHENSIVE PREPARATION.** (3) (The general examination for the M.A. degree (ARTH 602, 6 credits; including preparation for it, ARTH 601, 3 credits) carries a total weight of nine (9) credits.)

**ARTH 602 MASTERS COMPREHENSIVE EXAMINATION.** (6) (The general examination for the M.A. degree (ARTH 602, 6 credits; including preparation for it, ARTH 601, 3 credits) carries a total weight of nine (9) credits.)

**ARTH 617 MODERN ART.** (3)

**ARTH 618 ART HISTORY - 1400-1900 1.** (3)

**ARTH 619 ART HISTORY - 1400-1900 2.** (3)

**ARTH 630 DIRECTED READING COURSE.** (3) Directed Reading Course for graduate students in Art History.

**ARTH 648 ART OF THE ITALIAN RENAISSANCE.** (3)

**ARTH 653 BAROQUE ART AND ARCHITECTURE.** (3)

**ARTH 656 19TH CENTURY PAINTING AND SCULPTURE.** (3)

**ARTH 657 19TH CENTURY PAINTING AND SCULPTURE.** (3)

**ARTH 660 CONTEMPORARY ART AND CRITICISM.** (3)

**ARTH 661 CONTEMPORARY ART AND CRITICISM.** (3)

**ARTH 687 PROBLEMS IN WESTERN MEDIEVAL ARCHITECTURE AND SCULPTURE.** (3)

**ARTH 699 THESIS RESEARCH.** (24)

**May be offered as: ARTH 699D1 and ARTH 699D2, OR ARTH 699N1 and ARTH 699N2.**

**ARTH 701 PH.D. COMPREHENSIVE EXAMINATION.** (6)

**May be offered as: ARTH 701D1 and ARTH 701D2, OR ARTH 701N1 and ARTH 701N2.**

**ARTH 705 THESIS METHODS.** (3) (Restriction: For Art History graduate students only.) The aim is to introduce the student to research methods specific to his/her area of dissertation work.

**ARTH 731 CURRENT PROBLEMS: ARCHITECTURAL HISTORY 2.** (3)

### The following courses will not be offered in 2003-04:

ARTH 641 Greek Art and Archaeology 1. (3)

ARTH 642 Greek Art and Archaeology 2. (3)

ARTH 643 Greek Art and Archaeology 3. (3)

ARTH 646 Medieval Art and Archaeology. (3)

ARTH 647 Art of the Italian Renaissance. (3)

ARTH 654 Baroque Art and Architecture. (3)

ARTH 655 Baroque Art and Architecture. (3)

ARTH 675 Renaissance and Post-Renaissance 1. (3)

ARTH 678 Renaissance and Post-Renaissance 2. (3)

ARTH 679 Roman Art and Archaeology 1. (3)

ARTH 714 Research: Modern Architecture - 1750 to Present. (3)

ARTH 715 Research: Modern Architecture - 1750 to Present. (3)

ARTH 716 Research: Modern Architecture - 1750 to Present. (3)

ARTH 724 Art Criticism 2. (3)

ARTH 725 Methods in Art History. (3)

ARTH 730 Current Problems: Architectural History 1. (3)

## 7 Atmospheric and Oceanic Sciences

Department of Atmospheric and Oceanic Sciences  
Burnside Hall  
805 Sherbrooke Street West, Room 945  
Montreal, QC H3A 2K6  
Canada

Telephone: (514) 398-3764

Fax: (514) 398-6115

E-mail: [graduateinfo.aos@mcgill.ca](mailto:graduateinfo.aos@mcgill.ca)

Web site: [www.mcgill.ca/meteo](http://www.mcgill.ca/meteo)

Chair — J.R. Gyakum

### 7.1 Staff

#### Emeritus Professors

R.R. Rogers; B.Sc.(Texas), S.M.(M.I.T.), Ph.D.(N.Y.)

E.J. Stansbury; M.A., Ph.D.(Tor.)

#### Professors

J.F. Derome; B.Sc., M.Sc.(McG.), Ph.D.(Mich.)

H.G. Leighton; B.Sc., M.Sc.(McG.), Ph.D.(Alta.)

C.A. Lin; B.Sc.(Br.Col.), Ph.D.(M.I.T.)

L.A. Mysak; B.Sc.(Alta.), M.Sc.(Adel.), A.M. Ph.D.(Harv.), F.R.S.C.

R. E. Stewart; B.Sc.(Man.), M.Sc., Ph.D.(Tor.)

M.K. Yau; S.B., S.M., Sc.D.(M.I.T.)

I.I. Zawadzki; B.Sc.(Buenos Aires), M.Sc., Ph.D.(McG.)

**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 global atmospheric data. Graduate students have access to large and small computers, including the NEC supercomputer of the Meteorological Service of Canada.

Financial assistance in the form of research or teaching assistantships is available for all qualified graduate students.

**7.3 Admission Requirements**

Applicants for the M.Sc. program must meet the general requirements of the Graduate and Postdoctoral Studies Office and hold a bachelor's degree with high standing in atmospheric science, physics, mathematics, engineering, or equivalent.

The normal requirement for admission to the Ph.D. program is an M.Sc. degree in atmospheric science, physical oceanography, or related discipline with acceptably high standing. Students without a Master's degree in Atmospheric Science (Meteorology) or Physical Oceanography but with a strong background in related disciplines (physics, mathematics, engineering) may be admitted to the Ph.D. program. They enter at the Ph.D. I rather than the Ph.D. II level, and devote the first year of the program mainly to course work.

Inquiries should be addressed directly to the Chair of Admissions, Department of Atmospheric and Oceanic Sciences.

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

**7.4 Program Requirements****M.Sc. Degree**

Depending on their background, students must take from 9 to 27 credits of courses chosen from any course offered by the Department at the 500 and 600 levels, up to but not including ATOC 691. In some instances, courses in this Department may be replaced by courses given by other departments at the 500 level or higher with the approval of the Department. Usually, students with no previous background in atmospheric science (or physical oceanography) are required to take 27 credits of courses, while students with a strong B.Sc. or Diploma in meteorology or a related field may take as few as 9 credits of courses.

Students must also complete a minimum of 24 thesis-research credits from ATOC 691, ATOC 692, ATOC 693, ATOC 694, ATOC 695, ATOC 696 and ATOC 699. All students must take seminar course ATOC 694 and complete ATOC 699. The M.Sc. degree requires a minimum of 45 credits in total. This includes course credits, a minimum of 12 thesis credits and the completion of a thesis satisfying all the requirements of the Graduate and Postdoctoral Studies Office. Normally the equivalent of 12 months of full-time work is required to obtain these thesis-research credits, in addition to the time needed for the courses mentioned in the preceding paragraph. It is possible for students to write a thesis based on research in atmospheric, oceanic, or climate topics.

**M.Sc. - Computational Science and Engineering (CSE) Option** (minimum 46 credits)

Students can complete the CSE Option by including in their course selection MATH 669D1/MATH 669D2, plus two of CIVE 602, COMP 522, COMP 540, COMP 566, MATH 578 and MATH 579; and two other approved courses from a list available in the Department of Atmospheric and Oceanic Sciences but which will usually be ATOC 513 and ATOC 515. The rest of the credits are thesis courses.

**Ph.D. Degree**

The Ph.D. program consists of supervised research and normally a minimum of two approved courses. Candidates are required to submit a written thesis proposal, to present a Ph.D. proposal seminar and to take the Ph.D. oral comprehensive examination. The standard Graduate and Postdoctoral Studies Office requirements concerning a thesis must be satisfied.

**7.5 Courses for Higher Degrees**

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

**Note:** All undergraduate courses administered by the Faculty of Science (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.

**ATOC 512 ATMOSPHERIC AND OCEANIC DYNAMICS.** (3) (Fall) (3 hours lectures) Introduction to the fluid dynamics of large-scale flows of the atmosphere and oceans. Stratification of atmosphere and oceans. Equations of state, thermodynamics and momentum. Kinematics, circulation, and vorticity. Hydrostatic and quasi-geostrophic flows. Brief introduction to wave motions, flow over topography, Ekman boundary layers, turbulence.

**ATOC 513 WAVES AND STABILITY.** (3) (Winter) (3 hours lectures) Linear theory of waves in rotating and stratified media. Geostrophic adjustment and model initialization. Wave propagation in slowly varying media. Mountain waves; waves in shear flows.

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

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

**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. Ageostrophic circulations and hydrostatic instabilities. Kinematic and thermodynamic methods of computing vertical motions. Tropical and extratropical condensation rates. Barotropic and equivalent barotropic atmospheres.

**ATOC 541 SYNOPTIC METEOROLOGY 2.** (3) (Winter) (2 hours lectures; 2 hours laboratory) Analysis of current meteorological data. Quasi-geostrophic theory, including the omega equation, as it relates to extratropical cyclone and anticyclone development. Frontogenesis and frontal circulations in the lower and upper troposphere. Cumulus convection and its relationship to tropical and extratropical circulations. Diagnostic case study work.

**ATOC 546 CURRENT WEATHER DISCUSSION.** (1) (Winter) (2 hours) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Half-hour briefing on atmospheric general circulation and current weather around the world using satellite data, radar observations, conventional weather maps, and analyses and forecasts produced by computer techniques.

**ATOC 550 SPECIAL TOPICS METEOROLOGY AND OCEANOGRAPHY.** (1) (Fall) (1 hour lecture) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Lectures and seminars on special topics such as hydrology, agricultural meteorology, the limits of predictability, planetary atmospheres, atmospheric and oceanic pollution, coastal currents, and research reviews.

● **ATOC 558 NUMERICAL METHODS AND LABORATORY.** (3) (Winter) (1 hour lecture; 4 hours laboratory)

**ATOC 568 OCEAN PHYSICS.** (3) (Winter) (3 hours lectures) (Restricted to Graduate students and final-year Honours Atmospheric Science students. Others by special permission.) Research methods in physical oceanography including data analysis and literature review. Course will be divided into five separate modules focussing on temperature-salinity patterns, ocean circulation, boundary layers, wave phenomena and tides.

● **ATOC 616 TOPICS - GEOPHYSICAL FLUID DYNAMICS.** (3) (3 hours)

● **ATOC 619 ATMOSPHERIC CHEMISTRY.** (4) (3 hours) (Prerequisites: CHEM 213, CHEM 273, MATH 222 and MATH 315 or equivalents, or permission of instructor) (Restriction(s): Offered in odd years. Students should register in CHEM 619 in even years. Not open to students who have taken or are taking ATOC 419, CHEM 419, or CHEM 619)

**ATOC 620 PHYSICAL METEOROLOGY 1.** (3) (2 hours) Thermodynamics of the atmosphere. Instability and convection. Solar and terrestrial radiation. Radiative transfer. Radiation budgets.

**ATOC 621 PHYSICAL METEOROLOGY 2.** (3) (2 hours) Atmospheric aerosols, nucleation of water and ice. Formation and growth of cloud droplets and ice crystals. Initiation of precipitation. Severe storms and hail. Weather modification. Numerical cloud models.

● **ATOC 626 ATMOSPHERIC/OCEANIC REMOTE SENSING.** (3) (3 hours)

**ATOC 666 TOPICS IN OCEAN CIRCULATION.** (3) (3 hours) Recent observations of mesoscale and large-scale ocean circulation. Inverse methods and their application to tracer distributions and deep ocean circulation. Review of modern theoretical developments such as geostrophic turbulence, homogenization of potential vorticity, ventilated thermoclines, wind and buoyancy driven ocean circulation models, and coupled ice-ocean circulation models.

**ATOC 670 READING COURSE: METEOROLOGY 1.** (3) Assigned reading of a specialized topic in meteorology with formal evaluation.

**ATOC 671 READING COURSE: METEOROLOGY 2.** (3) Assigned reading of a specialized topic in meteorology with formal evaluation.

**ATOC 672 READING COURSE: OCEANOGRAPHY 1.** (3) Assigned reading of a specialized topic in oceanography with formal evaluation.

**ATOC 673 READING COURSE: OCEANOGRAPHY 2.** (3) Assigned reading of a specialized topic in oceanography with formal evaluation.

**ATOC 691 MASTER'S THESIS LITERATURE REVIEW.** (3) Review of relevant literature in preparation for the M.Sc. research.

**ATOC 692 MASTER'S THESIS RESEARCH 1.** (6) Independent research under the supervision of the student's M.Sc. supervisor. **May be offered as: ATOC 692N1 and ATOC 692N2.**

**ATOC 693 MASTER'S THESIS RESEARCH 2.** (6) Independent research under the supervision of the student's M.Sc. supervisor. **May be offered as: ATOC 693N1 and ATOC 693N2.**

**ATOC 694 MASTER'S THESIS PROGRESS REPORT AND SEMINAR.** (3) Written report on the M.Sc. research progress and oral presentation of the report in seminar form to staff and students.

**ATOC 695 MASTER'S THESIS RESEARCH 3.** (6) Independent research under the supervision of the student's M.Sc. supervisor.

**ATOC 696 MASTER'S THESIS RESEARCH 4.** (6) Independent research under the supervision of the student's M.Sc. supervisor.

**ATOC 699 MASTER'S THESIS.** (12) Independent research under the supervision of the student's M.Sc. supervisor leading to the M.Sc. thesis.

**May be offered as: ATOC 699N1 and ATOC 699N2.**

**ATOC 700 PH.D. PROPOSAL SEMINAR.** (1)

**ATOC 701 PH.D. COMPREHENSIVE (GENERAL).** (0)

**May be offered as: ATOC 701D1 and ATOC 701D2.**

**ATOC 751D1 SEMINAR: PHYSICAL METEOROLOGY.** (3) (Students must also register for ATOC 751D2) (No credit will be given for this course unless both ATOC 751D1 and ATOC 751D2 are successfully completed in consecutive terms) Seminars on topics in physical meteorology. Students are required to present one or more seminars during the year on their thesis research and to participate actively in the seminars given by others.

**ATOC 751D2 SEMINAR: PHYSICAL METEOROLOGY.** (3) (Prerequisite: ATOC 751D1) (No credit will be given for this course unless both ATOC 751D1 and ATOC 751D2 are successfully completed in consecutive terms)

**ATOC 752D1 ATMOSPHERIC, OCEANIC AND CLIMATE DYNAMICS.** (0.5) (Students must also register for ATOC 752D2) (No credit will be given for this course unless both ATOC 752D1 and ATOC 752D2 are successfully completed in consecutive terms) Seminars on topics in atmospheric, oceanic and climate dynamics. Students are required to present one or more seminars during the year on their thesis research and to participate actively in the seminars given by others.

**ATOC 752D2 ATMOSPHERIC, OCEANIC AND CLIMATE DYNAMICS.** (0.5) (Prerequisite: ATOC 752D1) (No credit will be given for this course unless both ATOC 752D1 and ATOC 752D2 are successfully completed in consecutive terms).

## 8 Biochemistry

Department of Biochemistry  
McIntyre Medical Sciences Building  
3655 Promenade Sir-William-Osler  
Montreal, QC H3G 1Y6  
Canada

### Telephone:

Admissions Information (514) 398-7262

Student Affairs Officer (514) 398-7266

Fax: (514) 398-7384

E-mail: [admissions.biochemistry@mcgill.ca](mailto:admissions.biochemistry@mcgill.ca)

Web site: [www.mcgill.ca/biochemistry](http://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'neil), 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'neil)

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; Maitrise, 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 student-ships 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](http://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

Candidates who have completed their M.Sc. degree may be admitted directly to the Ph.D. program. Candidates who are admitted to the M.Sc. program and who are interested in the Ph.D. may transfer directly to the Ph.D. program after successfully completing the transfer seminar (BIOC 701) and all course requirements. The M.Sc. thesis requirement is then waived.

#### International Applicants

International students whose language of instruction is not English must submit the following documents in order to be considered for admission:

TOEFL: Minimum score of 600 (250 on computer-based test).

GRE: Subject Test in Biochemistry, Cell and Molecular Biology with a minimum score of 550.

### 8.4 Application Procedures

Applications will be considered upon receipt of:

1. application form;
2. curriculum vitae;
3. application fee (\$60);
4. two letters of recommendation from professors;
5. two official transcripts;
6. test results (TOEFL/GRE) if applicable.

All information is to be submitted to the Admissions Officer, Department of Biochemistry. All applicants are encouraged to

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](http://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:

BIOC 696	(3)	Research Seminar
BIOC 697	(9)	Thesis Research 1
BIOC 698	(12)	Thesis Research 2
BIOC 699	(15)	Thesis Research 3

and a minimum 6 credits of course credits, as specified above.

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:

BIOC 701 Research Seminar 1  
BIOC 702 Ph.D. Thesis Proposal  
BIOC 703 Research Seminar 2.

## 8.6 Graduate Courses

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

**Note:** All undergraduate courses administered by the Faculty of Science (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.

**BIOC 503 IMMUNOCHEMISTRY.** (3) (Winter) (Prerequisites: BIOC 311, BIOC 312) This course, presented in lecture format, emphasizes the molecular, genetic and structure function events that occur in the humoral immune response. Interleukins and other mediators of inflammation, a field in which rapid changes are occurring, are discussed. The clinical significance of fundamental biochemical findings is described.

● **BIOC 603 RECENT ADVANCES IN MOLECULAR GENETICS.** (3) (Prerequisites: BIOC 454 and permission of instructor.)

● ★ **BIOC 604 MACROMOLECULAR STRUCTURE.** (3) (Prerequisite: BIOC 450 or equivalent) (Lectures in French and English) (Offered in alternate years – offered in 2002-03)

**BIOC 696 RESEARCH SEMINAR.** (3) (Open to M.Sc. Biochemistry students only.) Compulsory participation in the departmental seminar series. Graded pass/fail, based on participation.

**BIOC 697 THESIS RESEARCH 1.** (9)

**BIOC 698 THESIS RESEARCH 2.** (12)

**BIOC 699 THESIS RESEARCH 3.** (15)

**BIOC 701 RESEARCH SEMINAR 1.** (0) (Biochemistry graduate students) Presentation on original current laboratory research carried out by student.

**BIOC 702 PH.D. THESIS PROPOSAL.** (0) (Biochemistry graduate students) Dissertation presented to Committee.

**BIOC 703 RESEARCH SEMINAR 2.** (0) (Ph.D. students in Biochemistry) Presentation of the planned thesis including central findings and original contribution to knowledge in the field of research.

**EXMD 615 MEMBRANE CARBOHYDRATES.** (3) The structure, function and biosynthesis of glycoproteins, glycolipids and glycoaminoglycans, and the biological role of complex carbohydrates at the cell surface.

### ADVANCED UNDERGRADUATE COURSES

**BIOC 311 METABOLIC BIOCHEMISTRY.** (3) (Fall) (Prerequisites: BIOL 200, BIOL 201 or BIOC 212, CHEM 222) The generation of metabolic energy in higher organisms with an emphasis on its regulation at the molecular, cellular and organ level. Chemical concepts and mechanisms of enzymatic catalysis are also emphasized. Included: selected topics in carbohydrate, lipid and nitrogen metabolism; complex lipid and biological membranes; hormonal signal transduction.

**BIOC 312 BIOCHEMISTRY OF MACROMOLECULES.** (3) (Winter) (Prerequisites: BIOC 311, BIOL 200, BIOL 201 or BIOC 212) Gene expression from the start of transcription to the synthesis of proteins, their modifications and degradation. Topics covered: purine and pyrimidine metabolism; transcription and its regulation; mRNA processing; translation; targeting of proteins to specific cellular sites; protein glycosylation; protein phosphorylation; protein turnover; programmed cell death (apoptosis).

**BIOC 404 BIOPHYSICAL CHEMISTRY.** (3) (Winter) (Prerequisites: CHEM 204, CHEM 214 or equivalent) (Not open to students who have taken 180-404) Hydrodynamic and electrophoretic methods for separation and characterization of macromolecules. Optical

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

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

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

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

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

## 9 Bioethics

For information, write to:

Chair, Master's Specialization in Bioethics  
Biomedical Ethics Unit  
3647 Peel Street  
Montreal, QC H3A 1X1  
Canada

Telephone: (514) 398-6980

Fax: (514) 398-8349

Web site: [www.mcgill.ca/biomedicalethicsunit/masters](http://www.mcgill.ca/biomedicalethicsunit/masters)

### 9.1 Staff

E. Bereza; B.A., M.D., C.M. (McG.), C.C.F.P. (C)

C. Ellis; R.R.T. (VGH), M.A., Ph.D. (Tenn.)

K.C. Glass; A.M. (Chic.), LL.B., B.C.L., D.C.L. (McG.)

N. Gilmore; B.A. (College of the Holy Cross), Ph.D. (Lond.), M.D. (Vt.)

D. Jones; B.A. (Yale), J.D. (Harv.)

L. Turner; B.A. (Winn.), M.A. (Manit.), M.A., Ph.D. (S. Calif.)

### 9.2 Programs Offered

Master's Specialization in Bioethics.

The Master's Specialization in Bioethics is sponsored by the:  
Faculty of Medicine, Department of Experimental Medicine;  
Faculty of Law;  
Faculty of Religious Studies; and  
Faculty of Arts, Department of Philosophy.

Students receive an M.A., LL.M. or M.Sc. degree in the discipline chosen with a specialization in Bioethics.

### 9.3 Admission Requirements

M.D., bachelor's level professional training in a health science, or bachelor's degree in law, philosophy or religious studies. Other students may be considered on an individual basis.

Enrolment is limited to 12 students.

### 9.4 Application Procedures

Applications are made initially through the Biomedical Ethics Unit in the Faculty of Medicine, which administers the program and teaches the core courses.

Applicants must be accepted by the appropriate Faculty, the Bioethics Graduate Studies Advisory Committee, and the Graduate and Postdoctoral Studies Office.

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

### 9.5 Program Requirements

The curriculum is composed of required courses (for 6 credits) offered in the Biomedical Ethics Unit, bioethics courses (3 credits minimum) offered by the base faculty or department and any graduate courses required or accepted by a base faculty for the granting of a Master's degree, for a total of 21 credits. A minimum of 45 credits is required including the thesis.

Registration Requirements: Depending upon the requirements of the base discipline, a minimum of three terms is required for completion of the program, including course work and thesis.

Thesis Supervision: Thesis supervision for students in the specialization is provided by a participating faculty member in the program. Thesis examination will be conducted according to the base discipline and the Graduate and Postdoctoral Studies Office norms.

#### Required Courses – Biomedical Ethics Unit (6 credits)

BIOE 680 (3) Bioethical Theory

BIOE 681 (3) Bioethics Practicum

#### Required Course – base faculty (3 credits)

one of the following:

BIOE 682 (3) Medical Basis of Bioethics

CMPL 642 (3) Law and Health Care

PHIL 543 (3) Seminar: Medical Ethics

RELG 571 (3) Religion and Medicine

#### Complementary Courses (12 credits)

the remaining credits are to be taken in any graduate courses required or accepted by the base faculty for the granting of a Master's degree

#### Thesis Component – Required (24 credits)

BIOE 690 (3) Thesis Literature Survey

BIOE 691 (3) Thesis Research Proposal

BIOE 692 (6) Thesis Research Progress Report

BIOE 693 (12) Thesis

### 9.6 Courses

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

#### Biomedical Ethics Unit Courses

**BIOE 680 BIOETHICAL THEORY.** (3) (Limited enrolment) A survey of some of the main problem areas and common argument forms used in current bioethics. Problem areas include consent, decisions to withhold or withdraw treatment, allocation of scarce resources, research with human subjects and confidentiality.

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 (e.g., intensive care, family practice, clinical ethics committees). In addition, students shall be assigned for the last month of the term to a single intensive placement. Participation in rounds, case discussions, and a weekly seminar.

**BIOE 690 M.Sc. THESIS LITERATURE SURVEY.** (3)

**BIOE 691 M.Sc. THESIS RESEARCH PROPOSAL.** (3)

**BIOE 692 M.Sc. THESIS RESEARCH PROGRESS REPORT.** (6)

**May be offered as: BIOE 692D1 and BIOE 692D2.**

**BIOE 693 M.Sc. THESIS.** (12)

**May be offered as: BIOE 693D1 and BIOE 693D2.**

**BIOE 694 INDEPENDENT STUDIES 3.** (3)

#### Base Faculty Courses

**BIOE 682 MEDICAL BASIS OF BIOETHICS.** (3) (Limited enrolment.)

The seminar examines the medical basis of timely ethical dilemmas in health care. Content includes: clinical concepts of pathogenesis, disease, screening, diagnosis, therapeutic interventions and prognosis; decision-making in clinical care and institutional policy development; organization of health care systems including socialized medicine, public health and institutions providing health care; medical research.

**CMPL 642 LAW AND HEALTH CARE.** (3) (Limited enrolment.) Topics in this seminar will include philosophical and ethical foundations of law as applied in medicine, legal structures and their impact on health care, law and ethics of the health care professions, administrative and legal control of health care systems and other selected issues.

**PHIL 543 SEMINAR: MEDICAL ETHICS.** (3) (Prerequisite: PHIL 343 or written permission of the instructor) An advanced course devoted to a particular philosophical problem as it arises in the context of medical practice or the application of medical technology.

**RELG 571 RELIGION AND MEDICINE.** (3) (Winter) A study of the resources of major world religions (Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism and Shinto) for thinking about ethical issues related to modern medicine, e.g., health, illness, suffering; new reproductive technologies; genetic engineering; euthanasia; palliative care; animal research; transplants.

## 10 Biology

Department of Biology  
Stewart Biology Building  
1205 Avenue Docteur Penfield  
Montreal, QC H3A 1B1  
Canada

Telephone: (514) 398-6400

Fax: (514) 398-5069

E-mail: [gradinfo.biology@mcgill.ca](mailto:gradinfo.biology@mcgill.ca)

Web site: <http://www.mcgill.ca/biology>

Chair — Paul F. Lasko

Chair of Graduate Program — Robert Levine

### 10.1 Staff

#### Emeritus Professors

F. Clarke Fraser; O.C., B.Sc.(Acad.), M.Sc., Ph.D., M.D., C.M.(McG.), D.Sc.(Acad.), F.R.S.C., F.R.C.P.S.(C) (*Molson Emeritus Professor of Genetics*) (joint appoint. with Human Genetics)

Sarah P. Gibbs; A.B., M.S.(C'nell), Ph.D.(Harv.), F.R.S.C. (*Macdonald Emeritus Professor of Botany*)

Jacob Kalf; M.S.A.(Tor.), Ph.D.(Ind.)

John B. Lewis; B.Sc., M.Sc., Ph.D.(McG.)

Gordon A. MacLachlan; B.Sc., M.A.(Sask.), Ph.D.(Man.), F.R.S.C. (*Macdonald Emeritus Professor of Botany*)

Barid B. Mukherjee; B.Sc.(Calc.), M.S.(Brig.Young), Ph.D.(Utah) (*joint appoint. with Human Genetics*)

Rolf O. Sattler; B.Sc.(Tübingen), Ph.D.(Munich), F.R.S.C.

#### Professors

Graham A.C. Bell; B.A., D.Phil.(Oxon), F.R.S.C. (*James McGill Professor*)

Gregory G. Brown; B.Sc.(Notre Dame), Ph.D.(N.Y.)

A. Howard Bussey; B.Sc., Ph.D.(Brist.), F.R.S.C. (*on leave 2003-04*)

Ronald Chase; A.B.(Stan.), Ph.D.(M.I.T.)

Rajinder S. Dhindsa; B.Sc., M.Sc.(Punj.), Ph.D.(Wash.)

Donald L. Kramer; B.Sc.(Boston Coll.), Ph.D.(U.B.C.)

Paul F. Lasko; A.B.(Harv.), Ph.D.(M.I.T.) (*Molson Professor of Genetics*) (joint appoint. with Anatomy & Cell Biology)

Martin J. Lechowicz; B.A.(Mich. St.), M.S., Ph.D.(Wis.) (*on leave Jan.-June 2004*)

Ronald J. Poole; B.Sc., Ph.D.(Birm.)

Rima Rozen; B.Sc.,PhD.(McG.) (*James McGill Professor*)

Daniel J. Schoen; B.Sc., M.Sc.(Mich.), Ph.D.(Calif.) (*Macdonald Professor of Botany*)

#### Associate Professors

Thomas E. Bureau; B.Sc.(Calif), Ph.D.(Texas) (*William Dawson Scholar*)

François Fagotto; Ph.D.(Neuchâtel)

Siegfried Hekimi; M.Sc., Ph.D.(Geneva)

Louis Lefebvre; B.Sc., M.A., Ph.D.(Montr.)

Robert L. Levine; B.Sc.(Brooklyn), M.Sc., Ph.D.(Yale)

Yutaka Nishioka; B.A., M.A.(Tokyo), Ph.D.(Col.)

Gerald S. Pollack; M.A., Ph.D.(Prin.)

Catherine Potvin; B.Sc., M.Sc.(Montr.), Ph.D.(Duke)

Neil M. Price; B.Sc.(U.N.B.), Ph.D.(U.B.C.)

Joseph Rasmussen; B.Sc., M.Sc.(Alta.), Ph.D.(Cal.)

Beat Suter; Dip., Ph.D.(Zur)

#### Assistant Professors

Ehab Abouheif; M.Sc.(C' dia), Ph.D.(Duke)(*on leave 2003-04*)

Joseph Dent; B.Sc.(Mich), Ph.D.(Colo.)

Frédéric Guichard; B.Sc.(Montr.), Ph.D.(Laval)

Christian Hardtke; M.Sc., Ph.D.(Munich)

Andrew Hendry; B.Sc.(Vic.,B.C.) M.Sc., Ph.D.(Wash)

Kevin McCann; B.A.(Dart), M.Sc., Ph.D.(Guelph)

Laura Nilson; B.A.(Colgate), Ph.D.(Yale) (*Canada Research Chair in Developmental Genetics*)

Richard Roy; B.Sc.(Bishop's), Ph.D.(Laval)

Jacalyn Vogel; M.Sc.(E.I.L.L.), Ph.D.(Kansas)

Monique Zetka; B.Sc., Ph.D.(Br. Col.)

#### Associate Members

Salvatore Carbonetto (*Montreal General Hospital*), Hugh Clarke

(*Royal Victoria Hospital*), Pierre Drapeau (*Montreal General Hospital*), Robert Dunn (*Montreal General Hospital*),

Michael Ferns (*Montreal General Hospital*), David Green

(*Redpath Museum*), Kenneth Hastings (*Montreal Neurological Ins.*),

Paul Holland (*Montreal Neurological Inst.*), Roberta Palmour

(*Allan Memorial Institute*), Anthony Ricciardi (*Redpath Museum*),

David Rosenblatt (*Royal Victoria Hospital*), Guy Rouleau

(*Montreal General Hospital*), Charles R. Scriver (*Montreal Children's Hospital Research Inst.*),

Teruko Taketo (*Royal Victoria Hospital*), Harriet S. Tenenhouse (*Montreal Children's Hospital Research Inst.*),

David Y. Thomas (*Biochemistry Dept.*)

#### Adjunct Professors

Eldredge Bermingham (STRI), Wing Y. Cheung (DNA Landmarks),

Wayne Hunte (U. West Indies), Benoit S. Landry (DNA Landmarks),

William F. Laurance (STRI),

Malcom S. Whiteway (Bio Tech Inst.)

## 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 CGPA of 3.2/4.0 for the last two full-time academic years. Graduate Record Examination (GRE) scores are not required, but may be submitted. The Test of English as a Foreign Language (TOEFL) is required of students who have graduated from a non-English language university outside of Canada. A score of 550 on the paper-based TOEFL (213 on the computer-based test) or 6.5 on IELTS, is the minimum standard for admission.

Admission is based on an evaluation by the Graduate Training Committee and on acceptance by a research director who can provide adequate funding for personal and research expenses. Prospective graduate students are encouraged to contact staff members with whom they wish to study before applying for admission.

## 10.4 Application Procedures

Application to the graduate program in Biology may be made on a paper application form or an on-line Web application form (a direct link to the on-line form is on the Department Web site). The paper form can be obtained directly from the Graduate Admissions Secretary or printed from the Biology Department Web site.

All applicants should read the academic faculty and admission procedure sections on either the separate paper handouts or the Biology Department Web site before completing the application form. These guidelines contain specific information on the application process, summaries of the research areas of our staff and contact information.

Deadlines for applications and all supporting documents are March 1 for September admission (January 15 for international applicants) and October 15 for January admission (August 15 for international applicants). If application materials are received after these dates, it may be necessary to delay review of the applicant's file until the following admittance period. All inquiries per-

to admission procedures should be directed to the Graduate Admissions Secretary.

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

## 10.5 Program Requirements

The graduate program of each student is established and regularly evaluated by a three-member supervisory committee appointed by the Graduate Training Committee and chaired by the student's thesis supervisor.

All graduate students are required to participate regularly in the various seminar series and journal clubs offered by the Department.

### M.Sc. REQUIREMENTS (45 credits)

**Length of Program** – Three full-time terms of resident study at McGill University is the minimum time requirement to complete the Master's degree. The normal and expected duration is two years.

**Course Requirements** – Forty-five credits are required for the M.Sc. degree. Students must complete the courses BIOL 697, BIOL 698 and BIOL 699 (Master's Thesis Research 1, 2, 3). The research courses each carry a credit weight of 13 credits. In addition, six course credits are required and may be taken in Biology or in other departments and must be numbered 500 or higher. Additional course work may be required if the student's background is insufficient. A graduate pass (B- or better) is mandatory for all courses required for the M.Sc. degree.

**Thesis** – In Biology, the M.Sc. degree is considered to be a research degree and the candidate must present a thesis which should contain original contributions to knowledge.

### M.Sc. – NEOTROPICAL ENVIRONMENT REQUIREMENTS (48 credits)

**Length of Program** – Three full-time terms of resident study at McGill University is the minimum time requirement to complete the Master's degree. The normal and expected duration is two years.

**Course Requirements** – Forty-eight credits are required for this M.Sc. degree. Students must complete the courses BIOL 697, BIOL 698 and BIOL 699 (Master's Thesis Research 1, 2, 3). The research courses each carry a credit weight of 13 credits. In addition, six course credits are required from ENVR 610 and BIOL 640. Three credits must be chosen from POLI 644, SOCI 565, ENVR 611, ENVR 612, ENVR 680, BIOL 553, BIOL 641, GEOG 498, AGRI 550. Additional course work may be required if the student's background is insufficient. A graduate pass (B- or better) is mandatory for all courses required for the M.Sc. degree.

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

**Thesis** – In Biology, the M.Sc. degree is considered to be a research degree and the candidate must present a thesis which should contain original contributions to knowledge.

**Transfer from M.Sc to Ph.D. Program** – The student's Supervisory Committee may recommend to the Graduate Training Committee that the student be permitted to transfer to the Ph.D. program. This is normally done at the end of the first year of the Master's program. Students who transfer into the Ph.D. program are required to take their Ph.D. Qualifying Examination within eight months of the transfer.

### Ph.D. REQUIREMENTS

**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. 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.

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## 10.6 Courses

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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) Directed training in selected methods used in areas of current interest in biological research. Intended for individuals or classes working in selected areas under the supervision of one or more staff members. Form and content are flexible to allow the Department to meet specific student demands and needs. Each course is arranged by consultation with individual staff.

**BIOL 656 LABORATORY PROJECTS AND TECHNIQUES 2.** (3) Directed training in selected methods used in areas of current interest in biological research. Intended for individuals or classes working in selected areas under the supervision of one or more staff members. Form and content are flexible to allow the Department to meet specific student demands and needs. Each course is arranged by consultation with individual staff.

**BIOL 697 MASTER'S THESIS RESEARCH 1.** (13) Independent research work under the direction of the Thesis Supervisor and the Supervisory Committee.

**BIOL 698 MASTER'S THESIS RESEARCH 2.** (13) Independent research work under the direction of the Thesis Supervisor and the Supervisory Committee.

**BIOL 699 MASTER'S THESIS RESEARCH 3.** (13) Independent research work under the direction of the Thesis Supervisor and the Supervisory Committee.

**BIOL 700 DOCTORAL QUALIFYING EXAMINATION.** (0) The oral Qualifying Examination is a formal evaluation of the candidate's ability to proceed to the attainment of the Ph.D. Candidates must submit a thesis proposal in advance of the exam.

**BIOL 702 PH.D. SEMINAR.** (6) Doctoral candidates are required to give a public oral presentation of their major results before submitting a thesis.

#### SPECIFIC COURSES

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

★ **BIOL 505 DIVERSITY AND SYSTEMATICS SEMINAR.** (3) (Winter) (3 hours seminar) (Prerequisites: BIOL 304, BIOL 305, or permission) A course dealing in depth with a particular aspect of biological diversity and/or systematics. Topics may include the systematics of a particular taxon, issues in biodiversity, systematics theory and practice, etc. The class will discuss aspects of the chosen topic and prepare individual seminar reports.

**BIOL 516 GENETICS OF DEVELOPMENT.** (3) (Winter) (3 hours lecture) (Prerequisites: BIOL 202, BIOL 300, BIOL 303; permission) (Not open to students who have taken 177-416) This course aims to examine problems, theories, and experimental evidence on several concepts of mammalian developmental processes at molecular to organogenesis levels. Most topics are in the mouse model system, where various techniques for genetic manipulation are available.

**BIOL 518 EUKARYOTIC CELL GENETICS.** (3) (Winter) (2 hours seminar) (Prerequisite: BIOL 300 and permission) This course is designed for advanced undergraduate and graduate students. Readings from recent journal articles and reviews. Variable topics, including: cell differentiation, function of oncogenes and anti-oncogenes, growth regulation and cell cycle, gene transfer, recombination, mobile genetic elements, regulation of gene expression, cellular and viral replication, signal transduction.

**BIOL 520 GENE ACTIVITY IN DEVELOPMENT.** (3) (Winter) (3 hours lecture and discussion) (Prerequisites: BIOL 300 and BIOL 303 or permission) (Not open to students who have taken 177-420) An analysis of the role and regulation of gene expression in several models of eukaryotic development. The emphasis will be on critical evaluation of recent literature concerned with molecular or genetic approaches to the problems of cellular differentiation and determination. Recent research reports will be discussed in conferences and analyzed in written critiques.

**BIOL 524 TOPICS IN MOLECULAR BIOLOGY.** (3) (Fall) (Prerequisite: BIOL 300, BIOL 303 or permission) Recent literature in the fields of molecular genetics and molecular biology. Topics include: signal transduction, cell function, genetic diseases in eukaryotes.

★ **BIOL 530 NEURAL BASIS OF BEHAVIOUR.** (3) (Winter) (1 hour lecture, 2 hours seminar) (Prerequisite: BIOL 306 or PHGY 311 or PSYC 308) (Not open to students who have taken 177-430) This course examines neural mechanisms underlying behaviour. Topics will be introduced by a lecture, supplemented by a review article. This will be followed by student seminars and/or discussions. Topics will vary according to current literature, but will likely include communication, visual behaviour, escape, orientation, neurogenetics and locomotion.

**BIOL 531 NEUROBIOLOGY LEARNING MEMORY.** (3) (Fall) (3 hours lecture and discussion) (Prerequisite: BIOL 306 or permission) (Not open to students who have taken 177-431) Properties of nerve cells that are responsible for learning and memory. Recent advances in the understanding of neurophysiological, biochemical and structural processes relevant to neural plasticity. Emphasis on a few selected model systems involving both vertebrate and invertebrate animals.

**BIOL 532 DEVELOPMENTAL NEUROBIOLOGY SEMINAR.** (3) (Winter) (1 hour lecture, 2 hours seminar) (Prerequisites: BIOL 303 and BIOL 306 or permission) Discussions of all aspects of nervous system development including pattern formation, cell lineage, pathfinding and targetting by growing axons, and neuronal regeneration. The basis for these discussions will be recent research papers and other assigned readings.

**BIOL 540 ECOLOGY OF SPECIES INVASIONS.** (3) (Winter) (3 hours lecture) (Prerequisite: BIOL 208 or permission of instructor) (Not open to U1 or U2 students) (Not open to students who are taking or have taken ENVR 540.) Causes and consequences of invasion, as well as risk assessment methods and management strategies for dealing with this global problem.

★ **BIOL 544 GENETIC BASIS OF LIFE SPAN.** (3) (Fall) (1 hour lecture, 2 hours seminar) (Prerequisites: BIOL 202, BIOL 300; BIOL 303 recommended or permission) (Not open to students who have taken 177-444) The course will consider how gene action is determining the duration of life in various organisms focusing on the strengths and limitations of the genetic approach. The course will focus particularly on model organisms such as yeast, *Caenorhabditis*, *Drosophila* and mouse, as well as on the characterization of long-lived mutants.

● **BIOL 551 MOLECULAR BIOLOGY: CELL CYCLE.** (3) (Fall) (3 hours lecture) (Prerequisites: BIOL 200, BIOL 201, BIOL 300) (Not open to students who have taken 177-451)

**BIOL 553 NEOTROPICAL ENVIRONMENTS.** (3) (Winter) (24 hours lecture and 36 hours field work over a 4-week period) (Prerequisites: HISP 218, MATH 203, and BIOL 208/308, or equivalents, and permission of Program Coordinator.) (Corequisites: ENVR 451, GEOG 498 and ABEN 550.) (Not open to students who have taken BIOL 453) (Restriction: location in Panama. Students must register for a full semester of studies in Panama) Ecology revisited in view of tropical conditions. Exploring species richness. Sampling and measuring biodiversity. Conservation status of ecosystems, communities and species. Indigenous knowledge.

**BIOL 570 ADVANCED SEMINAR IN EVOLUTION.** (3) (Winter) (3 hours seminar) (Open to undergraduates by permission) Detailed analysis of a topic in evolutionary biology, involving substantial original research.

★ **BIOL 572 MOLECULAR EVOLUTION.** (3) (Fall) (3 hours lecture/seminar) (Prerequisite: BIOL 300) (Not open to students who have taken 177-472) Course is concerned with the rates and patterns of change in the genetic material (DNA sequences) and its products (proteins), through evolutionary time. The emphasis will be on the processes responsible for evolutionary change at the molecular level, such as selective neutrality, gene duplication, shuffling of exons, and transposition.

● ★ **BIOL 588 MOLECULAR/CELLULAR NEUROBIOLOGY.** (3) (Fall) (1 1/2 hours lecture, 1 1/2 hours seminar) (Prerequisite: BIOL 300 and BIOL 306 or permission)

● **BIOL 632 LIMNOLOGY.** (3) (2 hours lecture; 3 hours laboratory) (Prerequisites: BIOL 206 and/or permission)

★ **BIOL 640 TROPICAL BIOLOGY AND CONSERVATION.** (3) (Restricted to students enrolled in Neotropical Environment Option (NEO) or permission of the instructor) Long-term research at the Smithsonian Tropical Research Institute will be organized and synthesized to examine historical assembly and ecological maintenance of tropical communities. This synthesis will draw on phylogenetic concepts for historical insight and will examine the probable resilience of these communities to global change, pollution and biodiversity loss.

**BIOL 641 ISSUES IN TROPICAL BIOLOGY.** (3) (Course will only be offered if enrolment is five students or more. Enrolment in the Neotropical Environment Option (NEO) or permission of the instructor) Advanced interdisciplinary topics relevant to environmental work in Latin America including tropical marine environmental physiology encompassing issues of pollution and toxicity, global climate change from an ecosystem and economical perspective, evolutionary ecology of tropical communities as related to the maintenance of species diversity.

## 11 Biomedical Engineering

Department of Biomedical Engineering  
Duff Medical Building  
3775 University Street  
Montreal, QC H3A 2B4  
Canada

Telephone: (514) 398-6736  
Fax: (514) 398-7461  
Web site: [www.bmed.mcgill.ca](http://www.bmed.mcgill.ca)

Chair — R.E. Kearney

### 11.1 Staff

#### Professors

T.M.S. Chang; B.Sc., M.D., C.M., Ph.D.(McG.), F.R.C.P.(C)  
(joint appoint. with Physiology)

A.C. Evans; B.Sc.(Liv.), M.Sc.(Sur.), Ph.D.(Leeds) (joint appoint.  
with Neurology and Neurosurgery)

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. Boby; 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*)

#### Assistant Professors

D.L. Collins; B.Sc., M.Eng, Ph.D.(McG.) (*joint appoint. with Neurology and Neurosurgery*)  
 S. Prakash, B.Sc., M.Sc.(BHU-India), Ph.D.(McG.)  
 M. Tabrizian, B.Sc.(Iran), M.Sc., Ph.D.(PMC-France), M.B.A.(HEC) (*joint appoint. with Dentistry*)

#### Associate Members

G. Baroud (*Surgery*), K. Cullen (*Physiology*), S. De Serres (*Physical and Occupational Therapy*), J. Gotman (*Neurology and Neurosurgery*), R. Gunn (*Neurology and Neurosurgery*), R. Mongrain (*Mechanical Engineering*), B.N. Segal (*Otolaryngology*), T. Steffen (*Surgery*), C. Thompson (*Neurology and Neurosurgery*)

#### Adjunct Professors

J.H.T. Bates (VT), W.F. Decraemer (U. Antwerp), I.W. Hunter (M.I.T.), T.M. Peters (U.W.O.), P.L. Weiss (Hebrew)

#### Research Associates

C. Baker, D. Guitton, A. Katsarkas

## 11.2 Programs Offered

The Department offers a graduate training program leading to Master's (M.Eng.) and Ph.D. degrees in Biomedical Engineering.

It provides instruction and opportunities for interdisciplinary research in the application of engineering, mathematics, and the physical sciences to problems in medicine and the life sciences. Courses are offered for graduate students in the life sciences and in engineering and the physical sciences.

Excellent laboratory facilities for basic and applied research are available in the Department and in the laboratories of associated staff located elsewhere in the Medical Faculty. The Department operates a network of high performance workstations and well-equipped mechanical and electronics workshops.

Basic research in the Department concentrates on the application of quantitative engineering analysis methods to basic biomedical research problems. Currently active areas of research include: neuromuscular and postural control, muscle mechanics, the vestibular system, oculomotor control, the auditory system, joint prosthetics, biomaterials, artificial cells and organs, and medical imaging. Staff members are also active in more applied research related to the development of quantitative analysis tools and instruments for biomedical research. Areas of activity here include: signal analysis, system identification, modeling, simulation and parameter estimation, image processing, pattern recognition, ultrasound, and biorobotics.

## 11.3 Admission Requirements

See minimum admission requirements in Section 5 of the General Information section of the *Graduate and Postdoctoral Studies Calendar*.

## 11.4 Application Procedures

Please address enquiries directly to the Department.

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

## 11.5 Program Requirements

Master's degrees (M.Eng.) require students to complete a minimum of 45 credits (24 thesis credits and 21 graduate course credits).

Graduate students may also be registered through departments of Medicine, Science and Engineering, and must then fulfill the requirements for advanced degrees imposed by their respective departments.

In addition, all students are required, through course work and independent study, to achieve a degree of inter-disciplinary competence appropriate to their area of specialization.

## 11.6 Courses for Higher Degrees

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

**BMDE 500D1 SEMINARS IN BIOMEDICAL ENGINEERING.** (1.5) (Students must also register for BMDE 500D2) (No credit will be given for this course unless both BMDE 500D1 and BMDE 500D2 are successfully completed in consecutive terms)

**BMDE 500D2 SEMINARS IN BIOMEDICAL ENGINEERING.** (1.5) (Prerequisite: BMDE 500D1) (No credit will be given for this course unless both BMDE 500D1 and BMDE 500D2 are successfully completed in consecutive terms)

**BMDE 501 SELECTED TOPICS IN BIOMEDICAL ENGINEERING.** (3) (3-0-6) An overview of how techniques from engineering and the physical sciences are applied to the study of selected physiological systems and biological signals. Using specific biological examples, systems will be studied using: signal or finite-element analysis, system and identification, modelling and simulation, computer control of experiments and data acquisition.

**BMDE 502 BME MODELLING AND IDENTIFICATION.** (3) (Prerequisites: Undergraduate basic statistics and: either BMDE 519, or Signals and Systems (e.g., ECSE 303 & ECSE 304) or equivalent) Methodologies in biological control systems or distributed multi-dimensional biological processes, with interactive sessions using real biological data in a Matlab environment. System themes include parametric vs non-parametric system representations; linear/non-linear; noise, transients and time variation; and relevant identification approaches in continuous and discrete time formulations.

**BMDE 503 BIOMEDICAL INSTRUMENTATION.** (3) (2-1-6) A review of the principles and practice of making biological measurements in the laboratory, including theory of linear systems, data sampling, computer interfaces, basic electronic circuit design and machining. Laboratory facilities allow students to experiment with computer-based data acquisition.

**BMDE 504 BIOMATERIALS AND BIOPERFORMANCE.** (3) (3-0-0) (Restricted to graduate and final-year undergraduate students from physical, biological and medical science, and engineering.) Biological and synthetic biomaterials, medical devices, and the issues related to their bioperformance. The physicochemical characteristics of biomaterials in relation to their biocompatibility and sterilization.

**BMDE 505 CELL AND TISSUE ENGINEERING.** (3) (1.5 hours lecture/1.5 hours seminar per week) (Restricted to graduate and final year undergraduate students from physical, biological and medical science, and engineering.) Application of the principles of engineering, physical, and biological sciences to modify and create cells and tissues for therapeutic applications will be discussed, as well as the industrial perspective and related ethical issues.

**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.** (3)

**BMDE 694 THESIS RESEARCH 5.** (3)

**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.

## 12 Bioresource Engineering

Department of Bioresource Engineering  
Macdonald Campus

21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue, QC H9X 3V9  
Canada

Telephone: (514) 398-7774

Fax: (514) 398-8387

E-mail: [raghavan@macdonald.mcgill.ca](mailto:raghavan@macdonald.mcgill.ca)

Web site: [www.mcgill.ca/agreng](http://www.mcgill.ca/agreng)

Chair — G.S.V. Raghavan

### 12.1 Staff

*Emeritus Professor*

R.S. Broughton; B.S.A., B.A.Sc.(Tor.), S.M.(M.I.T.), Ph.D.(McG.), LL.D.(Dal.)

*Professors*

S. Barrington; B.Sc.(Agr. Eng.), Ph.D.(McG.)

R. Kok; B.E.Sc., Ph.D.(W.Ont.)

C.A. Madramootoo; B.Sc.(Agr. Eng.), M.Sc., Ph.D.(McG.) (*James McGill Professor*)

E. McKyes; B.Eng., M.Eng., Ph.D.(McG.)

S.O. Prasher; B.Tech, M.Tech.(Punj.), Ph.D.(Br.Col.) (*James McGill Professor*)

G.S.V. Raghavan; B.Eng.(B'lore), M.Sc.(Guelph), Ph.D.(Colo.St.) (*James McGill Professor*)

*Associate Professors*

E.R. Norris; B.S.A.(Tor.), M.Sc.(Guelph), Ph.D.(Mich. St.)

J. Sheppard; B.Sc.(Eng.)(Guelph), M.E.Sc.(W.Ont.), Ph.D.(McG.)

*Brace Centre for Water Resources Management*

*Associate Professor*

R.B. Bonnell; B.Sc.(Geo.), B.Sc.(Agr.Eng.), M.Sc., Ph.D.(McG.)

*Assistant Professors*

M.O. Ngadi; B.Eng.(Agr.Eng.), M.A.Sc., Ph.D.(Dal.Tech.)

N. Wang; B.Eng.(E.E.), M.Eng.(I.E.) (Asian Institute of Technology), M.Sc.(E.E.), Ph.D (Kansas St.)

*Auxiliary Professors*

N.B. McLaughlin, B. Paterson, A. Shady, G. Sunahara,

C. Vigneault

*Research Associates*

P. Enright, V. Orsat, V. Sosle

### 12.2 Programs Offered

The Department offers M.Sc. and Ph.D. research programs in various areas of biosystem and bioresource engineering including: plant and animal environments; ecological engineering (ecosystem modelling, design, management, and remediation); water resources management (hydrology, irrigation, drainage, water quality); agricultural machinery, mechatronics and robotics; food engineering and food processing; postharvest technology; waste management and protection of the environment; artificial intelligence.

The interdisciplinary nature of agricultural and biosystems engineering often requires candidates for higher degrees to work in association with, or attend courses given by, a number of other departments at both the McGill University Macdonald Campus and the Downtown Campus.

### 12.3 Admission Requirements

Candidates for M.Sc. and Ph.D. degrees should indicate in some detail their fields of special interest when applying for admission. An equivalent cumulative grade point average of 3.0/4.0 (second class-upper division) or 3.2/4.0 during the last two years of full-time university study is required at the Bachelor's level. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program. Experience after the undergraduate degree is an additional asset.

### 12.4 Application Procedures

Applicants for graduate studies through academic units in the Faculty of Agricultural and Environmental Sciences must forward supporting documents to:

Student Affairs Office (Graduate Studies)  
Macdonald Campus of McGill University  
21,111 Lakeshore  
Sainte-Anne-de-Bellevue, QC H9X 3V9  
Canada

Telephone: (514) 398-7925

Fax: (514) 398-7968

E-mail: [grad@macdonald.mcgill.ca](mailto:grad@macdonald.mcgill.ca)

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](http://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.

**Financial aid is very limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application.**

Acceptance to all programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support. Normally, a student will not be accepted unless adequate financial support can be provided by the student and/or the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships or other funds.

**Qualifying Students** – Some applicants whose academic degrees and standing entitle them to serious consideration for admission to graduate studies, but who are considered inadequately prepared in the subject selected may be admitted to a *Qualifying Program* if they have met the Graduate and Postdoctoral Studies Office minimum CGPA of 3.0/4.0. The course(s) to be taken in a *Qualifying Program* will be prescribed by the academic unit concerned. *Qualifying students* are registered in graduate studies, **but not as candidates for a degree**. Only one qualifying year is permitted. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

## 12.5 Program Requirements

### M.Sc.

At least 12 months of full-time study are required for this degree. A student may complete the requirements by obtaining 46 credits under the requirements of the thesis or non-thesis options.

### M.Sc. Thesis Option

This option for the M.Sc. degree is oriented towards individuals who intend to develop a career in agricultural and biosystems engineering research. The requirements for this option are:

1. completion and final acceptance of a supervised research thesis in one of the areas described above, according to the regulations of the Graduate and Postdoctoral Studies Office. This work is represented by courses M.Sc. Thesis 1 through 8, described below and equivalent to four credits each, for a total of 32 credits allotted to thesis work (ABEN 691 to ABEN 698).
2. 12 credits of postgraduate course work in agricultural and biosystems engineering and other fields to be determined in consultation with the research director. It is required that the candidate include the scientific publication course in this category of credits.
3. Participation in graduate seminar during two terms.

### M.Sc. Thesis Option – Neotropical Environment

The requirements for this option are:

1. completion and final acceptance of a supervised research thesis according to the regulations of the Graduate and Postdoctoral Studies Office. This work is represented by courses M.Sc. Thesis 1 through 8, described below and equivalent to four credits each, for a total of 32 credits allotted to thesis work (ABEN 691 to ABEN 698).
2. 11 credits of required courses: ABEN 651, ABEN 652, ABEN 699, BIOL 640, and ENVR 610.
3. 3 credits chosen from AGRI 550, BIOL 553, BIOL 641, ENVR 611, ENVR 612, ENVR 680, GEOG 498, POLI 644, SOCI 565.
4. Participation in the MSE-Panama Symposium presentation in Montreal is required.

### M.Sc. Applied – Non-thesis Option

The non-thesis option is aimed towards individuals already employed in industry or seeking to improve their skills in specific areas (soil and water/structures and environment/waste management/and environment protection/post harvest technology/food process engineering/environmental engineering) in order to enter the engineering profession at a higher level. The requirements for a candidate registering for this option are:

1. a minimum of two project courses of 6 credits each (ABEN 671 and ABEN 672).
2. 31 additional credits in graduate courses from the Bioresource Engineering Department or courses from other departments

relevant to project topics which must be approved by the academic advisor. Selection of courses in each area can follow the format of the example shown below for the Food Process Engineering area: this option is offered under the regulations of the non-thesis degree in cooperation with the Department of Food Science and Agricultural Chemistry and the Department of Chemical Engineering. The candidate is expected to obtain 12 of the 31 non-project credits in the cooperating departments. The division of these 12 credits between the two departments should be decided between the candidate and the supervisors of the projects undertaken. In some cases, necessary senior undergraduate courses in the collaborative departments can be taken for credit towards the M.Sc., Applied.

3. participation in graduate seminar during two terms.

Candidates must meet the qualifications of a professional engineer either before or during their M.Sc., Applied program.

Each candidate for this option is expected to establish and maintain contact with his/her academic advisor in the Department of Bioresource Engineering some time before registration in order to clarify objectives, investigate project possibilities and plan a program of study.

#### **M.Sc. Applied – Non-thesis Option – Neotropical Environment**

The program consists of a minimum of 45 credits. The requirements for a candidate registering for this option are:

1. 20 credits of required courses: ABEN 651, ABEN 652, ABEN 671, ABEN 672, BIOL 640 and ENVR 610.
2. 3 credits must be chosen from AGRI 550, BIOL 553, BIOL 641, ENVR 611, ENVR 612, ENVR 680, GEOG 498, POLI 644, SOCI 565.
3. 22 additional credits in graduate courses chosen in consultation with the academic advisor.
4. Participation in the MSE-Panama Symposium presentation in Montreal is required.

#### **M.Sc. Applied in Environmental Engineering**

The program consists of a minimum of 45 credits, of which, depending on the student's home department, a minimum of 5 and a maximum of 15 may be allotted to the project. The balance is earned by coursework, of which one to three approved undergraduate (below 500-level) courses are allowed. Candidates must possess a Bachelor's degree in engineering with superior academic achievement (a minimum cumulative grade point average of 3.0 out of a possible 4.0).

To complete the program, students must:

1. complete four required core courses;
2. complete a minimum of two engineering courses;
3. complete a minimum of two non-engineering courses (each course should be chosen from a different department);
4. complete a design or research project of 5 to 15 credits;
5. complete all the remaining courses (to a total of at least 45 credits) as required in the student's departmental program (these courses must be approved by the student's Academic Advisor); and
6. obtain a grade of B- (or 65%) or better in all required and approved courses.

#### **Ph.D.**

Candidates for the Ph.D. degree will normally register for the M.Sc. degree in the first instance. In cases where the research work is proceeding very satisfactorily, or where the equivalent of the M.Sc. degree has been completed, candidates may be permitted to proceed directly to the Ph.D. degree.

Courses of study selected for a Ph.D. program will depend on the existing academic qualifications of the candidate and on those needed for effective pursuit of research in the chosen field. Candidates are encouraged to take an additional course of study of their own choice in some field of the humanities, sciences or engineering not directly related to their research. The program will be established by consultation of the candidate with a committee that

will include the Research Director and at least one other professor.

A comprehensive examination, ABEN 701, will be taken either late in the first, or early in the second, registration year to qualify to proceed to the completion of the Ph.D. degree.

Participation in graduate seminar during four terms.

#### **Ph.D. – Neotropical Environment**

The requirements for a candidate registering for this option are: 6 credits of required courses: ENVR 610 and BIOL 640.

3 credits chosen from AGRI 550, BIOL 553, BIOL 641, ENVR 611, ENVR 612, ENVR 680, GEOG 498, POLI 644, SOCI 565.

Participation in the MSE-Panama Symposium presentation in Montreal.

Participation in graduate seminar during four terms.

A comprehensive examination, ABEN 701, will be taken either late in the first, or early in the second, registration year to qualify to proceed to the completion of the Ph.D. degree.

## **12.6 Courses**

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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 taught only in alternate years.

● Denotes courses not offered in 2003-04.

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

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

**ABEN 506 ADVANCES IN DRAINAGE MANAGEMENT.** (3) (3 weeks intensive course) Land drainage in relation to soils and crops. Design of regional drainage systems, stability of ditches, ice problems. Design of subsurface drainage systems. Theories of flow into drain tubes. Hydraulics of wells. Drainage of irrigated lands. Water table control.

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

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

**ABEN 515 COMPUTER MODELS IN DRAINAGE ENGINEERING.** (3) (3 lectures and one 3-hour lab) A review of computer simulation models of designing subsurface drainage systems. Use of CAD systems in design and drafting drainage plans. In depth discussion and applications of DRAINMOD, a microcomputer based model for designing and evaluating drainage water management systems for soils with high water tables.

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

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

**ABEN 519 ADVANCED FOOD ENGINEERING.** (3) (3 lectures and one 2-hour lab) (Prerequisites: ABEN 325 and MECH 426, or permission of instructor) Advanced topics in food engineering. Concepts of mathematical modeling and research methodologies in food engineering. Topics include heat and mass transfer in food systems, packaging and distribution of food products, thermal and non-thermal processing, rheology and kinetics of food transformations.

● ★ **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) Modelling, 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 - STORAGE.** (3) (3 hours lectures)

**ABEN 623 PROPOSAL PREPARATION.** (3) (3 hours conferences) Critiques of proposals prepared by others. Preparation and defense of draft proposals for funding agencies.

**ABEN 651 DEPARTMENTAL SEMINAR M.Sc. 1.** (1) To give seminars and participate in discussions.

May be offered as: **ABEN 651D1** and **ABEN 651D2.**

**ABEN 652 DEPARTMENTAL SEMINAR M.Sc. 2.** (1) To give seminars and participate in discussions.

● **ABEN 653 DEPARTMENTAL SEMINAR M.Sc. 3.** (1)

**ABEN 671 PROJECT 1.** (6) Prepare project outline, execute and report. This project relates to the M.Sc. (Applied) degree.

May be offered as: **ABEN 671D1** and **ABEN 671D2.**

**ABEN 672 PROJECT 2.** (6) Prepare project outline, execute and report. This project relates to the M.Sc. (Applied) degree.

May be offered as: **ABEN 672D1** and **ABEN 672D2.**

**ABEN 691 M.Sc. THESIS 1.** (4) Problem definition and literature Review.

**ABEN 692 M.Sc. THESIS 2.** (4)

**ABEN 693 M.Sc. THESIS 3.** (4) Methodology development.

**ABEN 694 M.Sc. THESIS 4.** (4) Experimentation 1.

**ABEN 695 M.Sc. THESIS 5.** (4) Experimentation 2.

**ABEN 696 M.Sc. THESIS 6.** (4) Data analysis.

**ABEN 697 M.Sc. THESIS 7.** (4) Draft thesis preparation.

**ABEN 698 M.Sc. THESIS 8.** (4) Thesis completion and acceptance.

**ABEN 699 SCIENTIFIC PUBLICATION.** (3) (Periodic conferences) Review and critique papers that are published in field of the candidate. Prepare draft paper(s) following the format of leading journals in field of study undertaken.

**ABEN 701 Ph.D. COMPREHENSIVE EXAMINATION.** (0)

May be offered as: **ABEN 701D1** and **ABEN 701D2.**

**ABEN 702 SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING 2.**

(3) (2 conferences, either term) Advanced level laboratory, field and library studies and reports on special problems related to agricultural and biosystems engineering which are not covered in regular course work. Designed for doctoral level students with experience in postgraduate studies.

**ABEN 751 DEPARTMENTAL SEMINAR Ph.D. 1.** (0) To give seminars and participate in discussions.

**ABEN 752 DEPARTMENTAL SEMINAR Ph.D. 2.** (0) To give seminars and participate in discussions.

**ABEN 753 DEPARTMENTAL SEMINAR Ph.D. 3.** (0) To give seminars and participate in discussion.

**ABEN 754 DEPARTMENTAL SEMINAR Ph.D. 4.** (0) To give seminars and participate in discussions.

● **ABEN 755 DEPARTMENTAL SEMINAR Ph.D. 5.** (0)

## 13 Chemical Engineering

Department of Chemical Engineering  
M.H. Wong Building  
3610 University Street  
Montreal, QC H3A 2B2  
Canada

Telephone: (514) 398-4494

Fax: (514) 398-6678

E-mail: [info.chemeng@mcgill.ca](mailto:info.chemeng@mcgill.ca)

Web site: [www.mcgill.ca/chemeng](http://www.mcgill.ca/chemeng)

Chair — R.J. Munz

### 13.1 Staff

#### Post-Retirement

J.-M. Charrier; Dipl.Ing., (E.N.S.A.M. Paris), M.S., Ph.D.(Akron), Eng.

W.J.M. Douglas; B.Sc.(Queen's), M.S.E., Ph.D.(Mich.)

#### Professors

D.G. Cooper; B.Sc., Ph.D.(Tor.)

J.M. Dealy; B.S.(Kansas), M.S.E., Ph.D.(Mich.), Eng.

M.R. Kamal; B.S.(Ill.), M.S., Ph.D.(Carn.-Mellon), Eng.

R.J. Munz; B.A.Sc., M.A.Sc.(Wat.), Ph.D.(McG.), Eng.

A.D. Rey; B.Ch.E.(C.C.N.Y.), Ph.D.(Calif.) (*James McGill Professor*)

J.H. Vera; B.Mat.(Chile), Ing.Quim.(U.T.E.), M.S.(Calif.), Dr.Ing.(Santa Maria), Eng.

B. Volesky; M.Sc.(Czech. Tech. Univ.), Ph.D.(W.Ont.)

M.E. Weber; B.S.E.(Prin.), Sc.D.(M.I.T.), P.Eng.

#### Associate Professors

D. Berk; B.Sc.(Bosphorus), M.E.Sc.(W.Ont.), Ph.D.(Calg.), P.Eng.

J.-L. Meunier; D.Ing.(E.P.F.L.), M.Sc., Ph.D.(I.N.R.S.), Eng.

#### Assistant Professors

W.A. Brown; B.Eng, M.Eng., Ph.D.(McG.), P. Eng.

S. Coulombe; B.Sc., M.Eng.(Sherb.), Ph.D.(McG.)

R. J. Hill; B.E.(Auck.), Ph.D.(C'nell)

R.L. Leask; B.A.Sc., M.A.Sc.(Wat.), Ph.D.(Tor.)

S. Omanovic; B.Sc., Ph.D.(Zagreb)

#### Paprican Adjunct Professor

G.J. Kubes; B.Sc., M.Sc.(Prague), Ph.D.(Bratislava), P.Eng.

#### Associate Members

T.M.S. Chang (*Physiology*)

R.H. Crotonino, H.L. Goldsmith (*Experimental Medicine*)

#### Adjunct Professors

A. Beils, C. Bélanger, P. Bisailon, R. Campeau, P. Csakany,

M. Davidovsky, D. Dionne, G. Garnier, S. Guiot, B. Huang,

D. Juck, D.J. McKeagan, C. Miguez, P. Nadeau, M. Perrier,

N.P. Peters, M. Renaud, B. Sarkis, J. Sarlis, R.C. Urquhart,

L.A. Utracki, P. Wood-Adams.

### 13.2 Programs Offered

The Department offers programs leading to the Master of Engineering, the Master of Science and the Doctor of Philosophy degrees.

Two options are available for the M.Eng. degree: the thesis option and the project option. The M.Eng. (Thesis) is a research-

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 for science graduates wishing to complete a Master's thesis without acquiring a broad engineering background. The requirements for the M.Sc. are similar to those for the M.Eng. (Thesis).

The Ph.D. is a research degree requiring a thesis which makes a distinct contribution to knowledge.

The Department's offices and research laboratories are located in the M.H. Wong Building, which was completed in 1996. Members of the Department are active in a number of research areas, including heat transfer; mass transfer; separation processes; coupled transport processes; thermodynamics and transport properties; chemical reaction engineering; plasma reactor studies; biochemical engineering; environmental engineering; polymer engineering and rheology. Most staff are members of one or more research groups.

Researchers in Polymer Engineering are members of Polymer McGill which also includes researchers from the Department of Chemistry and Paprican. The group cooperates with researchers at Ecole Polytechnique de Montréal and the Industrial Materials Institute of the National Research Council of Canada.

Research in Biochemical Engineering involves both the microbiology and technology of the production of new products, the development of novel biological reactors including their control and optimization as well as down-stream processing.

Research in Thermal Plasma Technology includes fundamental studies in high temperature transport phenomena and reactor design, as well as applied studies in plasma processing and torch design. Close collaboration is maintained with the the Université de Sherbrooke through the Interuniversity Plasma Technology Research Centre (CRTP) and with the thermal plasma technology group of Hydro-Québec.

Research related to the Environment is pursued on many fronts; for example, the plasma group is investigating plasma-assisted incineration, the biochemical group is evaluating biosorbents for heavy metals, the biodegradation of pesticides, the fate of plasticizers in the environment and more. Other projects involve electrochemical treatment of wastewater, activated sludge treatment, development of environmentally-friendly corrosion inhibitors, etc.

Research in pulp and paper is closely associated with the Pulp and Paper Research Institute of Canada (Paprican). Specialized equipment and facilities of the Paprican main laboratory near Montreal are made available, and several staff are associated jointly with Paprican and the Department.

### 13.3 Admissions Requirements

Admission to graduate study requires a minimum CGPA of 3.0/4.0 (or equivalent) for the complete Bachelor's program or a minimum GPA of 3.2/4.0 (or equivalent) in the last two years of full-time studies. Non-Canadian applicants whose mother tongue is not English must achieve a minimum TOEFL score of 577 on the paper-based test (233 on the computer-based test) prior to admission.

#### M.Eng. (Thesis), M.Eng. (Project)

Admission requires a Bachelor's degree (or equivalent) in chemical or other engineering. Students whose degrees are not in chemical engineering may be required to complete some undergraduate courses during their studies. Students with Bachelor's degrees in science wishing to pursue the M.Eng. first enter a Qualifying Program, normally of two terms, to prepare for entry into the M.Eng. program.

#### M.Sc.

Admission requires a Bachelor's degree (or equivalent) in science. In some cases, depending on the area of research, the stu-

dent may be required to complete one or two extra courses as part of the graduate program.

#### Ph.D.

Admission requires a Master's degree (or equivalent) from a recognized university. Students in the Department's M.Eng. (Thesis) or M.Sc. program may transfer to the Ph.D. program after one year without submitting the Master's thesis following a formal "fast track" procedure.

### 13.4 Application Procedures

The application procedure is outlined on the Web at [www.mcgill.ca/chemeng/grad/application](http://www.mcgill.ca/chemeng/grad/application). The first step in the process is to complete a pre-application form. The completed preliminary application form is evaluated by the Admissions Committee. A formal application is only requested of the candidate if there is a reasonable probability of admission.

Full applications will be considered when the Graduate Admissions Committee has received:

1. application form of the Graduate and Postdoctoral Studies Office ([www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate));
2. two official transcripts;
3. two letters of reference;
4. application fee of \$60 Canadian;
5. TOEFL test results (if required).

Application deadlines differ for International and Canadian (and Permanent Resident) students, to allow time to obtain a visa.

Deadlines for Canadian (and Permanent Resident) applicants:  
 May 15 for September (Fall term) admission,  
 October 1 for January (Winter term) admission,  
 February 1 for May (Summer term) admission.

Deadlines for International applicants:  
 February 15 for September (Fall term) admission,  
 August 1 for January (Winter term) admission,  
 December 1 for May (Summer term) admission.

### 13.5 Program Requirements

#### M.Eng., M.Sc.

The Master's degrees require the completion of 45 credits and three terms of residence at McGill.

#### M.Eng. (Thesis), M.Sc.

Courses: 12 credits (a minimum of 9 credits in chemical engineering).

Research: 33 credits which include completion of a thesis proposal, presentation of a seminar and submission of a thesis.

#### M.Eng. (Project)

Courses: 33-39 credits (a minimum of 18 credits in chemical engineering).

Project: (design or research): 6-12 credits.

The specialized versions of the M.Eng. (Project) follow the above distribution between courses and project.

The specialization in petrochemicals, polymers and plastics, which is offered in cooperation with the Institut Français du Pétrole (IFP), requires that the Winter term be spent at IFP in Paris where 15 course credits are completed. This program may be entered in September, January or May.

The specialization in environmental engineering requires the completion of a Core of 12 credits of environmental engineering courses and a research or design project related to the environment.

#### Ph.D.

The Ph.D. requires three years of residence at McGill.

Courses: 2 chemical engineering courses.

Research: completion of a thesis proposal, its defense, presentation of 2 seminars, and submission and defense of a thesis.

### 13.6 Courses

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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 not offered in 2003-04.

**CHEE 571 SMALL COMPUTER APPLICATIONS: CHEMICAL ENGINEERING.** (3) (2-0-7) (Prerequisite: CHEE 458 or permission of the instructor.) The use of small computers employing a high level language for data acquisition and the control of chemical processes. Real-time system characteristics and requirements, analog to digital, digital to analog conversions and computer control loops are examined. Block level simulation.

- **CHEE 581 POLYMER COMPOSITES ENGINEERING.** (3) (3-0-6)

**CHEE 591 ENVIRONMENTAL BIOREMEDIATION.** (3) (3-0-6) The presence and role of microorganisms in the environment, the role of microbes in environmental remediation either through natural or human-mediated processes, the application of microbes in pollution control and the monitoring of environmental pollutants.

**CHEE 611 HEAT AND MASS TRANSFER.** (4) Heat and mass transfer in laminar and turbulent flows; scaling; models for interphase transport.

**CHEE 621 THERMODYNAMICS.** (4) Theory and application of phase and chemical equilibria in multicomponent systems.

**CHEE 631 FOUNDATIONS OF FLUID MECHANICS.** (4) Rigorous derivation of equations of motion; creeping flow inviscid flow; boundary layer theory; hydrodynamic stability; turbulent flow, separated flows, drag on submerged bodies.

**CHEE 641 CHEMICAL REACTION ENGINEERING.** (4) Interpretation of chemical reaction data, especially for heterogeneous systems. Residence time, complete segregation, maximum mixedness, other advanced concepts. Reactor design.

**CHEE 643 THERMAL PLASMA TECHNOLOGY.** (3) (Prerequisite: Permission of the instructor) An introduction to thermal (high temperature) plasmas as applied to chemical and materials engineering. Degree of ionization, velocity distribution function, plasma parameters, collisions and diffusion, energy states, plasma generation, diagnostic techniques for plasma and particles, particle-plasma interaction, mathematical modelling of plasma systems, applications.

**CHEE 662 COMPUTATIONAL METHODS.** (4) Methods of weighted residuals; solution to non-linear algebraic equations; stability in nonlinear equations; bifurcations; mesh refinement strategies; convection dominated transport; hyperbolic equations, particle simulation methods.

**CHEE 672 PROCESS DYNAMICS AND CONTROL.** (4) (Prerequisite: CHEE 455) Process representation and identification and simulation; sensor stability; sensitivity of feedback control systems; feedforward control; discrete representation of continuous systems; controller tuning; adaptive control.

- **CHEE 673 BIOSYSTEMS ENGINEERING.** (3) (Intensive course.)

**CHEE 681 POLYMER CHEMICAL ENGINEERING.** (3) Application of chemical engineering fundamentals to the preparation and processing of polymers. Classification and characterization of polymers, reaction media and kinetics of polymerization, reactor design, viscoelasticity and rheology, processing techniques, extrusion, molding, composite formation, adhesion.

**CHEE 682 ENGINEERING PROPERTIES OF POLYMERIC MATERIALS.** (3) Mechanical and transport properties of non-crystallizing and crystallizing thermoplastics, rigid thermosets, fibers, films, elastomers and composites with particle and fiber reinforcement. Elasticity, visco-elasticity, ultimate properties, diffusion of liquids and gases, thermal and electrical properties.

- **CHEE 683 POLYMER RHEOLOGY.** (3)

**CHEE 684 POLYMER PROCESSING.** (3) Survey of engineering properties of polymers and processing operations, degradation of polymers, extrusion, injection molding, fiber spinning, film blowing, blow molding, thermoforming, miscellaneous other processes. Lectures, plant visits, problem assignments.

**CHEE 685 POLYMER PRODUCT AND PROCESS DESIGN PROJECT.** (3) Principles of product design, optimization and processing conditions for the production of plastics articles. Selection of resins, process and equipment and tool design, considering cost, safety and environmental aspects of production. Students undertake projects to define specifications for the manufacture of selected plastics articles.

**CHEE 686 POLYMER ENGINEERING LABORATORY.** (3) Study of experimental aspects of polymer characterization. Areas of study are selected from molecular weight determination, polymer morphology, mechanical and rheological behaviour. Polymer processing areas available for study include extrusion, mixing and injection and compression molding.

**CHEE 690 RESEARCH TECHNIQUES.** (3) This course introduces techniques and develops skills necessary for commencing a particular thesis research project. A written report is required.

**CHEE 692 SELECTED TOPICS IN CHEMICAL ENGINEERING.** (2)

**CHEE 693 SELECTED TOPICS IN CHEMICAL ENGINEERING.** (3)

- **CHEE 694 SELECTED TOPICS IN CHEMICAL ENGINEERING.** (4)

**CHEE 695 PROJECT IN CHEMICAL ENGINEERING.** (6) Independent work under the general direction of a full-time staff member, on a problem of industrially-oriented design or research leading to a comprehensive report.

**CHEE 696 EXTENDED PROJECT.** (6) Extended independent work on a problem of industrially-oriented design or research, leading to a comprehensive project report.

**CHEE 697 THESIS PROPOSAL.** (6) Independent work under the supervision of the thesis advisor(s) leading to a thesis proposal.

**CHEE 698 THESIS RESEARCH 1.** (12) (Prerequisite: CHEE 697) Ongoing research pertaining to thesis.

**CHEE 699 THESIS RESEARCH 2.** (15) (Prerequisite: CHEE 698) Ongoing research pertaining to thesis.

**CHEE 795 PH.D. THESIS PROPOSAL.** (0) Independent work under the supervision of the thesis advisor(s) leading to a thesis proposal.

**CHEE 796 PH.D. PROPOSAL DEFENCE.** (0) Presentation and defence of thesis proposal at an oral examination.

**CHEE 797 PH.D. SEMINAR.** (0) (Prerequisite: CHEE 796) Required for all Ph.D. candidates. Presentation of a seminar on an aspect of their thesis work.

## 14 Chemistry

Department of Chemistry  
Otto Maass Chemistry Building  
801 Sherbrooke Street West  
Montreal, QC H3A 2K6  
Canada

Telephone: (514) 398-6999

Fax: (514) 398-3797

E-mail: [graduate.chemistry@mcgill.ca](mailto:graduate.chemistry@mcgill.ca)

Web site: [www.mcgill.ca/chemistry](http://www.mcgill.ca/chemistry)

Chair — R.B. Lennox

Director of Graduate Studies — M. Dahma

### 14.1 Staff

*Emeritus Professors*

B.C. Eu; B.Sc.(Seoul), Ph.D.(Brown)

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.Sc., Ph.D.(Br.Col.), F.C.I.C.  
 D.N. Harpp; A.B.(Middlebury), M.A.(Wesleyan), Ph.D.  
 (N.Carolina), F.C.I.C.  
 G.E. Just; Ing.Chem.(E.T.H. Zürich), Ph.D.(W.Ont.), F.C.I.C.  
 R.J. Kazlauskas; B.Sc.(Clev. State), Ph.D.(M.I.T.)  
 R.B. Lennox; B.Sc., M.Sc., Ph.D.(Tor.)  
 C.J. Li; B.Sc.(Zhengzhou), M.S.(Chinese Academy of Sciences),  
 Ph.D.(McG.)  
 R.H. Marchessault; B.Sc.(Montr.), Ph.D.(McG.), F.C.I.C., F.R.S.C.  
 D.M. Ronis; B.Sc.(McG.), Ph.D.(M.I.T.)  
 E.D. Salin; B.Sc.(Calif.), Ph.D.(Oregon), F.C.I.C.  
 B.C. Sanctuary; B.Sc., Ph.D.(Br.Col.)  
 A.G. Shaver; B.Sc.(Carl.), Ph.D.(M.I.T.)

#### Associate Professors

M.P. Andrews; B.Sc., M.Sc., Ph.D.(Tor.)  
 B.A. Arndtsen; B.A.(Carl.), Ph.D.(Stan.)  
 D.H. Burns; B.Sc.(Puget Sound), Ph.D.(Wash.)  
 W.C. Galley; B.Sc.(McG.), Ph.D.(Calif.)  
 J.L. Gleason; B.Sc.(McG.), Ph.D.(Va.)  
 A. Kakkar; B.Sc., M.Sc.(Chan. U., India), Ph.D.(Wat.)  
 J.F. Power; B.Sc., Ph.D.(C'ida)  
 L. Reven; B.A.(Carl.), Ph.D.(Ill.)

#### Assistant Professors

P. Ariya; B.Sc., Ph.D.(York)  
 K. Auclair; B.Sc.(U.Q.A.C.), Ph.D.(Alta)  
 C.J. Barrett; B.Sc., M.Sc., Ph.D.(Queen's)  
 N. Moitessier; B.A., Ph.D.(Nancy)  
 H. Sleiman; B.Sc.(A.U.B.), Ph.D.(Stan.)  
 P. Wiseman; B.Sc.(St.F.X.), Ph.D.(W.Ont.)

#### Lecturers

J. Finkenbine, G. Wilczek

#### Associate Members

J.A. Finch (Mining, Metals and Materials Engineering),  
 O.A. Mamer (University Clinic, RVH), B.I. Posner (Medicine),  
 K. Gehring (Biochemistry)

#### Paprican Adjunct Professors

D.G. Gray, R. St. John Manley, T.G.M. Van de Ven

#### Adjunct Professors

D. Argyropoulos, Y. Guindon, Y. Tsantrizos, I. Wharf, R. Zamboni

sion and photodegradation in thin films. Technique development for quantitative spectroscopy in scattering media. Micronano-sensors; Chemoinformatics. Analytical spectroscopy of bioenergetics.

**Bio-organic** – Enzyme chemistry; protein and nucleic acid structure and function; drug design and modification; active site stereochemistry; molecular basis of regulation and pharmacological action; lipid and lipid analogue chemistry.

**Biophysical** – Excited electronic states of proteins and nucleic acids; spectroscopic probes of biopolymer conformation; sensitized photochemistry in biopolymers; dynamics of protein and nucleic acid conformations. Spectroscopic analysis of oxygen transport in aerobic metabolism.

**Colloid and Polymer** – Monomolecular layers; solution properties of high polymers; molecular morphology; rheology and stability of dispersions; phase transitions in polymers and polymer blends; polymer reinforcement; radiation effects and solid-state polymerization; mechanisms of polymerization reactions; wetting and spreading; the glass transition; molecular dynamics and polymer properties; ionic polymers; cellulose and paper; carbohydrate biopolymers; pollution abatement; polymer melt rheology; synthetic latex; rheo- and electro-optical phenomena; polymers at interfaces.

**Inorganic** – Synthesis of new classes of organometallic complexes and inorganic polymers; homogeneous catalysis; cationated polysulfur and polysulfoxide complexes; organosilicon chemistry; spectroscopic studies (e.g., FT-IR, laser Raman, multinuclear NMR, and mass) of complexes; kinetics and mechanisms of inorganic and organometallic reactions; bioinorganic chemistry; inorganic materials chemistry; asymmetric catalysis; surface chemistry.

**Organic** – Synthesis and structure of heterocyclic compounds; natural products; carbohydrates; cellulose; plant-growth regulators; organic sulphur, chemistry; stereochemistry; reaction mechanisms; charge transfer complexes; new synthetic methods; conformational analysis; solvation effects; substituent effects; polymer supports; nucleic acids, anti-sense and anti-gene oligonucleotides.

**Physical** – Laser excited luminescence and novel optical materials. Order-disorder phenomena in molecular crystals and liquid crystals. Vibrational spectroscopy at high pressures. Nuclear quadrupole resonance spectroscopy.

**Pulp and Paper** – Research in areas of chemistry of interest to the Canadian pulp and paper industry is also performed at the Pulp and Paper Research Centre, adjacent to the Chemistry Department. Current research topics include cellulose and lignin chemistry, the chemistry of pulping and bleaching, colloidal aspects of papermaking, physical chemistry of cellulosic materials, and de-inking and recycling of paper.

**Theoretical** – Non-equilibrium statistical mechanics, kinetic theory of fluids and plasmas, non-equilibrium thermodynamics of non-linear transport processes for systems far from equilibrium and fluid dynamics. Theories of nuclear magnetic resonance and multiquantum NMR spectra are developed with emphasis on the determination of the structures of proteins from NMR. Molecular structure, chemical bonding, intermolecular forces in solids and isolated molecules in dimers and metastable polymers are studied quantum mechanically.

## 14.2 Programs Offered

M.Sc., Ph.D. and the M.Sc. (Applied).

### Research in Chemistry

Members of the Department are active in directing research in the following fields:

**Analytical** – Atomic and molecular spectroscopy; laboratory automation; artificial intelligence; instrument design; optimization of data processing techniques; application of modern analytical techniques to biochemical and medical systems; detectors for liquid chromatography; photothermal analytical methods; thermal wave imaging; development of analytical techniques for studies of diffu-

## 14.3 Admission Requirements

The minimum academic standard for admission to research thesis M.Sc., Ph.D. and the M.Sc. (Applied) degree programs is a minimum standing equivalent to a Cumulative Grade Point Average (CGPA) of 3.0 out of a possible 4.0 or a CGPA of 3.2/4.0 for the last two full-time academic years. Applicants from other institutions should have an academic background equivalent to that of a McGill graduate in the Chemistry Honours/Major programs. If possible, candidates should specify the field of research in which they are interested.

## 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 demonstrators/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 scholarships. During the four-month project, candidates are paid at rates established by participating companies.

## 14.5 Program Requirements

### M.Sc.\* and Ph.D. Degrees

- Students must take such examinations as may be required in
  - assigned courses given in the Department of Chemistry,
  - assigned cognate courses given in other departments.
 Courses are assigned after taking into consideration the student's previous training and research interest.
- Students must successfully complete a research project and submit an acceptable thesis.
- Students must satisfy the examiners in an oral examination on the thesis and related subjects (required only of candidates for the Ph.D. degree).
- All the usual requirements of the Graduate and Postdoctoral Studies Office must be satisfied.

\* This program requires 45-50 credits.

A minimum of 6 credits of course work is required; the balance of credits will be made up from either a combination of course work (graduate and upper undergraduate) and thesis credits, or from thesis research credits only. There will be a minimum of 24 credits in the thesis research component.

#### M.Sc. (Applied) Degree

This program requires a minimum of 45 credits, 30 credits of course work (graduate and upper undergraduate) plus a 15-credit project in some aspect of chemical industry, normally completed during a four-month project.

### Examinations in Chemistry

- Examinations in assigned courses are normally taken by the candidates in December and May. In special circumstances, and with the permission of the Department and the Graduate and Postdoctoral Studies Office, they may be taken in September.
- A candidate for the Ph.D. degree shall pass all such examinations, other than those in certain special courses, before the final year, except in special circumstances and then only with the approval of the Department.

## 14.6 Courses for Higher Degrees

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

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

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

### Advanced Undergraduate Courses

Undergraduate courses may be required of a student who is admitted to a graduate program if deficiencies are perceived in the student's previous training. Descriptions of undergraduate courses may be found in the Faculty of Science section of the *Undergraduate Programs Calendar*.

- Denotes courses not offered in 2003-04.

**CHEM 502 ADVANCED BIO-ORGANIC CHEMISTRY.** (3) (Prerequisite: CHEM 302) (Not open to students who have taken CHEM 402.) This course will cover biologically relevant molecules, particularly nucleic acids, proteins, and their building blocks. In each case, synthesis and biological functions will be discussed. The topics include synthesis of oligonucleotides and peptides; chemistry of phosphates; enzyme structure and function; coenzymes, and enzyme catalysis; polyketides; antiviral and anticancer agents.

**CHEM 503 DRUG DESIGN AND DEVELOPMENT 1.** (3) (Fall) (Prerequisites: CHEM 302, BIOL 200, BIOL 201 or BIOC 212, PHAR 300 or PHAR 301 or PHAR 303 or permission of instructor) (U3 and graduate students. Students can register only with permission of coordinators. Priority: students registered in the Minor in Pharmacology) (Not open to students who are taking or have taken PHAR 503) Interdisciplinary course in drug design and development covering chemistry, mechanisms of action and steps in drug development, principles and problems in drug design.

**CHEM 504 DRUG DESIGN AND DEVELOPMENT 2.** (3) (Winter) (Prerequisite: CHEM 503 and permission of instructor) (U3 and graduate students. Students can register only with permission of coordinators) (Not open to students who are taking or have taken PHAR 504) Groups of 2-4 students with different backgrounds will form a team. Each team will select a lead compound, design the analogues, propose the preclinical and clinical studies, present possible untoward effects, and reasons for drug (dis)approval.

**CHEM 531 CHEMISTRY OF INORGANIC MATERIALS.** (3) (Winter) (3 lectures) (Prerequisite: CHEM 381) Structure, bonding, synthesis, properties and applications of covalent, ionic, metallic crystals, and amorphous solids. Defect structures and their use in synthesis of specialty materials such as electronic conductors, semiconductors, and superconductors, and solid electrolytes. Basic principles of composite materials and applications of chemistry to materials processing.

**CHEM 534 NANOSCIENCE AND NANOTECHNOLOGY.** (3) (Fall) (Prerequisites: CHEM 334 or PHYS 334 or permission of instructor. Corequisites: one of CHEM 345, PHYS 357, or PHYS 446 or permission of instructor) (Not open to students who have taken or are taking PHYS 534) Topics discussed include scanning probe microscopy, chemical self-assembly, computer modelling, and microfabrication/micromachining.

**CHEM 543 CHEMISTRY OF PULP AND PAPER.** (3) (Fall) (2 lectures plus a reading/research project.) (Prerequisite: CHEM 302 or permission of instructor.) The industrial processes for converting wood to paper are described with emphasis on the relevant organic, physical, surface chemistry and colloid chemistry. The structure and organization of the polymeric constituents of wood are related to the mechanical, optical and other requisite properties of paper.

**CHEM 547 LABORATORY AUTOMATION.** (3) (Winter) (Two 1.5 hour lectures, lab) (Prerequisite: CHEM 377, equivalent or permission of instructor) Automation and data handling with respect to modern chemical laboratory instrumentation. Basic electronics, data acquisition, evaluation of laboratory needs, data processing methodologies.

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

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

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

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

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

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

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

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

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

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

**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 547) Students will undertake a chemical laboratory automation project. Design and implementation problems will be discussed by the students in seminars and advanced topics in automated chemical instrumentation will be presented. Several experiments will be required.

● **CHEM 643 ORGANIC CHEMISTRY / WOOD COMPONENTS.** (4)

● **CHEM 645 QUANTUM MECHANICS.** (5)

● **CHEM 645D1 QUANTUM MECHANICS.** (2.5)

● **CHEM 645D2 QUANTUM MECHANICS.** (2.5)

● **CHEM 646 ADVANCED STATISTICAL MECHANICS.** (4)

**CHEM 647 PHYSICAL CHEMISTRY: SPECIAL TOPIC 1.** (4)

● **CHEM 648 PHYSICAL CHEMISTRY: SPECIAL TOPIC 2.** (4)

**CHEM 650 SEMINARS IN CHEMISTRY 1.** (1) (1 seminar) (Required of first year graduate students in Chemistry.) A seminar course designed for graduate students in chemistry which in conjunction with McGill Chemical Society will provide exposure to a broad range of special topics within the discipline.

**CHEM 651 SEMINARS IN CHEMISTRY 2.** (1) (1 seminar) (Required of first year graduate students in Chemistry.) A seminar course designed for graduate students in chemistry which in conjunction

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) (Prerequisite: CHEM 555 or equivalent.) Advanced techniques of nuclear magnetic resonance spectroscopy, Fourier transform methods, multiple pulsing, two-dimensional pulse sequencing.

**CHEM 661 LITERATURE REVIEW AND PROPOSAL.** (3) (Restricted to graduate students in Chemistry.) Students will review the relevant literature concerning their particular area of research and describe plans for future work.

**CHEM 662 RESEARCH REPORT 1.** (3) (Restricted to graduate students in Chemistry.) Students will prepare a research proposal, and give a seminar.

**CHEM 666D1 SPECIAL TOPICS 2.** (3) (Students must also register for CHEM 666D2) (No credit will be given for this course unless both CHEM 666D1 and CHEM 666D2 are successfully completed in consecutive terms) Critical and original essays are required on various subjects of current interest in chemistry.

**CHEM 666D2 SPECIAL TOPICS 2.** (3) (Prerequisite: CHEM 666D1) (No credit will be given for this course unless both CHEM 666D1 and CHEM 666D2 are successfully completed in consecutive terms)

**CHEM 667 SPECIAL TOPICS.** (4) Critical and original essays are required on various subjects of current interest in chemistry.

**CHEM 672 THE POLYMER SOLID STATE.** (4) Melting and crystallization phenomena in linear high polymers; crystal structure, defects, and morphology in macromolecular crystals.

**CHEM 673 POLYMERS IN SOLUTIONS.** (4) Thermodynamics of regular and of polymer solutions; osmotic pressure; phase separations; polymer configurations; light scattering; ultracentrifugation; viscometry; gel permeation chromatography; polyelectrolytes.

**CHEM 674 INTRODUCTORY PHYSICAL CHEMISTRY - POLYMERS.** (4) A survey course on the structure of polymers; kinetics and mechanisms of polymer synthesis; molecular weight distributions; polymer configurations and the thermodynamics of polymer solutions; rubber, elasticity, osmometry and viscosity.

● **CHEM 675 MECHANICAL PROPERTIES AND RHEOLOGY - POLYMERS.** (4)

**CHEM 686 WET-END PAPERMAKING CHEMISTRY.** (3) (Restricted to graduate students in Chemistry or Chemical Engineering or permission of instructor.) (Prerequisites: CHEM 543 and CHEM 585) Review of the chemistry of various additives used in papermaking, such as wet and dry strength agents, sizing agents, fillers, filler retention aids, antifoam agents, biocides, dyes, dewatering agents, drainage and formation aids. The course also addresses the chemistry of deinking of waste papers and the treatment of effluents.

**CHEM 691 M.Sc. THESIS RESEARCH.** (3) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

**CHEM 692 M.Sc. THESIS RESEARCH.** (6) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

**CHEM 693 M.Sc. THESIS RESEARCH.** (9) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

**CHEM 694 M.Sc. THESIS RESEARCH.** (12) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

**CHEM 695 M.Sc. THESIS RESEARCH.** (15) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

**CHEM 696 M.Sc. THESIS RESEARCH.** (6) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

**CHEM 697 M.Sc. THESIS RESEARCH.** (9) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

**CHEM 698 M.Sc. THESIS RESEARCH.** (12) Independent research work leading to writing of M.Sc. thesis for final submission to the Graduate and Postdoctoral Studies Office.

- **CHEM 699 PROJECT.** (15)
- **CHEM 699D1 PROJECT.** (7.5)
- **CHEM 699D2 PROJECT.** (7.5)

**CHEM 721 ORGANIC CHEMISTRY RESEARCH SEMINAR.** (3) Upon completion of the organic cumulative examinations, students will present a seminar on their research work (including background and future plans).

**CHEM 763 RESEARCH REPORT 2.** (3) (Restricted to graduate students in Chemistry.) Students will present a seminar on a complete or nearly complete research project and discuss these results.

## 15 Civil Engineering and Applied Mechanics

Department of Civil Engineering and Applied Mechanics  
Macdonald Engineering Building  
817 Sherbrooke Street West  
Montreal, QC H3A 2K6  
Canada

Telephone: (514) 398-6858

Fax: (514) 398-7361

E-mail: [gradinfo.civil@mcgill.ca](mailto:gradinfo.civil@mcgill.ca)

Web site: [www.mcgill.ca/civil](http://www.mcgill.ca/civil)

Chair — D. Mitchell

Chair of Graduate Program — S. Gaskin

### 15.1 Staff

#### *Emeritus Professors*

P.J. Harris; B.Sc.(Man.), M.Eng., Ph.D.(McG.), F.E.I.C.,  
F.C.S.C.E., Eng.

R.G. Redwood; B.Sc.(Bristol), M.A.Sc.(Tor.), Ph.D.(Bristol),  
F.C.S.C.E., FI Struct. Eng., Eng.

S.B. Savage; B.Eng.(McG.), M.S.Eng.(Cal.Tech.), Ph.D.(McG.),  
F.R.S.C.

#### *Professors*

V.H. Chu; B.S.Eng.(Taiwan), M.A.Sc.(Tor.), Ph.D.(M.I.T.), Eng.

M.S. Mirza; M.S., B.Eng.(Karachi), M.Eng., Ph.D.(McG.), F.E.I.C.,  
F.C.S.C.E., F.A.C.I., Hon.F.I.E.P., Eng.

D. Mitchell; B.A.Sc., M.A.Sc., Ph.D.(Tor.), F.A.C.I., Eng.

V.T.V. Nguyen; B.M.E.(Vietnam), M.C.E.(A.I.T.), D.A.Sc.(Montr.),  
Eng.

A.P.S. Selvadurai; M.S.(Stan.), Ph.D., D.Sc.(Nott.), F.E.I.C.,

F.I.M.A., F.C.S.C.E., P.Eng.

S.C. Shrivastava; B.Sc.(Eng.)(Vikram), M.C.E.(Del.), Sc.D.(Col.),  
Eng.

#### *Associate Professors*

L. Chouinard; B.Eng., M.Eng.(Montr.), B.C.L.(McG.), Sc.D.(M.I.T.),  
Eng.

R. Gehr; B.Sc.(Eng.)(Witw.), M.A.Sc., Ph.D.(Tor.), P.Eng.

G. McClure; B.Eng.(Mont.), S.M.C.E.(M.I.T.), Ph.D.(Mont.), Eng.

J. Nicell; B.A.Sc., M.A.Sc., Ph.D.(Windsor), P.Eng. (*William  
Dawson Scholar*)

Y. Shao; B.Sc., M.S.(Tongji), Ph.D.(Northwestern)

#### *Assistant Professors*

S.J. Gaskin; B.Sc.(Eng.)(Queen's), Ph.D.(Cant.), Eng.

S. Ghoshal; B.C.E.(India), M.S.(Missouri), Ph.D.(Carnegie Mellon)

M. Haider; B.Sc.(Peshwar), M.A.Sc., Ph.D.(Tor.)

C. Rogers; B.A.Sc., M.A.Sc.(Wat.), Ph.D.(Sydney), P.Eng.

*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.

**M.Eng. (Project) Degree in Civil Engineering – Option in Rehabilitation of Urban Infrastructure**

This program is offered to students with a university undergraduate degree in engineering who want to specialize in the field of maintenance and rehabilitation of urban infrastructures. It is offered jointly by McGill University and École de Technologie Supérieure, École Polytechnique de Montréal, and Institut National de la Recherche Scientifique - Urbanisation. A student registered at McGill is required to take courses at the other four institutions.

**M. Eng. (Environmental Engineering Option) Degree**

This program is offered to students with a university undergraduate degree in engineering who desire graduate education in the environmental engineering field. This option is within the context of the existing M.Eng. (Project Option) and M.Sc. (Applied) programs currently offered in the Departments of Bioresource, Chemical, Civil, and Mining, Metals and Materials Engineering. This program will emphasize interdisciplinary fundamental knowledge courses, practical applications in diverse environmental contexts, and functional skills needed for solving environmental problems. Candidates must possess a Bachelor's degree in engineering with superior academic achievement (a minimum of CGPA of 3.0 out of a possible 4.0).

**M.Sc. Degree**

Candidates with a Bachelor's degree in a discipline other than Engineering, such as Science or Arts, may be accepted into a M.Sc. program in the Department. Such students would typically study in the fluid mechanics, water resources, or environmental engineering areas, and would follow the Thesis Option program, as outlined below.

**15.3 Admission Requirements**

The general rules of the Graduate and Postdoctoral Studies Office apply and are detailed in the General Information section. The minimum academic standard for admission is a Cumulative Grade Point Average (CGPA) of 3.0/4.0 or better.

Applicants whose native language is not English or French, and who have not completed an undergraduate degree in Canada, are expected to achieve a grade of 580 or better on the paper-based (237 on the computer-based) Test of English as a Foreign Language (TOEFL) for entry to the Ph.D. program, and 550 on the paper-based (213 on the computer-based) TOEFL for other programs. The test is administered by the Educational Testing Service and is easily available throughout the world. The results reach McGill approximately eight weeks after the test is taken. It is the student's responsibility to make the necessary arrangements with the examining board to write the test in the country of residence. Full information about the Test and a registration form may be obtained by writing to: Test of English as a Foreign Language, Box 6191, Princeton, New Jersey 08540-6151, U.S.A.

**15.4 Application Procedures**

Applications will be considered upon receipt of:

1. Application form
2. Two official transcripts
3. Two confidential letters of reference
4. \$60 application fee
5. Test results (TOEFL)

Applicants for entry into a graduate program are requested to address their completed forms for admission to the Chair of the Graduate Studies Admissions Committee, Department of Civil Engineering and Applied Mechanics.

Applications for September admission should be submitted by March 1, and those for January admission by August 1 (international students) and October 1 (Canadian students).

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

**15.5 Program Requirements****M.Eng. Degree**

Candidates may satisfy the requirements for the M.Eng. degree by following one of two options:

**Thesis Option** program (45 credits) requires a research thesis (27 credits) and a minimum of five courses (18 credits). The thesis describing the candidate's research is to be submitted in accordance with the regulations of the Graduate and Postdoctoral Studies Office.

**Project Option** program requires a minimum of 30 credits of course work plus a project, the total amounting to 45 credits. The credits assigned to the project can vary between 5 and 15 depending on the amount of work involved.

Both programs normally require that coursework credits be earned at the 500 and 600 levels. However, at least two courses must be taken at the 600 level. The above minimum course requirements for both options pertain to well prepared students; others may be required to take additional courses as a condition of acceptance or as determined in consultation with their director of studies or research. Only one 400-level Civil Engineering course may be counted towards program requirements.

Three terms of resident study at McGill are required for the degree. This is a minimum requirement and usually a longer period will be necessary. This residence requirement can also be satisfied by Project Option students through part-time (evening) studies over a period of three or more years.

**Master of Engineering (Environmental Engineering Option) Degree**

The program consists of a minimum of 45 credits, of which, depending on the student's home department, a minimum of 5 and a maximum of 15 may be allotted to the project. The balance is earned by coursework, of which one to three approved undergraduate (below 500-level) courses are allowed.

To complete the option, students must:

- complete four (4) required core courses (see section A below);
- complete a minimum of two (2) engineering courses (see section B below);
- complete a minimum of two (2) non-engineering courses (each course should be chosen from a different department) (see section C below)
- complete a design or research project of 5 to 15 credits
- complete all the remaining courses (to a total of at least 45 credits) as required in the student's departmental program (these courses must be approved by the student's Academic Advisor); and
- obtain a grade of B- (or 65%) or better in all required and approved courses

**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 in Civil Engineering – Option in Rehabilitation of Urban Infrastructure**

This program is offered jointly by McGill University, École de Technologie Supérieure, École Polytechnique de Montréal, and Institut National de la Recherche Scientifique - Urbanisation. A student registered at McGill is required to take courses at the other four institutions.

The program leads to a professional non-thesis (Project Option) degree with a minimum of 45 credits divided in three modules described below. Depending on their background and interests, students would specialize in one or two out of three possible areas: (1) underground water supply and drainage systems; (2) road infrastructure; (3) bridges, overpasses and tunnels. Students registered at McGill can specialize in area 3 or jointly in areas 2 and 3: students interested in other program scenarios are encouraged to register at one of the other four participating institutions.

**Module 1 Required courses (15 credits)**

CIV(1) 6313 Méthodologie de réhabilitation des infrastructures urbaines  
MGC(2) 810 Gestion des projets de construction et de réhabilitation  
CIVE 512(3) Advanced Civil Engineering Materials (required for McGill students)  
or GCI(4) 715 Matériaux pour la réhabilitation des infrastructures urbaines  
RIU(5) 9500 Analyse du processus de décision et choix technologiques

RIU 9501 Financement des infrastructures et finances publiques locales

**Module 2 Specialized courses (15 credits)**

Elective courses in rehabilitation (6 to 12 credits)

Area 1 Underground water supply and drainage systems

CIV 6314 Évaluation des systèmes d'alimentation en eau et d'assainissement

GCI 745 Réhabilitation des systèmes d'alimentation en eau et d'assainissement

Area 2 Road Infrastructure

MGC 835 Évaluation des chaussées

MGC 840 Conception et réhabilitation des chaussées

Area 3 Bridges, overpasses and tunnels

CIVE 527 Renovation and Preservation: Infrastructure

CIVE 617 Design and Rating of Highway and Railway Bridges (required for McGill students)

or CIV 6511 Conception et évaluation des ponts

Other graduate electives (3 to 9 credits) to be approved by the inter-university program coordination committee. McGill students specializing in area 3 are required to take at least 6 credits at McGill, while those specializing in areas 2 and 3 must take 3 credits at McGill.

**Module 3 Integration (15 credits)**

Research project (15 credits)

(1) Course offered by École Polytechnique de Montréal

(2) Course offered by École de Technologie Supérieure

(3) Course offered by McGill University

(4) Course offered by Université de Sherbrooke (Longueuil Campus)

(5) Course offered by Institut National de la Recherche Scientifique - Urbanisation

Documentation outlining the program and giving additional information is available on request.

**M.Sc. Degree**

Candidates with a Bachelor's degree in a discipline other than Engineering, such as Science or Arts, may be accepted into a M.Sc. program in the Department. Such students would typically study in the fluid mechanics, water resources, or environmental engineering areas, and would follow the Thesis Option program, as outlined above.

**Ph.D. Degree**

Candidates normally register for the M.Eng. degree, Thesis Option, or M.Sc. degree in the first instance. Those who have a Master's degree acceptable to the Department may, however, be considered for direct registration for the Ph.D. degree (Ph.D.II).

The Ph.D. program consists of a research project and courses as required to develop the candidate's background. Candidates are expected to take a comprehensive preliminary oral examination (course CIVE 701) within the first year of their Ph.D. registration. They must fulfill the requirements outlined in the General Information section of the *Graduate and Postdoctoral Studies Calendar*. There is no foreign language requirement.

Direct transfer into the Ph.D. program (fast-tracking) may be available for students who have demonstrated a superior record in the undergraduate program.

**15.6 Courses for Higher Degrees**

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

● Denotes courses not offered in 2003-04.

**CIVE 512 ADVANCED CIVIL ENGINEERING MATERIALS.** (3) (3-3-3)  
(Prerequisite: CIVE 202) Production, structure and properties of

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

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

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

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

**CIVE 540 URBAN TRANSPORTATION PLANNING.** (3) (3-1-5) (Prerequisite: CIVE 319 or permission of instructor.) Process and techniques of urban transportation engineering and planning, including demand analysis framework, data collection procedures, travel demand modelling and forecasting, and cost-effectiveness framework for evaluation of project and system alternatives.

**CIVE 550 WATER RESOURCES MANAGEMENT.** (3) (3-0-6) State-of-the-art water resources management techniques; case studies of their application to Canadian situations; identification of major issues and problem areas; interprovincial and international river basins; implications of development alternatives; institutional arrangements for planning and development of water resources; and, legal and economic aspects.

**CIVE 553 STREAM POLLUTION AND CONTROL.** (3) (3-2-4) Water quality standards. Physical and chemical pollution, and bacterial contamination of surface waters. Effects of specific types of pollution such as thermal, point and non-point sources. Stream self purification. Effects on lake eutrophication. Pollution surveys and methods of control.

● **CIVE 555 ENVIRONMENTAL DATA ANALYSIS.** (3) (3-0-6)

**CIVE 572 COMPUTATIONAL HYDRAULICS.** (3) (3-0-6) (Prerequisite: CIVE 327 or equivalent) Computation of unsteady flows in open channels; abrupt waves, flood waves, tidal propagation; method of characteristics; mathematical modelling of river and coastal currents.

**CIVE 573 HYDRAULIC STRUCTURES.** (3) (3-0-6) (Prerequisites: CIVE 323 and CIVE 327) Hydraulic aspects of the theory and design of hydraulic structures. Storage dams, spillways, outlet works, diversion works, drop structures, stone structures, conveyance and control structures, flow measurement and culverts.

● **CIVE 574 FLUID MECHANICS OF WATER POLLUTION.** (3) (Prerequisite: CIVE 327 or equivalent.)

**CIVE 577 RIVER ENGINEERING.** (3) (3-0-6) (Corequisite: CIVE 428) Fluvial geomorphology; sediment properties; river turbulence; mechanics of the entrainment, transportation and deposition of solids by fluids; threshold of movement; bed forms; suspended load, bed load and total load equations; stable channel design and regime rivers; river modeling; river engineering and river management.

**CIVE 602 FINITE ELEMENT ANALYSIS.** (4) (Prerequisite: CIVE 514) Development of displacement based simple and high order, one, two and three dimensional elements for linear elastic stress analysis. Variational and other methods for element formulation. Plate bending and shell elements. Finite element programming. Use of package programs in static analysis of structures.

**CIVE 603 STRUCTURAL DYNAMICS.** (4) Dynamic loads on structures; equations of motion of linear single- and multiple-degree-of-freedom systems and of continuous systems; free and forced vibrations; damping in structures; modal superposition and time-history analysis; earthquake effects; provisions of the National Building Code of Canada for seismic analysis.

● **CIVE 607 ADVANCED DESIGN IN STEEL.** (4)

**CIVE 609 RISK ENGINEERING.** (4) Quantitative analysis of uncertainty in planning, design, construction, operation and rehabilitation of engineered facilities. Interprets fundamentals of probabilities, random processes, statistics, and decision analysis in the context of engineering applications, in particular description of variability of loads and environmental conditions, material properties performance prediction, system reliability analysis, and risk-based decision analysis.

● **CIVE 610 SPECIAL TOPICS IN STRUCTURAL MECHANICS.** (4)

**CIVE 612 EARTHQUAKE-RESISTANT DESIGN.** (4) Static and dynamic analyses, design codes, effects of local ground conditions, ductility demands on structural components. Inelastic behaviour of beams, columns, joints, shear walls and bracing under cyclic loading of steel concrete and masonry structures. Design applications.

● **CIVE 614 COMPOSITES FOR CONSTRUCTION.** (4)

**CIVE 615 ENVIRONMENTAL ENGINEERING.** (3) The course will expose the students to various environmental engineering issues. Lectures will be given by faculty and invited speakers from industry. Each student is required to prepare a written technical paper and make oral presentation.

● **CIVE 617 DESIGN AND RATING OF HIGHWAY AND RAILWAY BRIDGES.** (4)

**CIVE 618 DESIGN IN CONCRETE 1.** (4) Concrete physical properties, creep, shrinkage; review of ultimate strength design; combined loadings; design of frames and flat plates; limit design, yield line theory; prestressed concrete, partial prestressing and load balancing. The course will include group projects.

● **CIVE 622 PRESTRESSED CONCRETE.** (4)

● **CIVE 623 DURABILITY OF MATERIALS.** (4)

● **CIVE 624 DURABILITY OF STRUCTURES.** (4)

**CIVE 628 DESIGN OF WOOD STRUCTURES.** (4) Review of wood material properties, grades, and design of sawn lumber and timber tension, bending and compression members. Design of connections. Glulam, engineered wood products and systems, shearwalls and diaphragms. Combined loading design, vibration design, moisture and humidity effects, deterioration and protection, fire performance, prescriptive design versus engineering design.

**CIVE 630 THESIS RESEARCH 1.** (3)

**CIVE 631 THESIS RESEARCH 2.** (3)

**CIVE 632 THESIS RESEARCH 3.** (3)

**CIVE 633 THESIS RESEARCH 4.** (6)

**CIVE 634 THESIS RESEARCH 5.** (6)

**CIVE 635 THESIS RESEARCH 6.** (6)

● **CIVE 648 SPECIAL TOPICS IN CIVIL ENGINEERING.** (4)

● **CIVE 651 THEORY: WATER / WASTEWATER TREATMENT.** (4)

**CIVE 652 BIOLOGICAL TREATMENT: WASTEWATERS.** (4) Process kinetics and reactors. Population kinetics of microorganisms and their role in the various waste treatment processes. Unit processes for wastewater treatment, such as suspended-growth, attached-growth processes, sludge treatment, and nutrient removal. Biological treatment techniques for groundwater decontamination. Laboratory pilot plant exercises.

● **CIVE 660 CHEMICAL AND PHYSICAL TREATMENT OF WATERS.** (4)

**CIVE 684 GROUNDWATER POLLUTION AND TRANSPORT PROCESSES.** (4) Advective flow; diffusion transport; diffusion and dispersion coefficients; partition coefficients; adsorption isotherms; conditioned partition coefficients; accumulation and attenuation;

irreversible thermodynamic modelling; Fickian models; calibration and validation requirements; field predictions and calibrations; monitoring and validation; spatial and temporal variability of transport phenomena and coefficients.

**CIVE 686 SITE REMEDIATION.** (4) Field investigations; geotechnical and geophysical techniques; hydrogeological conditions; risk assessment; contaminant transport; remedial action plan; containment systems (gas, surface water, and ground water); on-site and off-site treatment techniques (solidification, stabilization, landfilling, and soil washing); In-situtreatment techniques (physical, biological, and chemical).

**CIVE 691 PROJECT 1.** (1)

**CIVE 692 RESEARCH PROJECT.** (2)

**CIVE 693 RESEARCH PROJECT.** (3)

**CIVE 694 PROJECT 4.** (4)

**CIVE 695 PROJECT 5.** (5)

**CIVE 696 RESEARCH PROJECT.** (6)

**CIVE 697 RESEARCH PROJECT.** (7)

**CIVE 701 PH.D. COMPREHENSIVE PRELIMINARY ORAL EXAM.** (0)

## 16 Classics

Graduate Program in Classics  
Department of History  
Stephen Leacock Building, Room 625  
855 Sherbrooke Street West  
Montreal, QC H3A 2T7  
Canada

Telephone: (514) 398-3977

Fax: (514) 398-8365

E-mail: [graduate.history@mcgill.ca](mailto:graduate.history@mcgill.ca)

Web site: [www.arts.mcgill.ca/programs/history](http://www.arts.mcgill.ca/programs/history)

### 16.1 Staff

#### *Emeritus Professors*

P. F. McCullagh; B.A.(Tor.), M.A.(McG.), Ph.D.(Chic.)

P. Vivante; B.A.(Oxon), Dott.Lett.(Florence) (*John MacNaughton Emeritus Professor of Classics*)

#### *Professor*

T. Wade Richardson; B.A.(McG.), A.M., Ph.D.(Harv.)

#### *Associate Professor*

Michael J. Silverthorne; B. Litt., M.A., D. Phil.(Oxon)

### 16.2 Programs Offered

**M.A. with Thesis** (48 credits over 4 terms, in 18 or 24 months)

**M.A. non-Thesis option** (48 credits over 3 or 4 terms, in 18 months)

**Ph.D.**

### 16.3 Admission Requirements

#### **M.A. Program**

Candidates are required to have a B.A. Honours in Classics or equivalent.

#### **Ph.D. Program**

Candidates are required to have a McGill M.A. in Classics or equivalent.

### 16.4 Application Procedures

No applications will be accepted for 2003-04 as the program has been temporarily suspended. Further information may be obtained from the Department of History.

### 16.5 Program Requirements

Please consult the Department for detailed regulations.

#### **M.A. with thesis**

- 1) Course work: 18 credits
- 2) Special subjects: 6 credits (CLAS 695D1/CLAS 695D2)
- 3) Thesis: 24 credits:
  - CLAS 696 – Methods (3)
  - CLAS 697 – Proposal (3)
  - CLAS 698 – Preparation (6)
  - CLAS 699 – Completion (12)

#### **M.A. non-thesis option**

- 1) Course work: 24 credits.
- 2) Special subjects: 12 credits (CLAS 685D1/CLAS 685D2, CLAS 686D1/CLAS 686D2).
- 3) Research papers: 12 credits
  - CLAS 681 – Research Paper 1 (3)
  - CLAS 682 – Research Paper 2 (3)
  - CLAS 683 – Research Paper 3 (3)
  - CLAS 684 – Research Paper 4 (3)

#### **Ph.D.**

- 1) Course work: 24 credits;
- 2) Reading list;
- 3) Thesis and Oral Defence.

### 16.6 Courses Offered

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

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

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

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

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

## 17 Communication Sciences and Disorders

School of Communication Sciences and Disorders  
Beatty Hall  
1266 Pine Avenue West  
Montreal, QC H3G 1A8  
Canada

Telephone: (514) 398-4137  
Fax: (514) 398-8123  
E-mail: [scsd@mcgill.ca](mailto:scsd@mcgill.ca)  
Web site: [www.mcgill.ca/scsd](http://www.mcgill.ca/scsd)

*Director* — Shari Baum

*Research Director* — Elin Thordardottir

### 17.1 Staff

#### *Emeritus Professor*

Donald Doehring; B.A.(Buff.), M.A.(N.M.), Ph.D.(Ind.)

#### *Professors*

Shari Baum; B.A.(C'nell), M.S.(Vt.), M.A., Ph.D.(Brown)  
Martha Crago; B.A., M.Sc.A., Ph.D.(McG.)  
Athanasios Katsarkas; M.D.(Thess.), M.Sc.(McG.), F.R.C.P.(C)

#### *Associate Professors*

Vincent Gracco; B.A., M.A.(San Diego), Ph.D.(Wis.-Madison)  
Rachel Mayberry; B.A.(Drake), M.S.(Wash.), Ph.D.(McG.)  
Linda Polka; B.A.(Slippery Rock), M.A.(Minn.), Ph.D.(S.Flor.)

#### *Assistant Professors*

Marc Pell; B.A.(Ott.), M.Sc., Ph.D.(McG.)  
Elin Thordardottir; B.A., M.Sc., Ph.D.(Wis.-Madison)

#### *Assistant Professor (Special Category)*

Susan Rvachew; B.Sc.(Alta.), M.Sc., Ph.D.(Calgary)

#### *Assistant Professors (Part-Time)*

Gabriel Leonard; B.A.(Dublin), D.A.P., M.Sc., Ph.D.(McG.)  
Sybil Schwartz; B.Sc.(McG.), M.Sc.A.(Iowa St.), Ph.D.(McG.)  
Rosalee Shenker; B.Sc.(Syr.), M.A.(Calif. St.), Ph.D.(McG.)

#### *Faculty Lecturer*

Jeanne Claessen; M.A.(Reading), Dip. Clinical Communication  
Studies(City University, London)

#### *Faculty Lecturers (Part-Time)*

Joane Déziel; B.Sc., M.Sc.(Montr.)  
Daphne Ducharme; B.A., M.A.ED, Ph.D.(Ott.)  
Ruth Gesser; B.A.(C'dia), M.Sc.A.(McG.)  
Jill Harrisson; B.A., M.Sc.(McG.)  
Helena Kisilevsky; B.A.(McG.), M.A.(UCLA), M.O.A.(Montr.)  
Anne Le Turdu; M.A.(U de médecine Claude-Bernard Lyon-  
France)  
Jim McNutt; B.S.(Edin.), M.Ed.(Penn St.), Ph.D.(Kent St.)  
Cathy Mhun; B.A., M.Sc.A.(McG.)  
Darla Orchard; B.A., M.Sc.(McG.)  
Linda Ritchey; B.Sc., M.A.(Minn.)  
Judith Robillard-Shultz; B.A., M.Sc.A.(McG.)  
Phaedra Royle; B.A.(C'dia), M.A.(McG.), Ph.D.(Montr.)  
Megha Sundara; B.Sc., M.Sc.(All India Inst. of Speech & Hearing)  
Colleen Timm; B.A.(C'dia), M.Sc.A.(McG.)  
Paraskevi Tsagaroulis; B.Sc.(McG.), M.Cl.Sc.(W.Ont.)  
Patricia Viens; ASLTA Certificate(Rochester I.T.), ASL Workshop  
Certificate(Vista U.)

#### *Associate Members*

Eva Kehayia (Physical and Occupational Therapy)  
Yuriko Oshima-Takane (Psychology)

#### *Adjunct Members*

Howard Chertkow (*Jewish Gen.*), David McFarland (*Montr.*)

### 17.2 Programs Offered

The School offers a professional degree in Communication Sciences and Disorders at the M.Sc. (Applied) level with specialization in Speech-Language Pathology and two research degrees, an M.Sc. (Research) and a Ph.D. in Communication Sciences and Disorders.

#### **M.Sc.(Applied) Degree in Communication Sciences and Disorders**

The professional degree leads to a Master of Science (Applied) with a specialization in Speech-Language Pathology. The program involves two academic years of full-time study and related practical work followed by a summer internship. To prepare students as creative professionals, the program emphasizes the understanding of principles and theories, and their present or potential clinical applications, in addition to the teaching of specific techniques for assessment and intervention. Active participation in the learning process is encouraged.

The profession of Speech-Language Pathology concerns assessment and intervention in speech and language disorders. In particular, the Speech-Language Pathologist is concerned with two major parameters of communication sciences and disorders: language and speech. At present, most speech-language pathologists in Canada work in hospitals, public school systems, rehabilitation centres, and in special education facilities.

**Requirements for Licensure** – The majority of provinces in Canada and certain states in the U.S.A. require that those intending to practice as Speech-Language Pathologists within their borders comply with special provincial or state licensing regulations. Graduates wishing to practice in the province of Quebec must be members of l'Ordre des Orthophonistes et Audiologistes du Québec (OOAQ) in order to call themselves Speech-Language Pathologists. Further information is available from the OOAQ, 235, boulevard René Levesque est, bureau 601, Montréal (Québec) H2X 1N8. Telephone: (514) 282-9123. Web site: [www.ooaq.qc.ca](http://www.ooaq.qc.ca)

Quebec law requires that candidates seeking licensure in provincially recognized professions demonstrate a verbal and written working knowledge of the French language. See the Language Requirements for Professions in the General Information and Regulations section of the *Health Sciences Calendar*.

#### **Research Degrees – M.Sc. and Ph.D.**

Selected candidates may be accepted for the M.Sc. and Ph.D. research degrees. Each student's Thesis supervisor and Thesis Committee design an individualized program of study in collaboration with the student. The program can include graduate courses offered by the School and by other departments at McGill.

#### **Ph.D. Option in Language Acquisition (LAP)**

Information about this option is available from the School and on the Web at [www.psych.mcgill.ca/lap.html](http://www.psych.mcgill.ca/lap.html).

#### **Funding**

The IODE Provincial Chapter of Quebec funds two \$1,000 "Silence to Sound" awards for studies in hearing impairment. These in-course awards based on academic merit, financial need, and potential for excellence are awarded by the School.

Montreal League for the Hard of Hearing Award.  
Candidates must be enrolled at the graduate level in the School and working in the area of hearing impairment. Awarded by the School. Value – up to \$1,000.

### 17.3 Admissions Requirements

#### **M.Sc.(Applied)**

An applicant must hold an undergraduate degree with a minimum B average (3.0 on a 4.0 point scale) or better in areas relevant to the selected field of specialization. Specific requirements are six credits in statistics, a total of 18 credits across the disciplines of

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](http://www.mcgill.ca/applying/graduate).

### **M.Sc.(Applied)**

The complete application should be submitted directly to the School's Admissions Secretary and must be received by February 1, or it may not be considered for the following academic year. Applications will be considered upon receipt of:

1. completed application and information forms ([www.mcgill.ca/scsd/application](http://www.mcgill.ca/scsd/application))
2. two official copies of all university transcripts (only one official transcript from McGill University)
3. two letters of recommendation from professors (on the appropriate forms)
4. listing of relevant courses completed and in progress, relevant experience, and publications
5. statement of interest
6. a \$60 application fee (credit card, money order, or certified cheque)
7. students living outside of Canada whose first language is not English and who have not received university education in English must also provide official reports of their score on the "Test of English as a Foreign Language" (TOEFL). A score of 550 or better on the paper-based test (213 on the computer-based test) is required for admission or the International English Language Testing System (IELTS) with a minimum overall band score of 6.5.

### **M.Sc. (thesis) and Ph.D. programs**

Application for Fall admission are processed shortly after the deadline of February 22. All applications received by that date are automatically considered for any internal funding or awards made available to the department for recruitment purposes. Applications for Winter or Summer admission are processed when they are received, but must be received no later than August 1 (Winter admission) or December 15 (Summer admission). Students who apply for Fall admission generally have the most options with respect to applying for external funding as well as for being considered for internal support.

Applications will be considered upon receipt of:

1. to 7. as above, plus
8. All applicants strongly encouraged to submit reports of their performance on the Graduate Record Examination (GRE).

## **17.5 Program Requirements**

### **M.Sc.(Applied) Degree in Communication Sciences and Disorders (68 credits)**

The professional degree program leads to a Master of Science, Applied degree in Communication Sciences and Disorders with a specialization in Speech-Language Pathology. The program involves two academic years of full-time study and related practical work followed by a summer internship.

#### **Year 1 Required Courses (31 credits)**

##### **Fall**

- SCSD 616 (3) Audiology  
SCSD 617 (3) Anatomy and Physiology of Speech and Hearing

- SCSD 619 (3) Phonological Development  
SCSD 624 (3) Language Processes  
SCSD 633 (3) Language Development  
SCSD 681 (1) Practicum and Seminar 1

##### **Winter**

- SCSD 631 (3) Speech Science  
SCSD 632 (3) Phonological Disorders: Children  
SCSD 637 (3) Developmental Language Disorders 1  
SCSD 638 (3) Neurolinguistics  
SCSD 682 (1) Practicum and Seminar 2

##### **Summer**

- SCSD 646 (2) Introductory Clinical Practicum

#### **Year 1 Complementary Course (3 credits)**

One three-credit seminar option must be taken.

#### **Year 2 Required Courses (31 credits)**

##### **Fall**

- SCSD 618 (3) Research and Measurement Methodologies  
SCSD 636 (3) Fluency Disorders  
SCSD 639 (3) Voice Disorders  
SCSD 643 (3) Developmental Language Disorders 2  
SCSD 644 (3) Applied Neurolinguistics  
SCSD 683 (1) Practicum and Seminar 3

##### **Winter**

- SCSD 609 (3) Neuromotor Disorders  
SCSD 642 (3) Aural Rehabilitation  
SCSD 668 (3) Communicatively Disordered Person: Practice  
SCSD 669 (3) Special Developmental Speech/Language Problems  
SCSD 684 (1) Practicum and Seminar 4

##### **Summer**

- SCSD 679 (2) Advanced Clinical Practicum

#### **Year 2 Complementary Course (3 credits)**

One three-credit seminar option must be taken.

### **M.Sc.(Applied) Complementary Course List**

- SCSD 634 (3) Research and Measurement Methodologies 2  
SCSD 664 (3) Communication Sciences and Disorders 1  
SCSD 666 (3) Communication Sciences and Disorders 3  
SCSD 667 (3) Communication Sciences and Disorders 4  
SCSD 670 (3) Communication Sciences and Disorders 2

A seminar may also be taken outside of the School upon approval of a faculty advisor.

### **M.Sc. in Communication Sciences and Disorders (45 credits)**

M.Sc. candidates must complete at least 45 credits, including a minimum of 24 and a maximum of 39 credits for thesis research (courses SCSD 671, SCSD 672, SCSD 673 and SCSD 674), and a minimum of 6 credits in other courses. The non-thesis credits can be special topic courses in the School and/or courses in other departments, as arranged with the student's thesis supervisor.

#### **Thesis Component – Required (24 credits)**

- SCSD 671 (12) M.Sc. Thesis 1  
SCSD 672 (12) M.Sc. Thesis 2

**Complementary Courses** (21 credits)

a maximum of 15 credits may be chosen from:

- SCSD 673 (12) M.Sc. Thesis 3
- SCSD 674 (3) M.Sc. Thesis 4

a minimum of 6 credits must be chosen from:

- SCSD 675 (12) Special Topics 1
- SCSD 676 (9) Special Topics 2
- SCSD 677 (6) Special Topics 3
- SCSD 678 (3) Special Topics 4

or courses in other departments, as arranged with the student's thesis supervisor

**Ph.D. in Communication Sciences and Disorders**

Ph.D. students must complete a full graduate course in statistics and both advanced research seminars as well as the other course requirements in their individual program of study, and pass a comprehensive examination. Students entering the Ph.D. program through the fast-track option must additionally demonstrate the ability to complete a research project and related coursework during the initial year. An examination in a foreign language is not required.

**Required Courses**

- SCSD 652 (3) Advanced Research Seminar 1
- SCSD 653 (3) Advanced Research Seminar 2
- SCSD 685 (3) Research Project 1
- SCSD 686 (3) Research Project 2
- SCSD 701 Doctoral Comprehensives

**17.6 Courses**

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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 not offered in 2003-04.

**SCSD 609 NEUROMOTOR DISORDERS.** (3) The focus of this course will be on the assessment and management of motor speech disorders, associated with both acquired and developmental neuromotor disorders, and swallowing disorders (of both neuromotor and structural origin).

**SCSD 616 AUDIOLOGY.** (3) Basic diagnostic and rehabilitative procedures, goals and procedures used in clinical audiology, and the psychoacoustic theories on which they are based will be presented.

**SCSD 617 ANATOMY AND PHYSIOLOGY: SPEECH AND HEARING.** (3) The anatomy and physiology of speech and hearing mechanisms will be covered. Topics will include neuroanatomy, the anatomy and physiology of the head, neck and upper torso, and the external, middle, and inner ear.

**SCSD 618 RESEARCH AND MEASUREMENT METHODOLOGIES 1.** (3) Methodologies used in research and measurement in the field of communication sciences and disorders will be introduced. Topics covered include: the nature and interpretation of test norms; validity; interpretation of test score differences; and questionnaire development (scaling). Tests currently used in speech-language pathology and audiology are examined.

**SCSD 619 PHONOLOGICAL DEVELOPMENT.** (3) Theories and research related to normal and abnormal phonological development in children will be studied.

**SCSD 624 LANGUAGE PROCESSES.** (3) The structure and nature of on-line processing of the language code, and the interaction of structure and function of language will be studied. Theories about the nature of representation and research concerning its processing, and the role of sociocultural factors in linguistic performance also will be covered.

**SCSD 631 SPEECH SCIENCE.** (3) The acoustic analysis and perception of speech and related pathologies will be presented. Theories and models of speech production, speech motor control, and speech perception will be considered.

**SCSD 632 PHONOLOGICAL DISORDERS: CHILDREN.** (3) The nature of phonological disorders and clinical approaches for their remediation in children will be presented.

**SCSD 633 LANGUAGE DEVELOPMENT.** (3) Theories of language acquisition, prerequisites to language development, and current issues in research will be studied. Topics include the role of input, individual differences in acquisition, and language socialization.

- **SCSD 634 RESEARCH AND MEASUREMENT METHODS 2.** (3)

**SCSD 636 FLUENCY DISORDERS.** (3) The nature of stuttering, various causal theories, and techniques for evaluation and treatment of children and adults will be presented.

**SCSD 637 DEVELOPMENTAL LANGUAGE DISORDERS 1.** (3) The nature of developmental language disorders and the assessment of language competence and performance in both speaking and non-speaking children will be studied.

**SCSD 638 NEUROLINGUISTICS.** (3) Current theories of language-brain relationships and speech and language deficits subsequent to brain damage will be studied. A review of current research on phonetic, lexical, and syntactic processing in brain-damaged individuals is included.

**SCSD 639 VOICE DISORDERS.** (3) Information about the vocal mechanism, its pathologies, and methods of evaluation and treatment will be studied.

**SCSD 642 AURAL REHABILITATION.** (3) This course addresses the effects of hearing impairment in adults as well as in the developing child with attention to problems in speech, language, and cognitive function as well as social-emotional adjustment. Various intervention approaches are examined.

**SCSD 643 DEVELOPMENTAL LANGUAGE DISORDERS 2.** (3) Major theories of language disorders are translated into intervention principles used in language treatment programs. Adaptations of intervention techniques to suit specific disorders (including augmentative communication) will be explored.

**SCSD 644 APPLIED NEUROLINGUISTICS.** (3) Various classificatory systems and appropriate assessment and remediation principles for brain-damaged individuals will be covered. Theoretical and clinical issues relevant to treatment of aphasic, neuromotor, and memory disorders will be considered.

**SCSD 646 INTRODUCTORY CLINICAL PRACTICUM.** (2) This course provides an introduction to professional practice through intensive exposure to a variety of clinical populations.

**SCSD 652 ADVANCED RESEARCH SEMINAR 1.** (3) (This course may be taken as an advanced course for M.Sc. students.) Pro seminar in which current research topics in communication disorders will be discussed.

**SCSD 653 ADVANCED RESEARCH SEMINAR 2.** (3) (This course may be taken as an advanced course for M.Sc. students.) Pro seminar in which current research topics in communication disorders will be discussed.

**SCSD 664 COMMUNICATION SCIENCES AND DISORDERS 1.** (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

**SCSD 666 COMMUNICATION SCIENCES AND DISORDERS 3.** (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

**SCSD 667 COMMUNICATION SCIENCES AND DISORDERS 4.** (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

**SCSD 668 COMMUNICATIVELY DISORDERED PERSON: PRACTICE.** (3) This course addresses clinical and supervisory processes, the social and emotional impact of communicative disabilities, and professional issues related to the practice of speech-language pathology and audiology.

**SCSD 669 SPECIAL DEVELOPMENTAL SPEECH/LANGUAGE PROBLEMS.** (3) Information pertinent to cerebral palsy, cleft palate, autism, mental retardation, multiple handicaps and syndromes involving speech and language disorders will be presented. General descriptions of the disorders and specific assessment and remedial procedures will be addressed.

**SCSD 670 COMMUNICATION SCIENCES AND DISORDERS 2.** (3) Current research and professional issues in communication sciences and disorders will be discussed. Specific topics to be selected yearly.

**SCSD 671 M.Sc. THESIS 1.** (12)  
**May be offered as: SCSD 671D1 and SCSD 671D2, or SCSD 671N1 and SCSD 671N2.**

**SCSD 672 M.Sc. THESIS 2.** (12)  
**May be offered as: SCSD 672D1 and SCSD 672D2, or SCSD 672N1 and SCSD 672N2.**

**SCSD 673 M.Sc. THESIS 3.** (12)  
**May be offered as: SCSD 673D1 and SCSD 673D2, or SCSD 673N1 and SCSD 673N2.**

**SCSD 674 M.Sc. THESIS 4.** (3)

**SCSD 678 SPECIAL TOPICS 4.** (3)

**SCSD 679 ADVANCED CLINICAL PRACTICUM.** (2) This course enhances professional practice independence through intensive exposure to a variety of clinical populations.

**SCSD 681 PRACTICUM AND SEMINAR 1.** (1) Course provides initial practicum experiences including a combination of the following: speech/language and hearing screenings, facility tours, short term placements and laboratory assignments.

**SCSD 682 PRACTICUM AND SEMINAR 2.** (1) This course provides clinical experience through short-term placements and screenings, as well as discussions of current practicum issues.

**SCSD 683 PRACTICUM AND SEMINAR 3.** (1) Professional practice experiences focusing on a variety of clinical populations are provided. Discussion of advanced issues in clinical practice is included.

**SCSD 684 PRACTICUM AND SEMINAR 4.** (1) This course provides clinical practicum experiences in a range of settings. Professional practice issues are considered.

**SCSD 685 RESEARCH PROJECT 1.** (3) Supervised research project.

**SCSD 686 RESEARCH PROJECT 2.** (3) Supervised research project.

**SCSD 701 DOCTORAL COMPREHENSIVE.** (0)  
**May be offered as: SCSD 701D1 and SCSD 701D2.**

**SCSD 712 LANGUAGE ACQUISITION ISSUES 4.** (2)

## 18 Communication Studies

Department of Art History and Communication Studies  
 Arts Building, W-225 (West Wing, top floor)  
 853 Sherbrooke Street West  
 Montreal, QC H3A 2T6  
 Canada

Telephone: (514) 398-6541

Fax: (514) 398-7247

E-mail: [ahcs@mcgill.ca](mailto:ahcs@mcgill.ca)

Web site: [www.arts.mcgill.ca/programs/AHCS](http://www.arts.mcgill.ca/programs/AHCS)

Chair — Christine Ross

*Director, Graduate Programs in Art History —*  
 Hans J. Böker (on leave Sept. 2002 - Dec. 2003)

*Acting Director, Graduate Programs in Art History —*  
 Christine Ross

*Director, Graduate Programs in Communication —* Will Straw

### 18.1 Staff

#### *Emeritus Professors*

John M. Fossey; B.A.(Birm.), D.U.(Lyon II), F.S.A., R.P.A.  
 George Galavaris; M.A.(Athens), M.F.A., Ph.D.(Prin.), F.R.S.C.  
 George Szanto; B.A.(Dart.), Ph.D.(Harv.)

#### *Professor*

Hans J. Böker; Ph.D.(Saarbrücken), Dr. Ing.-habil(Hannover)  
 (on leave Sept. 2002 - Dec. 2003)

#### *Associate Professors*

David Crowley; B.A.(Johns H.), M.Sc.(Penn.), Ph.D.(McG.)  
 Christine Ross; M.A.(C'dia.), Ph.D.(Paris I)  
 Will Straw; B.A.(Carl.), M.A., Ph.D.(McG.)

#### *Assistant Professors*

Jenny Butman; B.A.(C'dia), M.A., Ph.D.(York)  
 Ting Chang; B.A.(McG.), M.A.(Tor.), Ph.D.(Sussex) (on leave 2003-04)

Charmaine Nelson; B.F.A., M.A.(C'dia), Ph.D.(Man.)  
 Bronwen Wilson; B.A., M.A.(U.B.C.), Ph.D.(Northwestern) (on leave 2003-04)

Angela Vanhaelen; B.A.(W.Ont.), M.A., Ph.D.(U.B.C.)

#### *Assistant Professor (Special Category)*

Francesca Dal Lago; B.A.(Univ. of Venice), M.A., Ph.D.(NYU)

#### *Adjunct Professors*

David W. Booth, Louis De Moura Sobral, Johanne Lamoureux,  
 Charles Levin, Constance Naubert-Riser, Jocelyne Picot

### 18.2 Programs Offered

The Communication Studies Program offers courses and directs project research in preparation for the M.A. (Thesis and Non-thesis options) and Ph.D. in Communications.

The Program is concerned with the study of communications phenomena through interdisciplinary activity that includes both theoretical and practical considerations of the various modes and media of communication. The Program does not provide the purely technical training which can be more appropriately carried out by institutions of technology and communication arts, rather the focus is on broadening the understanding of the interplay between practical needs and theoretical perspectives. The special theoretical interest of the Program centres on the nature and scope of human communications as they emphasize the relationship of cognitive, social and aesthetic problems.

For more information on the Program, please visit our Web site [www.arts.mcgill.ca/programs/AHCS](http://www.arts.mcgill.ca/programs/AHCS).

To obtain financial aid information please consult the Graduate and Postdoctoral Studies Office, McGill University, James Administration Building, Room 400, 845 Sherbrooke Street W., Montreal, Quebec, H3A 2T5. Telephone: (514) 398-3990. Web site: [www.mcgill.ca/gps](http://www.mcgill.ca/gps).

For programs in Art History refer to [section 6](#).

### 18.3 Admission Requirements

#### **M.A.**

An Honours Bachelor's degree or equivalent is required of applicants for the M.A. program with a minimum CGPA of 3.3 on 4.0 or the equivalent, i.e., B+ (75%), is required. In any case, the transcript must show breadth or depth in related areas of study.

#### **Ph.D.**

Applicants for the Ph.D. program are expected to have completed the equivalent of an M.A. degree. Admission will be based on

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 student's interest in Communication and the proposed area of research.
7. Two examples of written work.
8. Proof of Citizenship (certified photocopy of passport, birth certificate or equivalent).

Deadline for application is January 15.

Inquiries regarding the Program 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](http://www.mcgill.ca/applying/graduate).

## 18.5 Program Requirements

### M.A. Degree (48 credits)

The Master's Program consists of a three-term program of courses. Successful completion of the M.A. requires either:

- a) **Thesis option:** a total of 8 courses (24 credits) and a thesis (24 credits), or
- b) **Non-Thesis option:** a total of 12 courses (36 credits) and two research projects (12 credits);

and the fulfillment of a language requirement.

### Ph.D. Degree

Candidates with an M.A. degree will be admitted at the Ph.D. 2 level, thereby gaining credit for one year of resident study. When admitted at Ph.D. 1 level, three years of residence are required for the Doctoral degree. The program of study is comprised of 4

courses, the Pro-Seminar, a comprehensive examination, a project, the fulfillment of a language requirement and a written dissertation with its defence.

## 18.6 Courses Offered

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.**

**Students may also consult the Department Web site ([www.arts.mcgill.ca/programs/AHCS](http://www.arts.mcgill.ca/programs/AHCS)) for information.**

**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.

**ENGC 521 COMMUNICATIONS IN HISTORY.** (3) North American communication studies have undergone five discernible changes in the definition and focus of the field. The major "schools" of thought to be covered are the Chicago and Lazarsfeld heritages, the institutionalization of communication science in the academy, and the post-modern period.

**ENGC 541 CULTURAL INDUSTRIES.** (3) The convergence of computerized technologies and cultural industries and how these have produced entire new forms of cultural expression in film, TV, and the Internet.

**ENGC 611 HISTORY/THEORY/TECHNOLOGY.** (3) A critical appraisal of current issues in the field of communications notably through an examination of how new theorists have dealt with the effects and consequences of developments in the technologies of communication. The contributions of Canadian media theorists figure significantly in the seminar's concerns.

**ENGC 613 GENDER AND TECHNOLOGY.** (3) Contemporary culture and media in Canada and Quebec since 1945, with special emphasis on the '70s.

**ENGC 616 STAFF-STUDENT COLLOQUIUM.** (3) Pro-Seminar in Communications. A required course for all new M.A. and Ph.D. students. The Pro-Seminar is designed to explore theoretical and methodological issues in Communications through a series of presentations by the faculty and other McGill associates.

**ENGC 617 STAFF-STUDENT COLLOQUIUM.** (3) A required course for all new M.A. and Ph.D. students. The Pro-Seminar is designed to explore theoretical and methodological issues in Communications through a series of presentations by the faculty and other McGill associates.

**ENGC 619 CULTURAL COMMODITIES.** (3) The relationship between current theories of communications, cultural policy and cultural institutions. Analysis of popular culture and its relationship to other cultural artifacts in modern societies.

**ENGC 621 INTERPERSONAL COMMUNICATION.** (3) An examination of communication behavior with a special emphasis placed on the study of interpersonal communication in the mass media, especially advertising and political rhetoric.

- **ENGC 623 INFORMATION DESIGN.** (3)

**ENGC 625 NEW MEDIA POLICY.** (3) New media policies in relation to changing communication needs in the context of shifting regulatory demands.

**ENGC 629 CANADIAN CULTURAL COMMUNICATIONS POLICY.** (3) An advanced seminar in history and theory of Canadian cultural and communications policy in the context of rapidly changing technological environments.

**ENGC 630 READINGS IN COMMUNICATIONS RESEARCH.** (3)

- **ENGC 631 DISCOURSE ANALYSIS.** (3)

**ENGC 633 GENDER AND REPRESENTATION.** (3) Research Seminar on a topic on gender.

**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 course for all new Ph.D. students. The Pro-Seminar is designed to explore theoretical and methodological issues in Communications through a series of presentations by the faculty and other McGill associates.

May be offered as: **ENGC 702D1** and **ENGC 702D2**, or **ENGC 702N1** and **ENGC 702N2**.

**ENGC 703 COMPREHENSIVE EXAMINATION PART 2.** (6)

May be offered as: **ENGC 703D1** and **ENGC 703D2**.

**ENGC 704 COMPREHENSIVE EXAMINATION PART 3.** (6)

May be offered as: **ENGC 704D1** and **ENGC 704D2**.

**ENGC 705 COMPREHENSIVE EXAMINATION PART 4.** (6)

May be offered as: **ENGC 705D1** and **ENGC 705D2**.

**ENGC 730 READINGS IN COMMUNICATIONS RESEARCH.** (3)

L. Hendren; B.Sc., M.Sc.(Queen's), Ph.D.(C'nell)

(on leave 2003-04)

T.H. Merrett; B.Sc.(Queen's), D.Phil.(Oxon)

M.M. Newborn; B.E.E.(R.P.I.), Ph.D.(Ohio St.), F.A.C.M.

P. Panangaden; M.Sc.(I.I.T. Kanpur), Ph.D.(Wis.)

(on leave 2003-04)

G.F.G. Ratzler; B.Sc.(Glas.), M.Sc.(McG.) (on leave 2003-04)

B. Reed; B.Sc, Ph.D.(McG.) (CRC Professor)

D. Therien; B.Sc.(Mont.), Ph.D.(Wat.) (James McGill Professor)

G.T. Toussaint; B.Sc.(Tulsa), Ph.D.(Br.Col.)

S. Whitesides; M.S.E.E.(Stan.), Ph.D.(Wis.)

#### Associate Professors

M. Blanchette; B.A., M.Sc.(Montr.) Ph.D.(Wash.)

C. Crepeau; B.Sc., M.Sc.(Montr.), Ph.D.(M.I.T.)

G. Dudek; B.Sc.(Queen's), M.Sc., Ph.D.(Tor.)

N. Friedman; B.A.(W.Ont.), Ph.D.(Tor.)

C. Tropper; B.Sc.(McG.), Ph.D.(Brooklyn Poly.)

#### Assistant Professors

D. Bryant; B.Sc., Ph.D.(Canterbury)

X-W. Chang; B.Sc., M.Sc.(Nanjing), Ph.D.(McG.)

K. Driesen; Licentiate, M.A.(Free Brussels), Ph.D.(UC- Barbara)

M.T. Hallett; B.Sc.(Queens), Ph.D.(Vic. B.C.)

B. Kemme; B.Sc., M.Sc.(U. of Erlangen-Nuremberg), Ph.D.(ETH, Zurich)

J. Kienzle; Eng.Dip., Ph.D.(Swiss Fed. I.T.)

A. Klein; B.A.(Stan.) M.A., Ph.D.(Prin.)

M. Langer; B.Sc.(McG.), M.Sc.(Tor.), Ph.D.(McG.)

M. Maheswaran; B.Sc.(Peradeniya), M.Sc., Ph.D.(Perdue)

D. Precup; B.Sc.(Tech. U. of Cluj-Napoca), M.Sc., Ph.D.(Mass, Amherst)

K. Siddiqi; B.Sc.(Lafayette), M.Sc., Ph.D.(Brown)

H. Vangheluwe; B.Sc., M.Sc., D.Sc.(Ghent)

C. Verbrugge; B.A.(Queen's), Ph.D.(McG.)

#### Faculty Lecturer

J. Vybihal; M.Sc.(McG.)

#### Associate Member

T.R. Shult

#### Adjunct Professors

S. Brands, R. De Mori, K. El Emam, S. Hyder, K. Paton,

J-M. Robert

## 19 Computer Science

School of Computer Science  
McConnell Engineering, Room 318  
3480 University Street  
Montreal, QC H3A 2A7  
Canada

Telephone: (514) 398-7071 ext. 3744

Fax: (514) 398-3883

E-mail: [grad-sec@cs.mcgill.ca](mailto:grad-sec@cs.mcgill.ca)

Web site: [www.cs.mcgill.ca](http://www.cs.mcgill.ca)

Director — D. Thérien

Chairs of Graduate Programs:

M.Sc. — T. Merrett

Ph.D. — G. Toussaint

### 19.1 Staff

#### Emeritus Professor

C. Paige; B.Sc., B. Eng.(Sydney), Ph.D.(Lond.)

#### Professors

D. Avis; B.Sc.(Wat.), Ph.D.(Stan.)

L. Devroye; M.S.(Louvain), Ph.D.(Texas)

K. Fukuda; M.Sc., Ph.D.(Admin. Eng, KEIO), Ph.D.(Waterloo)

### 19.2 Programs Offered

Master's in Computer Science (Thesis Option), including the Computational Science and Engineering (CSE) option.

Master's in Computer Science (Project Option)

Ph.D. in Computer Science

### 19.3 Admission Requirements

#### Master's (M.Sc.)

The minimum requirement for admission is a bachelor's degree (CGPA 3.2 or better, or equivalent) with the course work in Computer Science indicated in the brochure "Information for Applicants to Graduate Programs".

The brochure supplements information in this Calendar and should be consulted by all graduate students.

#### Ph.D.

Candidates who do not hold a Master's degree from a recognized department of Computer Science will normally first register for the M.Sc.

Candidates with excellent standing in the M.Sc. program may be allowed to proceed to the Ph.D. degree without first submitting a Master's thesis; however, in other cases, permission to proceed to the Ph.D. may depend on the standing obtained in the M.Sc. Exceptional candidates who do not hold a Master's degree in Computer Science are, on rare occasions, admitted directly to the Ph.D. program.

## 19.4 Application Procedures

Applications will be considered upon receipt of:

1. application form
2. transcripts
3. letters of reference
4. \$60 application fee
5. test results (GRE, TOEFL)

All information is to be submitted directly to the Graduate Secretary.

**Deadline(s):** February 1st (if applicant wishes to be considered for scholarship awards); April 1st. Application documents are also available at our Web site: [www.cs.mcgill.ca/acadpages/grad/apply.html](http://www.cs.mcgill.ca/acadpages/grad/apply.html).

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

## 19.5 Program Requirements

### MASTER'S

The M.Sc. program has two options, a thesis and a project option. All students are required to take a reading course during their first year. In addition, the M.Sc. Thesis option (49 credits) requires six courses and a thesis, and the M.Sc. Project (non-thesis) option (46 credits) requires nine courses and a project. Courses will be chosen with guidance from an academic adviser, subject to approval by the School.

Available under the M.Sc. Thesis option is the following multi-disciplinary Computational Science and Engineering (CSE) option.

#### M.Sc. Thesis - CSE Option (50 credits)

##### Required Courses (29 credits)

COMP 601	(4)	Special Topics in Computer Science
COMP 698	(9)	Thesis Research 1
COMP 699	(15)	Thesis Research 2
MATH 669D1	(.5)	CSE Seminar
MATH 669D2	(.5)	CSE Seminar

##### Complementary Courses (minimum 21 credits)

Two courses from List A, two courses from List B, and the remaining credits to be chosen from graduate (500, 600 or 700-level) courses in the School of Computer Science. Two complementary courses must be taken outside the School of Computer Science.

##### List A - Scientific Computing Courses:

CIVE 602	(4)	Finite Element Analysis
COMP 522	(4)	Modelling and Simulation
COMP 540	(3)	Matrix Computations
COMP 566	(3)	Discrete Optimization 1
MATH 578	(4)	Numerical Analysis 1
MATH 579	(4)	Numerical Differential Equations

##### List B - Applications and Specialized methods Courses:

ATOC 512	(3)	Atmospheric and Oceanic Dynamics
ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
CIVE 514	(3)	Structural Mechanics
CIVE 572	(3)	Computational Hydraulics
CIVE 603	(4)	Structural Dynamics
CIVE 613	(4)	Numerical Methods: Structural Engineering
COMP 505	(3)	Advanced Computer Architecture
COMP 557	(3)	Computer Graphics
COMP 558	(3)	Fundamentals of Computer Vision
COMP 567	(3)	Discrete Optimization 2
COMP 621	(4)	Optimizing Compilers
COMP 642	(4)	Numerical Estimation
ECSE 507	(3)	Optimization and Optimal Control
ECSE 532	(3)	Computer Graphics
ECSE 547	(3)	Finite Elements in Electrical Engineering
ECSE 549	(3)	Expert Systems in Electrical Design

MATH 555	(4)	Fluid Dynamics
MATH 560	(4)	Optimization
MATH 651	(4)	Asymptotic Expansion and Perturbation Methods
MECH 533	(3)	Subsonic Aerodynamics
MECH 537	(3)	High-Speed Aerodynamics
MECH 538	(3)	Unsteady Aerodynamics
MECH 539	(3)	Computational Aerodynamics
MECH 541	(3)	Kinematic Synthesis
MECH 545	(3)	Advanced Stress Analysis
MECH 572	(3)	Introduction to Robotics
MECH 573	(3)	Mechanics of Robotic Systems
MECH 576	(3)	Computer Graphics and Geometrical Modelling
MECH 577	(3)	Optimum Design
MECH 610	(4)	Fundamentals of Fluid Dynamics
MECH 620	(4)	Advanced Computational Aerodynamics
MECH 632	(4)	Theory of Elasticity
MECH 642	(4)	Advanced Dynamics
MECH 650	(4)	Heat Transfer
MECH 654	(4)	Compt. Fluid Flow and Heat Transfer

### PH.D.

Candidates must fulfill the requirements outlined in the General Information section of the *Graduate and Postdoctoral Studies Calendar*. They must successfully complete courses (determined by their Progress Committee), the Ph.D. Comprehensive exam, the Ph.D. thesis proposal exam, a yearly Progress Report before their Progress Committee, and submit a Ph.D. thesis. There is no language requirement.

## 19.6 Courses

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

**Note:** All undergraduate courses administered by the Faculty of Science (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.

**COMP 505 ADVANCED COMPUTER ARCHITECTURE.** (3) (Fall) (3 hours) (Prerequisites: COMP 302 and COMP 273 or equivalent) Basic principles and techniques in the design of high-performance computer architecture. Topics include memory architecture: cache structure and design, virtual memory structures; pipelined processor architecture: pipeline control and hazard resolution, pipelined memory structures, interrupt, evaluation techniques; vector processing; RISC vs. CISC architectures; general vs. special purpose architectures; VLSI architecture issues.

**COMP 506 ADVANCED ANALYSIS OF ALGORITHMS.** (3) (Winter) (3 hours) (Prerequisite: COMP 330 or COMP 360 or COMP 405 or COMP 431) The study of computational complexity and intractability: Cook's Theorem, NP-completeness, oracles, the polynomial hierarchy, lower bounds, heuristics, approximation problems.

**COMP 507 COMPUTATIONAL GEOMETRY.** (3) (Fall) (3 hours) (Prerequisite: COMP 360 or COMP 405 or equivalent or corequisite COMP 506) Problems in computational geometry; worst-case complexity of geometric algorithms; expected complexity of geometric algorithms and geometric probability; geometric intersection problems; nearest neighbor searching; point inclusion problems; distance between sets; diameter and convex hull of a set; polygon decomposition; the Voronoi diagram and other planar graphs; updating and deleting from geometric structures.

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

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

● **COMP 524 THEORETICAL FOUNDATIONS OF PROGRAMMING LANGUAGES.** (3) (Fall) (3 hours) (Prerequisite: COMP 302, and MATH 340 or MATH 235)

● **COMP 525 FORMAL VERIFICATION.** (3) (Winter) (3 hours) (Prerequisites: COMP 251, COMP 310, COMP 330 and MATH 340)

**COMP 526 PROBABILISTIC REASONING AND AI.** (3) (Winter) (3 hours) (Prerequisites: COMP 206, COMP 360, COMP 424 and MATH 323) Belief networks, Utility theory, Markov Decision Processes and Learning Algorithms.

**COMP 531 THEORY OF COMPUTATION.** (3) (Winter) (3 hours) (Prerequisite: COMP 330) Models for sequential and parallel computations: Turing machines, boolean circuits. The equivalence of various models and the Church-Turing thesis. Unsolvable problems. Model dependent measures of computational complexity. Abstract complexity theory. Exponentially and super-exponentially difficult problems. Complete problems.

**COMP 533 OBJECT-ORIENTED SOFTWARE DEVELOPMENT.** (3) (Prerequisites: COMP 335 or ECSE 321) Object-oriented, UML-based software development; requirements engineering based on use cases; using OCL and a coherent subset of UML to establish complete and precise analysis and design documents for a software system; Java-specific mapping strategies for implementation.

● **COMP 534 TEAM SOFTWARE ENGINEERING.** (3) (Winter) (3 hours) (Prerequisite: COMP 433 or equivalent)

**COMP 535 COMPUTER NETWORKS 1.** (3) (Fall) (3 hours) (Prerequisite: COMP 310) (Students may not take COMP 435 and COMP 535 for credit) Exposition of the first four layers of the ISO model for computer network protocols, i.e., the physical, data, network, and transport layers. Basic hardware and software issues with examples drawn from existing networks, notably SNA, DECnet, and ARPAnet.

**COMP 537 INTERNET PROGRAMMING.** (3) (Winter) (3 hours) (Prerequisites: COMP 251 and COMP 302, and any one of COMP 310, COMP 420, COMP 424, or COMP 433) Sockets, User Datagram Protocol (UDP), Transmission utility protocols; Remote Terminal Protocol (Telnet), Simple Mail Transfer Protocol (SMTP), File Transfer Protocol (FTP) Hypertext Transfer Protocol (HTTP), Internet resource database and search engines. Remote File Systems. Distributed objects, Common Object Request Broker Architecture (CORBA).

● **COMP 538 PERSON-MACHINE COMMUNICATION.** (3) (Winter) (3 hours) (Prerequisites: COMP 251, COMP 302)

**COMP 540 MATRIX COMPUTATIONS.** (3) (Winter) (3 hours) (Prerequisite: MATH 327 or COMP 350) Designing and programming reliable numerical algorithms. Stability of algorithms and condition of problems. Reliable and efficient algorithms for solution of equations, linear least squares problems, the singular value decomposition, the eigenproblem and related problems. Perturbation analysis of problems. Algorithms for structured matrices.

**COMP 547 CRYPTOGRAPHY AND DATA SECURITY.** (3) (Fall) (3 hours) (Prerequisite: COMP 360) (Restriction: Not open to students who have taken 308-647) This course presents an in-depth study of modern cryptography and data security. The basic information theoretic and computational properties of classical and modern cryptographic systems are presented, followed by a cryptanalytic examination of several important systems. We will study the applications of cryptography to the security of systems.

**COMP 557 COMPUTER GRAPHICS.** (3) (Winter) (3 hours) (Prerequisite: MATH 223 and COMP 251) The study of fundamental mathematical, algorithmic and representational issues in computer graphics. The topics to be covered are: overview of graphics process, projective geometry, homogeneous coordinates, projective transformations, quadrics and tensors, line-drawing, surface modelling and object modelling reflectance models and rendering, texture mapping, polyhedral representations, procedural modelling, and animation.

**COMP 558 FUNDAMENTALS OF COMPUTER VISION.** (3) (Winter) (3 hours) (Prerequisites: COMP 206, COMP 360, MATH 222, MATH 223) (Restriction: not open to students who have taken 308-766 before January 2001) Biological vision, edge detection, projective geometry and camera modeling, shape from shading and texture, stereo vision, optical flow, motion analysis, object representation, object recognition, graph theoretic methods, high level vision, applications.

● **COMP 560 GRAPH ALGORITHMS AND APPLICATIONS.** (3) (Fall) (3 hours) (Prerequisite: COMP 360 or COMP 431 or MATH 343)

**COMP 562 COMPUTATIONAL BIOLOGY METHODS.** (3) (Fall) (3 hours) (Prerequisites: COMP 330, COMP 350, COMP 360 and MATH 323) Application of computer science techniques to problems arising in biology and medicine, techniques for modeling evolution, aligning molecular sequences, predicting structure of a molecule and other problems from computational biology.

**COMP 566 DISCRETE OPTIMIZATION 1.** (3) (Fall) (3 hours) (Prerequisites: COMP 360 and MATH 223) Use of computer in solving problems in discrete optimization. Linear programming and extensions. Network simplex method. Applications of linear programming. Vertex enumeration. Geometry of linear programming. Implementation issues and robustness. Students will do a project on an application of their choice.

**COMP 567 DISCRETE OPTIMIZATION 2.** (3) (Winter) (3 hours) (Prerequisites: COMP 566 or MATH 417) Formulation, solution and applications of integer programs. Branch and bound, cutting plane, and column generation algorithms. Combinatorial optimization. Polyhedral methods. A large emphasis will be placed on modeling. Students will select and present a case study of an application of integer programming in an area of their choice.

**COMP 573 MICROCOMPUTERS.** (3) (Fall or Winter) (3 hours) (Prerequisite: COMP 273) Characteristics and internal structure of microcomputers and workstations. Architectures of current CISC and RISC micro processors. Assembler and machine languages for microcomputers. System software. Applications for single and networked microcomputers. Students will be assigned "hands-on" projects.

**COMP 575 FUNDAMENTALS OF DISTRIBUTED ALGORITHMS.** (3) (Winter) (3 hours) (Prerequisite: COMP 310) Study of a collection of algorithms which are basic to the world of concurrent programming. Discussion of algorithms from the following areas: termination detection, deadlock detection, global snapshots, clock synchronization, fault tolerance (byzantine and self-stabilizing systems). Students will implement algorithms on the BBN butterfly and will present papers on topics in these areas.

**COMP 577 DISTRIBUTED DATABASE SYSTEMS.** (3) (Fall) (3 hours) (Prerequisites: COMP 421 and COMP 310) Issues related to distributed database both from a theoretical and practical point of view. Fundamental problems of distributed systems such as time or failure, distributed transaction management, fault-tolerance, replication, data distribution, and system architecture and design.

**COMP 601 SPECIAL TOPICS IN COMPUTER SCIENCE.** (4)  
May be offered as: COMP 601D1 and COMP 601D2,  
or COMP 601N1 and COMP 601N2.

● **COMP 605 PARALLEL COMPUTER ARCHITECTURE.** (4) (3 hours)

**COMP 610 INFORMATION STRUCTURES 1.** (4) (3 hours) Study of elementary data structures: lists, stacks, queues, trees, hash tables, binary search trees, red-black trees, heaps. Augmenting data structures. Sorting and selection, Recursive algorithms. Advanced data structures including binomial heaps, Fibonacci

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 PROCESS 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 PERCEPTION.** (4) (3 hours) Seminar course on perception problems from a computer science perspective. Vision problems such as stereo, shading, motion, color, object recognition. Audition problems such as sonar, source localization, source recognition.

**COMP 647 ADVANCED CRYPTOGRAPHY.** (4) (3 hours) (Prerequisite: COMP 547) (Prerequisite: COMP 547) Information theoretic definitions of security, zero-knowledge protocols, secure function evaluation protocols, cryptographic primitives, privacy amplification, error correction, quantum cryptography, quantum cryptanalysis.

**COMP 648 MOTION PLANNING AND ROBOTICS.** (4) (3 hours) (Given in alternate years.) Topics in motion planning, including: algorithms and complexity results for collision avoidance; the configuration space approach; the algebraic cell decomposition approach; motion planning using Voronoi diagrams; object representation schemes.

**COMP 652 MACHINE LEARNING.** (4) (Prerequisites: COMP 424, COMP 526 or ECSE 526, COMP 360, MATH 323 or ECSE 305.) An overview of state-of-the-art algorithms used in machine learning, including theoretical properties and practical applications of these algorithms.

**COMP 656 RUN-TIME LANGUAGE SUPPORT.** (4) Hardware and software support for late binding, polymorphic calls and garbage collection in object-oriented languages.

**COMP 667 SOFTWARE FAULT TOLERANCE.** (3) (Prerequisite: COMP 409 or permission of instructor) Software fault tolerance, concepts and implementation.

● **COMP 675 PARALLEL SEARCH PROBLEMS.** (4) (3 hours)

**COMP 690 PROBABILISTIC ANALYSIS OF ALGORITHMS.** (4) (3 hours) Probabilistic analysis of algorithms and data structures under random input. Expected behavior of search trees, tries, heaps, bucket structures and multidimensional data structures. Random sampling, divide-and-conquer, grid methods. Applications in computational geometry and in game tree searching. Combinatorial search problems. Algorithms on random graphs.

**COMP 694 RESEARCH PROJECT 1.** (6) (Restricted to Computer Science students) Ongoing research pertaining to project.

**COMP 695 RESEARCH PROJECT 2.** (6) (Restricted to Computer Science students) Ongoing research pertaining to project.

**COMP 698 THESIS RESEARCH 1.** (9) (Restricted to Computer Science students) Ongoing research pertaining to thesis.

**COMP 699 THESIS RESEARCH 2.** (15) (Restricted to Computer Science students) Ongoing research pertaining to thesis.

**COMP 700 PH.D. COMPREHENSIVE EXAMINATION.** (0)

May be offered as: **COMP 700D1** and **COMP 700D2.**

**COMP 701 THESIS PROPOSAL AND AREA EXAMINATION.** (3)

**COMP 760 ADVANCED TOPICS THEORY 1.** (4)

**COMP 761 ADVANCED TOPICS THEORY 2.** (4) (Topics for Fall 2003: Section 1 - Polyhedral graph theory. Section 2 - Percolation.)

**COMP 762 ADVANCED TOPICS PROGRAMMING 1.** (4)

**COMP 763 ADVANCED TOPICS PROGRAMMING 2.** (4)

**COMP 764 ADVANCED TOPICS SYSTEMS 1.** (4)

**COMP 765 ADVANCED TOPICS SYSTEMS 2.** (4)

**COMP 766 ADVANCED TOPICS APPLICATIONS 1.** (4) (Topics for Fall 2003: Section 1 - Distributed simulation. Section 2 - Shape analysis in computer vision.)

**COMP 767 ADVANCED TOPICS: APPLICATIONS 2.** (4)

## 20 Dentistry

Department of Dentistry  
Faculty of Dentistry  
3640 University Street, Room M18  
Montreal, QC H3A 2B2  
Canada

Telephone: (514) 398-7203  
Fax: (514) 398-8900  
Web site: [www.mcgill.ca/dentistry](http://www.mcgill.ca/dentistry)

*Dean, Faculty of Dentistry* — J.P. Lund

*Associate Dean, Research* — M.D. McKee

*Director, Graduate Studies* — J.S. Feine

*Director, Graduate Program in Oral and Maxillofacial Surgery* —  
T.W. Head

### 20.1 Staff

#### *Professors*

M.C. Bushnell; B.A.(Maryland), M.A., Ph.D.(American U.)  
F. Cervero; M.B., Ch.B., Ph.D.(Madrid), D.Sc.(Edin.)  
J.S. Feine; D.D.S., M.S.(Texas), H.D.R.  
J.P. Lund; B.D.S.(Adel.), Ph.D.(W.Ont.)  
C.E. Smith; D.D.S., Ph.D.(McG.)

**Associate Professors**

P.J. Allison; B.D.S., F.D.S.R.C.S., M.Sc.(Lond.), Ph.D.(McG.)  
 G. Bennett; B.A.(Rutgers), M.A., Ph.D.(Va.)  
 P.J. Chauvin; B.Sc.,D.D.S.(McG.), M.Sc.(W.Ont.), F.A.A.O.P.,  
 F.R.C.D.(C)  
 M. Dagenais; D.M.D.(Montr.), Dip. Oral Radiology(Tor.)  
 T.W. Head; B.Sc.(Sir G. Wms.), D.D.S., M.Sc.(McG.), F.R.C.D.(C),  
 Dipl. A.B.O.M.S.  
 M.D. McKee; Ph.D.(McG.)  
 S. Schwartz; D.M.D.(Montr.), M.Sc. Cert. Pedo.(Boston), F.I.C.D.,  
 F.A.C.D.  
 E.D. Shields; B.Sc.(Ball State), D.D.S., Ph.D.(Ind.)

**Assistant Professors**

J.R. Emery; D.D.S., M.Sc.(McG.), F.R.C.D.(C), Dipl. A.B.O.M.S.  
 M.T. Kaartinen; M.Sc.(Jyväskylä), Ph.D.(Kuopio, Finland)  
 H. LeMoual; D.E.A., M.Sc.(Paris), Ph.D.(Montr.)  
 J.-M. Retrouvey; D.M.D.(Montr.), M.Sc.(Boston)  
 M. Tabrizian; D.E.A., Ph.D.(Paris)

**Adjunct Professors**

A. Charbonneau; D.M.D., M.Sc., Ph.D.(Montr.)  
 S. Marchand; (UQAT), M.Sc.(UQTR), Ph.D.(Montr.)  
 J. Morais; M.D.(Montr.)  
 D.J. Ostry; B.A.Sc., M.A.Sc., Ph.D.(Tor.)

**Associate Members**

E.L. Franco; B.Sc.(Estadual de Campinas), M.P.H.,  
 Dr.P.H.(Chapel Hill)  
 E.G. Gisel; B.S.(Zurich), B.S., M.S., Ph.D.(Temple)  
 J. Penrod; M.D.(Stan.), Ph.D.(Prin.)  
 H. Warshawsky; B.Sc.(Sir G.Wms.), M.Sc., Ph.D.(McG.)

**20.2 Programs Offered****M.Sc. in Dental Sciences**

The goal of this program is to train students in research in the dental sciences which comprise a number of disciplines relating to the functioning of the oro-facial complex.

Please consult the Graduate Secretary, Faculty of Dentistry, for further details.

**M.Sc. in Dental Sciences, option in Oral and Maxillofacial Surgery**

A residency training program in Oral and Maxillofacial Surgery provides a candidate with a comprehensive background for the practice of Oral and Maxillofacial Surgery as a specialty.

During the four years of the program the candidate serves as a resident principally at the Montreal General Hospital. During this time the resident is given increasing responsibility for the care of in-patients and out-patients, as well as being required to fulfill certain basic science courses and other assignments. A research project must be undertaken, followed by a Master's thesis.

The program is open to one candidate per year.

**20.3 Admission Requirements****M.Sc. in Dental Sciences**

Students who have successfully completed the D.D.S./D.M.D. degree or a B.Sc. degree with a CGPA of 3.0 on 4.0 in any of the disciplines in the Health Sciences (Anatomy, Biochemistry, Microbiology and Immunology, Physiology) or related disciplines (Biology, Chemistry, Physics, Psychology) are eligible to apply for admission to a graduate program in the Faculty of Dentistry leading to the M.Sc. degree in Dental Sciences. In addition to submitting GRE scores, TOEFL tests must be passed in the case of non-Canadians whose mother tongue is not English.

The number of candidates accepted each year will depend on the elective courses and research facilities available which are applicable to the candidate's area of expertise.

**M.Sc. in Dental Sciences, option in Oral and Maxillofacial Surgery**

Candidates for this program must possess a D.D.S. or D.M.D. degree or its equivalent, and be acceptable to l'Ordre des Dentistes du Québec as a training candidate in a hospital.

**20.4 Application Procedures**

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

**M.Sc. in Dental Sciences**

All applications must include an up-to-date official transcript of academic performance, two letters of recommendation and a brief resume indicating their particular field of interest for the M.Sc. degree. B.Sc. students who have not obtained eligible qualifications will be required to make up for deficiencies in their academic profile by taking a qualifying year.

Students must be accepted by a research director before the Faculty approves the application, prior to final acceptance by the Graduate and Postdoctoral Studies Office.

Applications may be obtained by writing to the Graduate Program in Dental Sciences, Faculty of Dentistry.

**Deadlines** for receipt of the application on-line are as follows:

Fall Term – March 1  
 Winter Term – September 1  
 Summer Term – November 1

**M.Sc. in Dental Sciences, option in Oral and Maxillofacial Surgery**

Applications must be submitted by September 15.

Information for financial support for this program may be obtained by writing to Dr. T.W. Head, Director of the program.

Further information may be obtained by writing to Graduate Program in Oral and Maxillofacial Surgery, Faculty of Dentistry.

**20.5 Program Requirements**

All students who are registered in Graduate Clinical Programs in the Faculty of Dentistry, McGill University, and who are not already registered with l'Ordre, must register with l'Ordre des Dentistes du Québec. Further information may be obtained from the Registrar of l'Ordre des Dentistes du Québec, 625 René-Lévesque Boulevard West, 15th Floor, Montreal, QC H3B 1R2.

**M.SC. IN DENTAL SCIENCES**

The M.Sc. degree should normally be completed within two years of full-time study.

**Required Courses (8 credits)**

EPIB 607 (4) Inferential Statistics (or equivalent course)  
 DENT 671D1 (2) Advanced Research Seminar  
 DENT 671D2 (2) Advanced Research Seminar

**Complementary Courses (8 – 14 credits)**

chosen from the following:

ANAT 632D1 (3) Experimental Morphology  
 ANAT 632D2 (3) Experimental Morphology  
 ANAT 663D1 (4.5) Histology  
 ANAT 663D2 (4.5) Histology  
 BIOC 404 (3) Biophysical Chemistry  
 BIOC 450 (3) Protein Structure and Function  
 BIOC 454 (3) Nucleic Acids  
 BIOC 456 (3) Biochemistry of Membranes  
 BIOL 524 (3) Topics in Molecular Biology  
 DENT 562 (3) Calcified Tissues  
 DENT 654 (3) Mechanisms and Management of Pain  
 EPIB 606 (4) Introduction to Epidemiology  
 EPIB 611 (3) Study Design and Analysis 1  
 EPIB 621 (3) Data Analysis Health Sciences 1  
 EPIB 635 (3) Clinical Trials  
 EPIB 655 (3) Epidemiology in Public Health  
 EPIB 681 (3) Data Analysis Health Sciences 2

EXMD 610	(3)	Biomedical Methods in Medical Research
POTH 630	(3)	Measurement: Rehabilitation 2
PSYC 505	(3)	The Psychology of Pain

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:

DENT 650	(3)	Thesis Research 1
DENT 651	(6)	Thesis Research 2
DENT 652	(9)	Thesis Research 3
DENT 653	(15)	Thesis Research 4

#### 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)

DENT 631	(3)	OMFS 2 Seminar
DENT 632	(3)	Clinical OMFS 2
DENT 641	(3)	OMFS 3 Seminar
DENT 642	(3)	Clinical OMFS 3
EPIB 607	(4)	Inferential Statistics (or equivalent course)

#### Thesis Component – Required (30 credits)

DENT 651	(6)	Thesis Research 2
DENT 652	(9)	Thesis Research 3
DENT 653	(15)	Thesis Research 4

### 20.6 Courses for the M.Sc. in Dental Sciences

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.

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.

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

● Denotes courses not offered in 2003-04.

● **DENT 504 BIOMATERIALS AND BIOPERFORMANCE.** (3) Biological and synthetic biomaterials, medical devices, and the issues related to their bioperformance. The physicochemical characteristics of biomaterials in relation to their biocompatibility and sterilization.

**DENT 631 OMFS 2 SEMINAR.** (3)

**DENT 632 CLINICAL OMFS 2.** (3)

**May be offered as: DENT 632D1 and DENT 632D2.**

**DENT 650 THESIS RESEARCH 1.** (3) Independent work under the direction of a supervisor on a research problem in the student's designated area of research: Literature Review and Hypothesis Generation.

**DENT 651 THESIS RESEARCH 2.** (6) Independent work under the direction of a supervisor on a research problem in the student's designated area of research: Literature Review and Protocol Development.

**DENT 652 THESIS RESEARCH 3.** (9) Independent work under the direction of a supervisor on a research problem in the student's designated area of research.

**May be offered as: DENT 652D1 and DENT 652D2.**

**DENT 653 THESIS RESEARCH 4.** (15) Independent work under the direction of a supervisor on a research problem in the student's designated area of research: Data Analysis & Thesis Preparation.

**May be offered as: DENT 653D1 and DENT 653D2**

**or DENT 653J1, DENT 653J2 and DENT 653J3.**

**DENT 654 MECHANISMS AND MANAGEMENT OF PAIN.** (3) (Open to all health professionals) Presentation of the neurobiology of pain and analgesia, clinical pain conditions, basic and applied research methods in the study of pain, and the theory and practice of pain management. The course is designed for graduate students interested in pain mechanisms and clinical residents interested in pain management.

**DENT 671D1 ADVANCED RESEARCH SEMINAR.** (2) Topics in current research in Oral Health Sciences.

**DENT 671D2 ADVANCED RESEARCH SEMINAR.** (2)

**May be offered as: DENT 671 or DENT 671N1 and DENT 671N2**

## 21 Developing-Area Studies

Centre for Developing-Area Studies (CDAS)

3715 Peel Street

Montreal, QC H3A 1X1

Canada

Telephone: (514) 398-3507

Fax: (514) 398-8432

E-mail: [adm.cdass@mcgill.ca](mailto:adm.cdass@mcgill.ca)

Web site: [www.mcgill.ca/cdas](http://www.mcgill.ca/cdas)

*Director* — Rosalind E. Boyd, Ph.D.

*Documentalist* — Iain Blair

E-mail: [doc.cdass@mcgill.ca](mailto:doc.cdass@mcgill.ca)

*Adjunct Professor* — Izzud-Din Pal, Ph.D.

*Senior Research Associate* — Myriam Gervais, Ph.D.

The CDAS conducts research on social, political, and economic problems within countries in Africa, Asia, the Caribbean, Latin America and the Middle East, from an interdisciplinary perspective. It organizes seminars and conferences on development issues and globalization, primarily in the social sciences.

The CDAS has a specialized library (the Gutkind Library), open to the public. In addition, it maintains an active publications program centred around the internationally respected journal *Labour, Capital and Society* and has research fellows and research groups in residence.

The CDAS works with an international community of scholars, development groups and the public, and is currently involved in a series of research and development projects focusing on gender, environment, the labouring poor, human security, and globalization.

Graduate students with research interests in international development can apply to become fellows.

## 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](http://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 appoint. with Natural Resource Sciences, and Food Science and Agricultural Chemistry*) (*NSERC Northern Chair*)

Grace Egeland; B.A.(Luther College), Ph.D.(Pitts.) (*Canada Research Chair*)

Katherine Gray-Donald; B.Sc., Ph.D.(McG.) (*joint appoint. with Epidemiology and Biostatistics, Faculty of Medicine*)

Kristine G. Koski; B.S., M.S.(Wash.), Ph.D.(Calif.) (*joint appoint. with the Division of Experimental Medicine, Faculty of Medicine*)

Stan Kubow; B.Sc.(McG.), M.Sc.(Tor.), Ph.D.(Guelph)

Louise Thibault; B.Sc., M.Sc., Ph.D.(Laval)

Linda J. Wykes; B.Sc., M.Sc., Ph.D.(Tor.) (*William Dawson Scholar*)

#### Faculty Lecturers

Linda Jacobs Starkey; B.Sc.(Mt. St. Vincent), M.Sc., Ph.D.(McG.)  
(*University Coordinator, Professional Practice (Stage) in Dietetics*)

Maureen Rose-Lucas; B.Sc., M.Sc., Ph.D.(McG.)

#### Associate Members

Anaesthesia: Franco Carli

Food Science & Agricultural Chemistry: Selim Kermasha

Parasitology: Marilyn E. Scott

Psychiatry: Simon N. Young

Medicine: Louis Beaumier, Katherine Cianflone,  
Rejeanne Gougeon, L.John Hoffer, Errol B. Marliss,  
Jean-François Yale

#### Adjunct Professors

Kevin A. Cockell (Health Canada), Jeffrey S. Cohn (Clinical Research Inst. of Canada), Mary L'Abbé (Health Canada)

### 22.2 Programs Offered

M.Sc., M.Sc. Applied and Ph.D. in Human Nutrition.

The M.Sc. and Ph.D. programs are research degrees wherein students conduct research with one of the faculty members. Most areas of research in Human Nutrition are covered including nutritional biochemistry, clinical nutrition, community or international nutrition. Prospective students are encouraged to contact faculty members to discuss potential research areas since final acceptance requires identification of a research supervisor.

The M.Sc. Applied is intended to provide advanced learning in Nutrition with substantial course work and either a *practicum in*

*the field of Dietetics or a project in the area of Human Nutrition.* Students need not define their research area prior to enrolment.

Research Facilities: Students may conduct research at the School of Dietetics and Human Nutrition, including the Mary Emily Clinical Nutrition Research Unit, the Centre for Indigenous Peoples' Nutrition and Environment (CINE), or at the McGill University Health Centre.

In addition to their research, eligible candidates may complete the equivalent of a Dietetics Internship for membership in the professional association for registration as Dietitians and Nutritionists in Canada. However, completion of specific undergraduate dietetics course work and practica will increase the duration and cost of the program.

### 22.3 Admission Requirements

#### M.Sc.

Applicants must be graduates of a university of recognized reputation and hold a B.Sc. degree equivalent to a McGill Honours degree in a subject closely related to the one selected for graduate work. Applicants must have at least a cumulative grade point average (CGPA) in McGill University's credit equivalency of 3.2/4.0 (second class-upper division) during the last four full-time terms of a completed Bachelor's degree program in nutrition or a closely related field. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program.

Students with limitations in their academic background may be admitted into a qualifying program for a maximum of two terms if they have met the School's minimum CGPA of 3.2 of 4.0. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

#### M.Sc. (Applied)

Applicants to the M.Sc. Applied project or practicum options must have a B.Sc.(Nutritional Sciences) or equivalent with a GPA of 3.2 or higher. The program is available to students who do not have a working knowledge of French, however, not all project or practicum opportunities will be open to them.

All eligible candidates may select the project option. The project option may also serve as a route to dietetics credentialing for some candidates. Applicants who have completed a dietetics internship and six months' work experience are eligible for the practicum option.

#### Ph.D.

Admission for Ph.D. studies normally requires a M.Sc. degree in an area related to the chosen field of specialization.

### 22.4 Application Procedures

Applicants for graduate studies through academic units in the Faculty of Agricultural and Environmental Sciences must forward supporting documents to:

Student Affairs Office (Graduate Studies)  
Macdonald Campus of McGill University  
21,111 Lakeshore  
Sainte-Anne-de-Bellevue, QC H9X 3V9  
Canada

Telephone: (514) 398-7925

Fax: (514) 398-7968

E-mail: [grad@macdonald.mcgill.ca](mailto:grad@macdonald.mcgill.ca)

Applications will be considered upon receipt of a completed application form, \$60 application fee, current resumé, statement describing reasons for interest in the program and career goals, 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 and GRE. 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](http://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.

**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 560 on the paper-based test, 220 on the computer-based) or IELTS (minimum overall band 6.5). The MCHE is not considered equivalent. The School reserves the right to request TOEFL results. Please contact the School for details. 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 required for all applicants to the School of Dietetics and Human Nutrition who are submitting non-Canadian and non-U.S. transcripts.

**Financial aid is very limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application.**

Acceptance to all programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support. Normally, a student will not be accepted unless adequate financial support can be provided by the student and/or the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships or other funds.

**Qualifying Students** – Some applicants whose academic degrees and standing entitle them to serious consideration for

admission to graduate studies, but who are considered inadequately prepared in the subject selected may be admitted to a *Qualifying Program*. The course(s) to be taken in a *Qualifying Program* will be prescribed by the academic unit concerned. *Qualifying students* are registered in graduate studies, **but not as candidates for a degree**. Only one qualifying year is permitted. **Successful completion of a qualifying program does not guarantee admission to a degree program.**

## 22.5 Program Requirements

### M.Sc.

Program requirements for the M.Sc. include a minimum of 45 credits. This is comprised of 31 credits for the thesis (NUTR 680, NUTR 681, NUTR 682, NUTR 683), two credits of required seminars (NUTR 695, NUTR 696), and four three-credit graduate courses. The student may be advised to take more than four courses.

### M.Sc. Applied

Program requirements for the M.Sc. Applied include a minimum of 45 credits. This is comprised of 29 course credits (nine three-credit courses and two credits of required seminars (NUTR 695, NUTR 696), and 16 credits of project or practicum courses.

### Ph.D.

Requirements for the Ph.D. include a course of study recommended by the committee including a comprehensive examination (NUTR 701), a research dissertation, and two credits of required seminars (NUTR 797, NUTR 798). Course work at the Ph.D. level normally comprises a smaller portion than for the M.Sc. degree. The research program must clearly show originality and be a contribution to knowledge. At least three years are required to meet the Ph.D. requirements. Outstanding students may be permitted to transfer to the Ph.D. program following the first year of M.Sc. study.

## 22.6 Courses

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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 only in alternate years.

● Denotes courses not offered in 2003-04. (Some courses are given every second year.)

Students may also take courses in other faculties such as Medicine or Education.

● ★ **NUTR 501 NUTRITION IN DEVELOPING COUNTRIES.** (3) (Fall) (2 lectures and one seminar) (Prerequisite: consent of instructor)

**NUTR 510 PROFESSIONAL PRACTICE - STAGE 4.** (14) (Fall) (Prerequisite: NUTR 409) (Restriction: Not open to students who have taken NUTR 410) Interrelated modules of directed experience in clinical nutrition, foodservice management, nutrition education and community nutrition, in health care setting and in the private sector.

★ **NUTR 511 NUTRITION AND BEHAVIOUR.** (3) (2 lectures and one seminar) (Prerequisite: consent of instructor) Discussion of knowledge in the area of nutrition and behaviour through lectures and critical review of recent literature; to discuss the theories and controversies associated with relevant topics; to understand the limitations of our knowledge. Topics such as diet and brain biochemistry, stress, feeding behaviour and affective disorders will be included.

**NUTR 512 HERBS, FOODS AND PHYTOCHEMICALS.** (3) (3 lectures and a project) An overview of the use of herbal medicines and food phytochemicals and the benefits and risks of their consump-

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 designs for research, sampling techniques, measurement and analysis issues and human research ethics.

**NUTR 608 SPECIAL TOPICS 1.** (3) (Prerequisite: permission of instructor and Director of School. Restricted to graduate students in Nutrition.) Prescribed reading, conference, lectures, assignments and/or practical work on selected topics in student's area of specialization. An approved course outline must be on file in the School's office prior to registration.

**NUTR 609 SPECIAL TOPICS 2.** (3) (Prerequisite: permission of instructor and Director of School. Restricted to graduate students in Nutrition.) An individualized course to allow students to undertake projects in library, laboratory, or field study. An approved course outline must be on file in the School's office prior to registration.

★ **NUTR 610 MATERNAL AND CHILD NUTRITION.** (3) Advanced discussion of the scientific basis for nutrient requirements during pregnancy, lactation, and infant nutrition in humans and comparative animal species; milk and formula composition; malnutrition and supplemental feeding programs in developed and developing countries; nutrient requirements and controversial issues in childhood and adolescent nutrition.

● ★ **NUTR 620 NUTRITION OF INDIGENOUS PEOPLES.** (3) (Prerequisite: One course in nutritional sciences.)

● ★ **NUTR 623 FUNCTIONAL FOODS.** (3) (Prerequisite: NUTR 207, NUTR 307 or equivalent)

**NUTR 651 M.Sc. (APPLIED) NUTRITION 1.** (3) (Corequisites: NUTR 606, NUTR 695) Review of literature and problem definition for both the project option or for placement preparation for practicum option. This course relates to the Human Nutrition M.Sc. (Applied) degree and is required for both project and practicum options.

**NUTR 652 M.Sc. (APPLIED) PROJECT 1.** (3) (Prerequisite: NUTR 651) Project design and planning.

**NUTR 653 M.Sc. (APPLIED) PROJECT 2.** (3) (Prerequisite: NUTR 652) Project execution. This project relates to the Human Nutrition M.Sc. (Applied) degree.

**NUTR 654 M.Sc. (APPLIED) PROJECT 3.** (3) (Prerequisite: NUTR 653) Continuation of project execution and data collection; preliminary analysis. This project relates to the Human Nutrition M.Sc. (Applied) degree.

**NUTR 655 M.Sc. (APPLIED) PROJECT 4.** (3) (Prerequisite: NUTR 654) Data analysis. Submission of project report. This project relates to the Human Nutrition M.Sc. (Applied) degree.

**NUTR 656 M.Sc. (APPLIED) PRACTICUM 1.** (3) (Prerequisite: NUTR 651) Clinical or community placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

**NUTR 657 M.Sc. (APPLIED) PRACTICUM 2.** (3) (Prerequisite: NUTR 656) Continuation of placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

**NUTR 658 M.Sc. (APPLIED) PRACTICUM 3.** (3) (Prerequisite: NUTR 657) Continuation of placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

**NUTR 659 M.Sc. (APPLIED) PRACTICUM 4.** (3) (Prerequisite: NUTR 658) Continuation of placement (4 weeks). Submission of placement report. This practicum relates to the Human Nutrition M.Sc. (Applied) degree.

**NUTR 660 M.Sc. (APPLIED) NUTRITION 2.** (1) (Prerequisites: NUTR 653; NUTR 659 or NUTR 655) Oral presentation. This presentation relates to the Human Nutrition M.Sc. (Applied) degree, project and practicum options.

**NUTR 680 HUMAN NUTRITION M.Sc. THESIS 1.** (6) Independent research under the direction of a supervisor toward completion of the M.Sc. thesis.

**May be offered as: NUTR 680D1 AND NUTR 680D2, OR NUTR 680N1 AND NUTR 680N2.**

**NUTR 681 HUMAN NUTRITION M.Sc. THESIS 2.** (6) Independent research under the direction of a supervisor toward completion of the M.Sc. thesis. Presentation of a thesis proposal.

**May be offered as: NUTR 681D1 AND NUTR 681D2, OR NUTR 681N1 AND NUTR 681N2.**

**NUTR 682 HUMAN NUTRITION M.Sc. THESIS 3.** (9) Independent research under the direction of a supervisor toward completion of the M.Sc. thesis.

**May be offered as: NUTR 682D1 AND NUTR 682D2, OR NUTR 682N1 AND NUTR 682N2.**

**NUTR 683 HUMAN NUTRITION M.Sc. THESIS 4.** (10) Final submission, thesis defense seminar and approval of the M.Sc. thesis.

**May be offered as: NUTR 683D1 AND NUTR 683D2, OR NUTR 683N1 AND NUTR 683N2.**

**NUTR 695 HUMAN NUTRITION SEMINAR 1.** (1) Students will present a recent original research article in which the methods and data presentation will be critically analyzed. The article must be approved by the instructor.

**NUTR 696 HUMAN NUTRITION SEMINAR 2.** (1) Students will present a recent original research article in which the methods and data presentation will be critically analyzed. The article must be approved by the instructor.

**NUTR 701 DOCTORAL COMPREHENSIVE EXAMINATION.** (0) (See Faculty Regulations)

**May be offered as: NUTR 701D1 AND NUTR 701D2.**

**NUTR 797 HUMAN NUTRITION SEMINAR 3.** (1) Doctoral candidates will present a recent original research article in which the methods and data presentation will be critically analyzed. The article must be approved by the instructor.

**NUTR 798 HUMAN NUTRITION SEMINAR 4.** (1) Doctoral candidates will present a group of recent research articles in which the methods and data presentation will be critically analyzed. The articles must be approved by the instructor.

## 23 Earth and Planetary Sciences

Department of Earth and Planetary Sciences  
Frank Dawson Adams Building  
3450 University Street  
Montreal, QC H3A 2A7  
Canada

Telephone: (514) 398-6767  
Fax: (514) 398-4680  
E-mail: carol.matthews@mcgill.ca  
Web site: [www.eps.mcgill.ca](http://www.eps.mcgill.ca)

Acting Chair — J. Stix

### 23.1 Staff

#### Emeritus Professors

E.W. Mountjoy; B.A.Sc.(Br.Col.), Ph.D.(Tor.)  
W.H. MacLean; B.Geol.Eng.(Colo. Sch. of Mines), M.Sc.(A),  
Ph.D.(McG.)  
C.W. Stearn; B.Sc.(McM.), M.S., Ph.D.(Yale), F.R.S.C.

#### Professors

J. Arkani-Hamed; B.Eng.(Tehran), Ph.D.(M.I.T.)  
D. Francis; B.Sc.(McG.), M.Sc.(Br.Col.), Ph.D.(M.I.T.)  
A.J. Hynes; B.Sc.(Tor.), Ph.D.(Cantab.)  
O.G. Jensen; B.Sc., M.Sc., Ph.D.(Br.Col.)  
R.F. Martin; B.Sc.(Ott.), M.S.(Penn. St.), Ph.D.(Stan.)  
A. Mucci; B.Sc., M.Sc.(Montr.), Ph.D.(Miami)  
A.E. Williams-Jones; B.Sc., M.Sc.(Natal), Ph.D.(Queen's)

#### Associate Professors

D. Baker; B.A.(Chic.), Ph.D.(Penn. St.)  
J. Paquette; B.Sc., M.Sc.(McG.), Ph.D.(Stonybrook)  
J. Stix; A.B.(Dart.), M.Sc., Ph.D.(Tor.)  
H. Vali; B.Sc., M.Sc., Ph.D.(Munich) (*Director, Electron  
Microscopy Centre*)

#### Assistant Professors

M. Best; B.Sc.(Laur.), Ph.D.(Chic.)  
B. Hart; B.A.(McM.), M.Sc.(UQAR), Ph.D.(W.Ont.)

#### Lecturer

S.T. Ahmedali

#### Associate Members

M. Bilodeau (Mining Engineering)  
B. Volesky (Chemical Engineering)

#### Adjunct Professors

H. Hofmann, B. Sundby

#### Research Associate

P. Lorrain

### 23.2 Programs Offered

Opportunities for advanced study and research in geology, geochemistry, geophysics, planetary sciences and oceanography are available to qualified students. Graduate programs leading to the M.Sc., and Ph.D. degrees are offered.

Financial assistance is available in the form of demonstratorships, research assistantships and scholarships.

#### AREAS OF RESEARCH

##### Economic Geology

Application of geochemistry in understanding the genesis of hydrothermal mineral deposits (Cu, Mo, W, Sn, Au, Ag, and REE), in particular those associated with felsic intrusives and carbonatites. Experimental simulations of fluid-rock interaction and investigation of metal solubility and speciation at elevated temperatures and pressures.

##### Environmental Geology and Low Temperature Geochemistry

Low-temperature geochemistry and chemical oceanography; chemical thermodynamics and kinetics of solid solution reactions

in natural environments; early diagenesis of marine, coastal, and estuarine sediments; crystal growth mechanisms in low-temperature aqueous solutions and their influence on element partitioning in minerals.

##### High-Temperature Geochemistry

Experimental and theoretical studies of melting and crystallization in oxide, silicate and sulfide systems at temperatures and pressures up to 2200°C and 5.5 Gpa. Spectroscopic studies of the structure of silicate melts and their transport properties, diffusion and viscosity. Effects of volatiles on the melting and crystallization of igneous systems.

##### Igneous Petrology

Orogenic and non-orogenic magmatism, alkali feldspars as indicators of magmatic and post-magmatic processes; high-temperature geochemistry, experimental investigation of petrogenetic processes, structure and properties of silicate melts and glasses, physical and chemical controls on volcanic eruptions.

##### Mineralogy/Crystal Chemistry

Studies of crystal growth mechanism of minerals, with emphasis on carbonate minerals, natural and synthetic, of sedimentary and hydrothermal origin. X-ray diffraction, electron probe microanalysis, atomic force microscopy and cathodoluminescence are used to study the influence of conditions of growth on the incorporation of trace elements, surface topography and crystal morphology.

##### Petroleum Geoscience

Integrated studies of hydrocarbon reservoirs using 3-D seismic data, borehole logs, core and outcrop analogues; reservoir compartmentalization by stratigraphic and structural features; attribute-based prediction of physical properties; naturally fractured tight-gas reservoirs.

##### Planetary Sciences

Geophysical potential fields, dynamics of planetary interiors; global geodynamics and physics of Earth's interior; seismology – tectonophysics, geophysical systems analysis. Origin and evolution of basic magmas in the mantles of the terrestrial planets.

##### Sedimentary Geology

Sedimentology and stratigraphy of modern and ancient clastic and carbonate systems from outcrop, marine sampling, and subsurface data; sequence stratigraphy; diagenesis.

##### Tectonics

Tectonics and structural geology, transpression in the Canadian Cordillera, origin of the Hudson Bay Arc, gravity features of sutures in the Canadian Shield, uplift of the Laurentides, paleomagnetism and plate motions.

##### Volcanology

Physical and chemical approaches to the study of active volcanoes and magmatic-hydrothermal systems; caldera systems, including the chemistry of silicic volcanic rocks, field and experimental studies of collapse mechanisms, and comparisons of recent and ancient caldera systems; magmatic volatiles and volcanic gas studies; arc volcanism, including eruption monitoring; and subaqueous volcanism, including experimental studies of subaqueous pyroclastic flows, and fragmentation of magma.

### 23.3 Admission Requirements

Applicants should have an academic background equivalent to that of a McGill graduate in the Honours or Major program in geology, geophysics, chemistry, or physics (3.0 out of 4.0). The admissions committee may modify the requirements in keeping with the field of graduate study proposed. In some cases a qualifying year may be required.

### 23.4 Application Procedures

Applications and all supporting documents should be received in the Department before February 1st for admission the following September. Applicants who want to be considered for entrance awards, or requiring financial assistance, should apply as early as

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](http://www.mcgill.ca/applying/graduate).

### 23.5 Program Requirements

#### M.Sc. Degree (45 credits)

The M.Sc. degree program includes:

- 12 credits from formal graduate courses to be chosen with the approval of the research director and Director of Graduate Studies and
- 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:

- an approved program of courses selected in consultation with the student's academic adviser, and approved by the Academic Standing Committee,
- a Comprehensive oral examination at the end of the Ph.D.II, and
- 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](http://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.

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

- Denotes courses not offered in 2003-04.

**EPSC 501 CRYSTAL CHEMISTRY.** (3) (Winter) (2 hours lectures, 1 hour seminar) Discussion of crystal structures and compositions of important mineral groups, especially oxides, sulphides and silicates. Solid solution. Relation of structure to morphology and to chemical and physical properties of the rock-forming minerals.

**EPSC 510 GEODYNAMICS AND GEOMAGNETISM.** (3) (Fall) (3 lecture) (Prerequisites: EPSC 320, MATH 319 or permission of the instructor. Corequisite: EPSC 350) The gravity field of the Earth and planets, body and orbital dynamics the Earth, moon and planets, tidal interactions of the Earth-moon-sun system, deformation of the Earth under static and dynamic loads, the magnetic field of the Earth and planets: the magnetosphere, the external radiation belts, magnetohydrodynamic models of the core dynamo, geochemical convection in the core, fluid dynamic motions of the outer core, dynamics of the inner core.

● **EPSC 519 ISOTOPE GEOLOGY.** (3) (Fall) (3 lectures) (Prerequisites: U2 core program)

**EPSC 525 SUBSURFACE MAPPING.** (3) (Winter) (Prerequisites: EPSC 455 or permission of instructor) This course will provide

participants the opportunity to learn how different types of data (wireline logs, seismic, etc.) are employed to map geological features in the subsurface. Lectures will teach participants about the physical basis of each of the data types, and the basic mapping and analytical techniques (e.g., geostatistics, gridding) that are employed in subsurface mapping. The principal focus will be on applying these techniques and concepts to real-world data sets.

● **EPSC 530 VOLCANOLOGY.** (3) (Fall) (2 hours lecture, 3 hours laboratory) (Prerequisites: EPSC 212 and EPSC 312, or permission of instructor)

● **EPSC 542 CHEMICAL OCEANOGRAPHY.** (3) (Fall)

● **EPSC 547 HIGH-TEMPERATURE GEOCHEMISTRY.** (3) (Fall) (2 hours lectures, 3 hours laboratory)

**EPSC 548 PROCESSES OF IGNEOUS PETROLOGY.** (3) (Fall) (2 hours lecture, 1 hour seminar) (Prerequisite: EPSC 423) Investigation of the primary mechanisms causing the diversity of igneous rock compositions on the Earth, other planets, asteroids, and meteorite parent bodies.

● **EPSC 549 HYDROGEOLOGY.** (3) (Winter) (3 hours lecture, 1-2 hours laboratory) (Prerequisite: permission of the instructor)

**EPSC 550 SELECTED TOPICS 1.** (3) (Fall or Winter) (2 hours seminar, permission of department undergraduate advisor) Research seminar and/or lecture with readings in topics concerning aspects of current interests in Earth & Planetary Sciences.

**EPSC 551 SELECTED TOPICS 2.** (3) (Fall or Winter) (2 hours seminar, permission of department undergraduate advisor) Research seminar and/or lecture with readings in topics concerning aspects of current interest in Earth & Planetary Sciences.

**EPSC 552 SELECTED TOPICS 3.** (3) (Fall or Winter) (2 hours seminar, permission of department undergraduate advisor) Research seminar and/or lecture with readings in topics concerning aspects of current interest in Earth & Planetary Sciences.

**EPSC 561 ORE-FORMING PROCESSES 1.** (3) (Fall) (Prerequisite: One course in ore petrology (EPSC 451 or EPSC 452) or permission of the instructor) Physicochemical controls of hydrothermal mineral deposition. Discussion of fluid inclusion theory and application; stable isotope systematics, wall-rock alteration; ore mineral solubility and speciation; and mechanisms of mineral deposition.

**EPSC 562 ORE-FORMING PROCESSES 2.** (3) (Winter) (Prerequisite: One course in mineral deposits (EPSC 451 or EPSC 452) or permission of the instructor) Genesis of hydrothermal mineral deposits. Discussion of geological setting, fluid and metal sources, method of metal transport, and factors controlling metal concentration for a selection of hydrothermal mineral deposit types.

**EPSC 570 COSMOCHEMISTRY.** (3) (Fall) (3 hours lecture) (Prerequisites: EPSC 220, EPSC 210 or permission of instructor) Examines the implications of phase equilibria and the compositions of meteorites and the solar system for the formation and internal differentiation of the terrestrial planets and the nature of chemical fractionation processes in both planetary interiors and the solar system as a whole.

● **EPSC 580 AQUEOUS GEOCHEMISTRY.** (3) (Winter) (3 hours lecture) (Prerequisites: EPSC 210, EPSC 212 or permission of instructor)

**EPSC 590 APPLIED GEOCHEMISTRY SEMINAR.** (3) (Winter) (3 hours seminar) (Prerequisite: permission of instructor) Seminar course devoted to field case studies that illustrate the applications of geochemical principles to solving geologic problems. Each student will prepare and lead a class devoted to a geochemical subject of their own choosing.

**EPSC 601 FELSIC IGNEOUS PETROLOGY.** (3) (Prerequisite: EPSC 423 or equivalent) A review of the mineralogy and phase equilibria relevant to felsic igneous systems. Role of crust and mantle source-areas. Importance of postmagmatic phenomena. Petrogenetic schemes in the current literature.

**EPSC 603 MAFIC IGNEOUS ROCKS.** (3) (Prerequisite: EPSC 423 or equivalent) A survey of the petrochemistry of basic magmatic

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) (3 hours lectures, 3 hours lab) Application of analytical instrumental techniques to obtaining reliable chemical data from complex (geological and environmental) materials, and evaluation of the data in problem solving. Electron Microprobe Analysis (WDS and EDS), Scanning Electron Microscopy, X-ray Fluorescence Spectrometry, X-ray Diffraction, Atomic Spectroscopy (Atomic Absorption, ICP and ICP-MS). Neutron Activation Analysis.

**EPSC 725 INDEPENDENT STUDIES 1.** (3) (Not available to students who have taken EPSC 720. Ineligible for credit in M.Sc. Thesis program) Research and/or reading project. Independent study under the guidance of qualified staff in areas of special interest to the student.

**EPSC 726 INDEPENDENT STUDIES 2.** (3) (Not available to students who have taken EPSC 720. Ineligible for credit in M.Sc. Thesis program) Research and/or reading project. Independent study under the guidance of qualified staff in areas of special interest to the student.

## 24 East Asian Studies

Department of East Asian Studies  
3434 McTavish Street, Room 203  
Montreal, QC H3A 1X9  
Canada

Telephone: (514) 398-6742

Fax: (514) 398-1882

E-mail: [asian.studies@mcgill.ca](mailto:asian.studies@mcgill.ca)

Web site: [www.arts.mcgill.ca/programs/eas](http://www.arts.mcgill.ca/programs/eas)

*Chair* — T. Lamarre

*Director of Graduate Program* — T. Looser

### 24.1 Staff

#### *Professors*

K. Dean; B.A.(Brown), M.A., Ph.D.(Stan.)

R.D.S. Yates; B.A., M.A.(Oxon), M.A.(Calif.), Ph.D.(Harv.)

#### *Associate Professors*

G. Fong; B.A., M.A.(Tor.), Ph.D.(Br. Col.)

T. Lamarre; B.A.(Georgetown), M.A., Ph.D.(Chic.),  
D.Sc.(Aix-Marseille II)

#### *Assistant Professors*

P. Button; B.A.(Col.), M.A., Ph.D.(C'nell)

F. Dal Lago; B.A.(U. of Venice), M.A.(NYU)

T. Looser; B.A.(UC Santa Cruz), M.A., Ph.D.(Chic.)

A. McKnight; B.A.(Wellesley), M.A., Ph.D.(UC Berkeley)

#### *Faculty Lecturers*

J. Chang; B.A.(Taiwan), M.A.(Harv.)

S. Hasegawa; M.A.(Montr.)

M. Kim; B.A., M.A.(Montr.)

M. Uesaka; B.Sc.(Kyoto), M.A.(McG.)

B. Wang; B.A.(Heilongjiang), M.A.(Calg.)

### 24.2 Programs Offered

M.A. in East Asian Studies (*Ad Hoc*).

Ph.D. in East Asian Studies (*Ad Hoc*).

### 24.3 Admission Requirements

#### **General**

TOEFL and GRE (if applicable).

Applicants who have an undergraduate degree from outside Canada will need to take the Graduate Record Examination. A minimum TOEFL score of 577 on the paper-based test (or 233 on the computer-based test) is required for all applicants whose native language is not English.

#### **M.A.**

Applicants must hold, or expect to hold by September of the year of entry, a bachelor's degree for entry into the M.A. program. Applicants should have a Bachelor of Arts degree with a specialization in East Asia; applicants without this specialization who possess a strong disciplinary background are also invited to apply. Those who have experience with an Asian language, but no formal course work, will be required to take a placement test on admission. Those without knowledge of an Asian language will be required to take three qualifying terms (Fall, Winter, Summer) in which they will complete the second year of language; a minimum of a B+ average must be maintained.

#### **Ph.D.**

Applicants must hold, or expect to hold by September of the year of entry, a master's degree in East Asian Studies for entry into the Ph.D. program.

## 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](http://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](http://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 TOPICS IN JAPANESE STUDIES 2.** (3) (Winter) (Departmental approval required) Consideration of selected topics and aspects of Japanese culture and society.

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

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

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

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

● **EAST 530 FOURTH LEVEL CHINESE.** (6) (Summer) Development of skills required to conduct academic discussions in oral as well as in written forms. Teaching materials include original texts from Chinese newspapers, Chinese literature and videos.

**EAST 530D1 FOURTH LEVEL CHINESE.** (3) Development of skills required to conduct academic discussions in oral as well as in written forms. Teaching materials include original texts from Chinese newspapers, Chinese literature and videos.

**EAST 530D2 FOURTH LEVEL CHINESE.** (3)

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

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

**EAST 537D1 CHINA TODAY THROUGH TRANSLATION.** (3) (Not open to students who have taken EAST 437) A course to develop practical translation skills and understanding of contemporary China, focusing on Sino-Canadian and multi-lateral political, cultural and trade issues. Interpretive skills will be enhanced through translation exercises and discussion in class. Course materials

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

**EAST 537D2 CHINA TODAY THROUGH TRANSLATION.** (3)

**EAST 540D1 FOURTH LEVEL JAPANESE.** (3) Advanced study of Japanese, with emphasis on reading Japanese newspapers. Classes will be conducted entirely in Japanese.

**EAST 540D2 FOURTH LEVEL JAPANESE.** (3)

● **EAST 543 CLASSICAL JAPANESE 1.** (3)

● **EAST 544 CLASSICAL JAPANESE 2.** (3)

**EAST 547 ADVANCED READING AND TRANSLATION IN JAPANESE.** (3) This course is designed to improve students' skills in reading and translating Japanese. Readings will be taken from various novels, short stories and articles. Translation from Japanese to English or French.

● **EAST 550 CLASSICAL CHINESE POETRY THEMES AND GENRES.** (3)

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

● **EAST 563 IMAGES, IDEOGRAMS, AESTHETICS.** (3)

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

**EAST 569 ADVANCED TOPICS: JAPANESE LITERATURE.** (3) (Prerequisite: one advanced course in EAS or permission of instructor) (Departmental approval required) Consideration of selected topics and aspects of Japanese literature. The content of the course may vary from year to year from contemporary to modern to pre-modern literature.

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

● **EAST 590 MULTIPLE NARRATIVES OF "ORIENT".** (3)

**EAST 600 EAST ASIAN STUDIES 1.** (3)

**EAST 601 EAST ASIAN STUDIES 2.** (3)

**EAST 619 TOPICS IN LITERARY THEORY.** (3)

**EAST 651 SEMINAR IN TAOIST STUDIES 1.** (3)

**EAST 652 SEMINAR IN TAOIST STUDIES 2.** (3)

**EAST 653 CHINESE POPULAR CULTURE 1.** (3)

**EAST 654 CHINESE POPULAR CULTURE 2.** (3)

**EAST 655 PREMODERN CHINESE POETRY.** (3)

**EAST 656 PREMODERN CHINESE NARRATIVE.** (3)

**EAST 657 WOMEN'S WRITINGS IN TRADITIONAL CHINA.** (3)

**EAST 660 SEMINAR: JAPANESE FICTION.** (3)

**EAST 662 POPULAR CULTURE IN JAPAN.** (3)

**EAST 663 JAPANESE CULTURE AND THOUGHT.** (3)

**EAST 680 SEMINAR: SOCIAL CHANGE IN JAPAN.** (3)

**EAST 690 THESIS RESEARCH 1.** (3)

**EAST 691 THESIS RESEARCH 2.** (3)

**EAST 692 THESIS RESEARCH 3.** (3)

**EAST 693 THESIS RESEARCH 4.** (3)

**EAST 694 THESIS RESEARCH 5.** (3)

**EAST 695 THESIS RESEARCH 6.** (3)

● **EAST 696 THESIS RESEARCH 7.** (6)

**EAST 696D1 THESIS RESEARCH 7.** (3)

**EAST 696D2 THESIS RESEARCH 7.** (3)

**EAST 700D1 EAST ASIAN STUDIES 3.** (3)

**EAST 700D2 EAST ASIAN STUDIES 3.** (3)

**EAST 701D1 EAST ASIAN STUDIES 4.** (3)

**EAST 701D2 EAST ASIAN STUDIES 4.** (3)

**EAST 750 CHINESE LITERARY THEORY AND CRITICISM.** (3)

#### COURSES IN OTHER DEPARTMENTS:

##### Department of Anthropology

ANTH 654 Anthropology of China. (3)

##### Department of Art History and Communication Studies

ARTH 619 Art History - 1400-1900 2. (3)

##### Department of History

HIST 611D1 Seminar: Traditional Chinese History. (3)

HIST 611D2 Seminar: Traditional Chinese History. (3)

HIST 618 Readings in East Asian History. (3)

HIST 668D1 Japanese Intellectual History. (3)

HIST 668D2 Japanese Intellectual History. (3)

##### Department of Political Science

POLI 649 Mass Approach Political Development: China. (3)

##### Faculty of Management

BUSA 625 Asia/Pacific Management. (3)

ORGB 685 Cross Cultural Management. (3)

##### Faculty of Religious Studies

RELG 546 Indian Philosophy. (3)

RELG 548 Indian Buddhist Philosophy. (3)

RELG 549 East Asian Buddhist Philosophy. (3)

RELG 556 Issues in Buddhist Studies. (3)

RELG 557 Asian Ethical Systems. (3)

RELG 655 Buddhist Epistemology. (3)

RELG 658 Japanese Buddhist Philosophy. (3)

RELG 687 Research in Comparative Religion 1. (3)

## 25 Economics

Department of Economics  
Stephen Leacock Building, Room 443  
855 Sherbrooke Street West  
Montreal, QC H3A 2T7  
Canada

Telephone: (514) 398-4845

Fax: (514) 398-4938

E-mail: [graduate.economics@mcgill.ca](mailto:graduate.economics@mcgill.ca)

Web site: [www.mcgill.ca/economics](http://www.mcgill.ca/economics)

Chair — Christopher Green

### 25.1 Staff

#### *Emeritus Professors*

Irving Brecher; B.A.(McG.), M.S., Ph.D.(Harv.)

Kari Polanyi-Levitt; B.Sc.(Lond.), M.A.(Tor.)

#### *Professors*

Robert D. Cairns; B.Sc.(Tor.), Ph.D.(M.I.T.)

Russell Davidson; B.Sc., Ph.D.(Glasgow), Ph.D.(U.B.C.)(*Canada Research Chair*)

Antal Deutsch; B.Com.(Sir G. Wms.), Ph.D.(McG.)

John Galbraith; B.A.(Queen's), M.Phil., D.Phil.(Oxon)

(*James McGill Professor*)

Christopher Green; M.A.(Conn.), Ph.D.(Wis.)

Joseph Greenberg; B.A., M.A., Ph.D.(Heb. U. of Jer.) (*on leave 2003-04*)

Jagdish Handa; B.Sc.(Lond.), Ph.D.(Johns H.)

Ngo van Long; B.Ec.(LaT.), Ph.D.(A.N.U.) (*James McGill Professor*)

Robin Thomas Naylor; B.A.(Tor.), M.Sc.(Lond.), Ph.D.(Cantab.) (*on leave 2003-04*)

J.C. Robin Rowley; B.Sc., M.Sc., Ph.D.(Lond.)

Victoria Zinde-Walsh; M.A.(Wat.), M.Sc., Ph.D.(Moscow St.)

#### *Associate Professors*

Myron Frankman; B.Mgt.E.(Renss.), Ph.D.(Texas)

George Grantham; B.A.(Antioch), M.A., Ph.D.(Yale)  
 Franque Grimard; B.A.(York), Ph.D.(Prin.)  
 John Iton; B.A.(McG.), Ph.D.(Johns H.)  
 C. John Kurien; B.A.(Kerala), M.A., Ph.D.(Vanderbilt) (*on leave 2003-04*)  
 Mary MacKinnon; B.A.(Queen's), M.Phil., D.Phil.(Oxon)  
 Christopher T.S. Ragan; B.A.(Vic. B.C.), M.A.(Queen's), Ph.D.(M.I.T.)  
 Lee Soderstrom; B.A., Ph.D.(Calif.)  
 Thomas Velk; M.S., Ph.D.(Wis.) (*on leave 2003-04*)  
 Alexander Vicas; B.Com.(McG.), M.A., Ph.D.(Prin.)  
 William Watson; B.A.(McG.), Ph.D.(Yale)

#### Assistant Professors

Jim Engle-Warnick; B.S.(Akron), M.B.A.(Carnegie-Mellon), Ph.D.(Pitt.)  
 Hassan Benchenkroun; Diplôme d'ingénieur d'état(École Mohamedia des ingénieurs, Morocco), Ph.D.(Laval)  
 Sonia Laszlo; B.A.(Ott.), M.A.(W.Ont.), Ph.D.(Tor.)  
 Daniel Parent; B.A., M.A.(Laval), Ph.D.(Montr.) (*William Dawson Scholar*)  
 Nurlan Turdaliev; B.Sc.(Moscow), M.A.(Ark.), Ph.D.(Minn.)  
 Licun Xue; B.Eng., M.Eng.(Tianjin), M.A., Ph.D.(McG.)

## 25.2 Programs Offered

M.A. in Economics, thesis and non-thesis options.  
 Ph.D.

Because this Calendar is prepared early in the year, changes may take place after it has been printed. Students are advised to contact the Department Office for supplementary information which may be important to their choice of program.

## 25.3 Admission Requirements

An Honours B.A. in Economics is the normal requirement, although students holding an ordinary B.A., whether in economics or another discipline, may also be eligible for admission. Students judged by the admissions committee to have deficiencies in their preparation in economics may be admitted to a qualifying year in which they undertake advanced undergraduate work.

Students who have not previously passed a suitable course in statistics must take the undergraduate honours statistics course, ECON 257D1/ECON 257D2. A course in the history of economic thought is also a prerequisite for a graduate degree in economics, and students who have not taken such a course will be required to take ECON 460 and ECON 461 or ECON 660 (the M.A. course in History of Economic Thought). Students are also expected to have completed or to complete three terms of introductory calculus and at least one term of linear algebra.

## 25.4 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. original TOEFL and/or GRE results, if applicable.

Information and application form can be downloaded from the Economics Department Web site at [www.mcgill.ca/economics](http://www.mcgill.ca/economics).

Deadline: February 1st for financial consideration.

## 25.5 Program Requirements

Lectures and examinations in the graduate program (M.A. and Ph.D.) in Economics are given in Macroeconomics, Microeconomics and several fields: Econometrics; Economic Development; Economic History; Industrial Organization; International Economics; Labour Economics; Monetary Economics; Public Finance; Mathematical Economics; Advanced Theory. Courses at

the 600 level are usually taught in the first-term. Seminars/courses at the 700 level are offered in many of the fields listed above. They are generally given in the second term and normally have as a prerequisite the corresponding 600-level course.

### Requirements for the M.A. Degree (48 credits)

#### I. M.A. with Thesis:

The requirements for the Master's degree are:

1. Successful completion of the following courses with a grade in each of at least B- (65%);  
 ECON 610 (3 credits) Microeconomic Theory 1  
 ECON 620 (3 credits) Macroeconomic Theory 1  
 Twelve complementary credits which must include either  
 ECON 665 Quantitative Methods (3 credits) or  
 ECON 662D1/ECON 662D2 Econometrics (6 credits)  
 A minimum of 6 credits must be taken in the same field.
2. Completion of a Master's thesis, the subject of which must be approved by a thesis committee.

The total thesis program requirement is 48 credits (18 credits of course work and 30 credits for the thesis). An average grade of B (70%) in approved courses is needed for graduation.

Econometrics ECON 662D1/ECON 662D2 or equivalent is strongly recommended but will not meet the 6-credit field requirement for the M.A.

#### II. M.A. with Research Paper:

1. Successful completion of the following courses with a grade in each of at least B- (65%):  
 Six required credits:  
 ECON 610 (3 credits) Microeconomic Theory 1  
 ECON 620 (3 credits) Macroeconomic Theory 1  
 Eighteen complementary credits which must include either  
 ECON 665 Quantitative Methods (3 credits) or  
 ECON 662D1/ECON 662D2 Econometrics (6 credits)  
 A minimum of 6 credits must be taken in the same field.
2. A research paper of about 50 pages in length.  
 The total non-thesis program requirement is 48 credits (24 credits for course work and 24 credits for the research report). An average grade of B (70%) in approved courses is needed for graduation.

Econometrics ECON 662D1/ECON 662D or equivalent is strongly recommended but will not meet the six credit field requirement for the M.A.

Residency requirement for the M.A. degree: Three full-time terms for the M.A. degree one of which can be an approved Summer Term. Many students are able to complete the M.A. requirements in one calendar year.

#### III. M.A. Degree Program Non-thesis Option in Social Statistics:

The program complements disciplinary training with research experience applying statistical methods to Statistics Canada data (or equivalent). Students will normally complete normal program course requirements, supplemented by further statistical courses, as advised by the Option advisor, and subject to approval by the home department. Students will complete a statistics-based M.A. research paper (Economics, Political Science, Sociology) or thesis (Geography) in conjunction with an interdisciplinary capstone seminar.

Acceptance into the program is by application to the Social Statistics Option Committee and is contingent on acceptance into the M.A. program in one of the participating departments (Economics, Geography, Political Science, Sociology), which in turn requires meeting the Graduate and Postdoctoral Studies Office admission requirements.

**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.
4. Three years of residence (credit for one year may be granted for master's work at McGill or for graduate study at another university).

**Ph.D. Comprehensive Examination.** This examination consists of written examinations in Macroeconomics, Microeconomics and two fields. A third field is also required, although this requirement is satisfied by successful completion of two courses in that field.

**Doctoral Dissertations.** Doctoral dissertations make original contributions to the literature. The topic must be approved by a two-person supervisory committee whose Chair is the student's Director of Research. The completed thesis must be approved by an external examiner as well as by two internal examiners before the student may defend the work at a formal oral examination.

**25.6 Courses for Higher Degrees**

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.**

**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.

**ECON 525 PROJECT ANALYSIS.** (3) (Open to advanced undergraduate students. Prerequisite: ECON 250, ECON 352 or equivalent) A course in cost benefit analysis for graduate and advanced undergraduate students.

**ECON 534 PENSION CRISIS.** (3) The consequences of commitments made by governments in the area of old age pensions and the implications of the resulting tax burden. An international perspective will be adopted.

**ECON 546 GAME THEORY.** (3) (Prerequisite: ECON 230 or ECON 250) (Not open to students who have taken ECON 446. Open to advanced undergraduate students) This course introduces students to game theory, the branch of the social sciences that focuses on the formal modelling and analysis of human interactions and strategic behaviour. Basic concepts in cooperative and non-cooperative games are applied to economic models.

- **ECON 567 COMPLEX AND INTERACTIVE SYSTEMS.** (3)

**ECON 577 MATHEMATICAL ECONOMICS 1.** (3) (Prerequisites: MATH 133, MATH 139 and MATH 141 or equivalent) A mathematical treatment of basic economic theory.

- **ECON 578 MATHEMATICAL ECONOMICS 2.** (3) (Prerequisite: ECON 577)

**ECON 602 ECONOMIC HISTORY.** (3) Selected topics in European and North American economic history are investigated from the standpoint of the interplay of institutional change and quantitative growth.

- **ECON 604 MACROECONOMICS FOR POLICY 1.** (3)
- **ECON 605 MICROECONOMICS FOR POLICY 1.** (3)
- **ECON 606 MACROECONOMICS FOR POLICY 2.** (3)
- **ECON 607 MICROECONOMICS FOR POLICY 2.** (3)

**ECON 610 MICROECONOMIC THEORY 1.** (3) This is the first in a two-course sequence in microeconomics. The core microeconomics sequence (ECON 610, ECON 611) provides a rigorous coverage of the economic foundation upon which economic fields are built. Most of the sequence is devoted to building up this foundation of consumer and firm optimisation (including choice under uncertainty), partial and general equilibrium, and welfare economics. The remainder of 154-611 covers special topics that vary from year to year. These are likely to be drawn from the following: social choice; externalities and public goods; models of asymmetric information; the principal-agent framework; search; basic game theory.

**ECON 611 MICROECONOMIC THEORY 2.** (3) This is the second in a two-course sequence in microeconomics.

**ECON 620 MACROECONOMIC THEORY 1.** (3) This course is the first in a two-course sequence in macroeconomics. The course offers a thorough treatment of the fundamentals of macroeconomic theory. Emphasis is placed on the construction of economic models with microeconomic foundations. Topics include market-clearing and non-market-clearing models, capital accumulation, business cycles, monetary policy and fiscal policy.

**ECON 621 MACROECONOMIC THEORY 2.** (3) This is the second in a two-course sequence in macroeconomics. The course provides an in-depth analysis of selected issues in macroeconomic theory, extending and complementing the coverage provided in ECON 620.

- **ECON 622 PUBLIC FINANCE.** (3)

**ECON 623 MONEY AND BANKING.** (3) A rigorous analysis of the demand and supply of money and the role that it plays in the economy. Study of the ideas of the major schools of thought in monetary economics.

**ECON 624 INTERNATIONAL ECONOMICS.** (3) A detailed examination of theories and policies in international trade and finance.

**ECON 634 ECONOMIC DEVELOPMENT.** (3) A systematic treatment of the characteristics and problems of economic development in underdeveloped countries.

**ECON 637 INDUSTRIAL ORGANIZATION AND REGULATION.** (3) An analysis of the nature of the firm, industrial structure and the effect of structure on firm and industry behaviour and performance.

**ECON 641 LABOUR ECONOMICS.** (3) A synthesis of theoretical developments in the area of labour economics with stress upon problems of empirical testing.

**ECON 650 RESEARCH 1.** (3) Preparation for work on M.A. thesis and M.A. research report.

**ECON 651 RESEARCH 2.** (3) Preparation for work on M.A. thesis and M.A. research report.

**ECON 652 RESEARCH 3.** (3) Preparation for work on M.A. thesis and M.A. research report.

**ECON 653 RESEARCH 4.** (3) Preparation for work on M.A. thesis and M.A. research report.

- **ECON 662 ECONOMETRICS.** (6)

**ECON 662D1 ECONOMETRICS.** (3) (Students must also register for ECON 662D2) (No credit will be given for this course unless both ECON 662D1 and ECON 662D2 are successfully completed in consecutive terms) (ECON 662D1 and ECON 662D2 together are equivalent to ECON 662) A broad treatment of econometric methods, with particular reference to time series processes. Estimation of linear and non-linear models, GLS, IV, Maximum Likelihood, parametric specification testing for linear and non-linear hypotheses, diagnostic testing (autocorrelation, heteroskedasticity, normality, parameter constancy, etc.), modelling technique, non-stationary data processes.

**ECON 662D2 ECONOMETRICS.** (3) (Prerequisite: ECON 662D1) (No credit will be given for this course unless both ECON 662D1 and ECON 662D2 are successfully completed in consecutive terms) (ECON 662D1 and ECON 662D2 together are equivalent to ECON 662)

**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 all Ph.D. students who have not taken Econometrics as a field.

**ECON 670 THESIS 1.** (6)

**ECON 671 THESIS 2.** (6)

**ECON 672 THESIS 3.** (6)

**ECON 680 M.A. REPORT 1.** (3) The M.A. Report must demonstrate the candidate's ability to do independent work at the graduate level in a particular field of economics. While length will vary with the subject matter, it is expected that on average reports will be about 50 pages long. The Report will be graded jointly by two members of the Department. The supervisor will normally be one of the examiners.

**ECON 681 M.A. REPORT 2.** (3) The M.A. Report must demonstrate the candidate's ability to do independent work at the graduate level in a particular field of economics. While length will vary with the subject matter, it is expected that on average reports will be about 50 pages long. The Report will be graded jointly by two members of the Department. The supervisor will normally be one of the examiners.

**ECON 682 M.A. REPORT 3.** (3) The M.A. Report must demonstrate the candidate's ability to do independent work at the graduate level in a particular field of economics. While length will vary with the subject matter, it is expected that on average reports will be about 50 pages long. The Report will be graded jointly by two members of the Department. The supervisor will normally be one of the examiners.

**ECON 683 M.A. REPORT 4.** (3) The M.A. Report must demonstrate the candidate's ability to do independent work at the graduate level in a particular field of economics. While length will vary with the subject matter, it is expected that on average reports will be about 50 pages long. The Report will be graded jointly by two members of the Department. The supervisor will normally be one of the examiners.

**ECON 705 READING COURSE: SELECTED TOPICS ECONOMICS.** (3) Reading course in Economics.

**ECON 706 SELECTED TOPICS.** (3) (Prerequisites: ECON 610, ECON 620 and 6 additional credits at the 600 level) Reading course in Economics.

**ECON 720 ADVANCED GAME THEORY.** (3) The main focus of the course will be the "theory of social situations" (which is closely related to "game theory") which is a new and integrative approach to the study of formal models (both cooperative and non-cooperative) in the social sciences.

**ECON 721 ADVANCED MONETARY THEORY.** (3) Selected topics in monetary theory, the theory of monetary policy, and the history of monetary institutions.

**ECON 724 INTERNATIONAL ECONOMICS.** (3) Selected problems in international trade, foreign exchange and international movements of capital.

● **ECON 734 ECONOMIC DEVELOPMENT.** (3) Problems of economic growth and planning in selected underdeveloped countries. Topics covered vary from year to year in response to student interests; growth, poverty and income distribution, LDC labour markets and institutions, trade and development, international debt problems, issues in trade policy.

**ECON 737 INDUSTRIAL ORGANIZATION AND REGULATION SEMINAR.** (3) Builds on material covered in ECON 637. Problems are examined in greater depth with specific topics varying from year to year.

● **ECON 741 ADVANCED LABOUR ECONOMICS.** (3) Selected theoretical and policy issues in labour economics.

**ECON 742 EMPIRICAL MICROECONOMICS.** (3) (Prerequisite: First term of ECON 662 and either ECON 634 or ECON 641, or consent of the instructor) Surveys the empirical techniques used in

applied microeconomic fields, particularly development and labour economics. Focus is on the formulation of empirical models derived from economic theory, and on various estimation methodologies, including panel data econometrics, limited dependent variable models, and duration analysis. A "hands on" approach is emphasized.

**ECON 744 HEALTH ECONOMICS.** (3) The emphasis will be on describing and analyzing the structure and performance of the Canadian health system, though some attention will be given to recent attempts by the federal and provincial governments to deal with current problems in this field. Readings will be selected from the economics and health literature.

● **ECON 750 SELECTED TOPICS: MICROECONOMICS.** (3)

● **ECON 752 TOPICS IN FINANCIAL ECONOMICS.** (3)

● **ECON 761 ECONOMETRICS: TIME SERIES ANALYSIS.** (3) (Not open to students who have taken ECON 762) (Offered only in some years)

**ECON 762 ECONOMETRICS - ASYMPTOTIC AND FINITE - SAMPLE.** (3) Exact and asymptotic distribution theory in econometrics: basic results for estimation and inference in regression models, extensions and other selected topics including nonparametric and distribution-free methods for econometric models.

**ECON 763 FINANCIAL ECONOMETRICS.** (3) This course covers advanced time series methods used in the analysis of financial data and other potentially non-stationary time series. Topics: integrated time series, co-integration, unit root testing, conditional heteroscedasticity, long memory, non-parametric and neural network models. Applications include market efficiency, stochastic volatility and predictability of asset returns.

● **ECON 799 PH.D. COMPREHENSIVE EXAMINATION.** (0)

**ECON 799D1 PH.D. COMPREHENSIVE EXAMINATION.** (0) (Students must also register for ECON 799D2) (No credit will be given for this course unless both ECON 799D1 and ECON 799D2 are successfully completed in consecutive terms) (ECON 799D1 and ECON 799D2 together are equivalent to ECON 799)

**ECON 799D2 PH.D. COMPREHENSIVE EXAMINATION.** (0) (Prerequisite: ECON 799D1) (No credit will be given for this course unless both ECON 799D1 and ECON 799D2 are successfully completed in consecutive terms) (ECON 799D1 and ECON 799D2 together are equivalent to ECON 799) See ECON 799D1 for course description.

## 26 Educational and Counselling Psychology

Department of Educational and Counselling Psychology  
Education Building, Room 513  
3700 McTavish Street  
Montreal, QC H3A 1Y2

Telephone – Program Information: (514) 398-4241

Fax: (514) 398-6968

Web site: [www.mcgill.ca/edu-ecp](http://www.mcgill.ca/edu-ecp)

Chair — Susanne P. Lajoie

Program Directors:

*Professional Psychology Program Grouping*

*Counselling Psychology* — Theodore J. Maroun

*School/Applied Child Psychology* — Ingrid Sladeczek

*Associate Program Director* — Jacob A. Burack (Applied Developmental Psychology)

*Professional Education Program Grouping*

*Family Life Education* — Theodore J. Maroun

*General Educational Psychology* — F. Gillian Bramwell

*Inclusive and Gifted Education* — Nancy Heath

*Cognition and Instruction Program Grouping* —

Alenoush Saroyan

*Associate Program Director* — Lynn McAlpine (Adult Education)

**26.1 Staff***Emeritus Professors*

Eigil Pedersen; B.A.(Sir G. Wms.), M.A.(McG.), Ed.D.(Harv.)  
Howard A. Stutt; B.A.(Queen's), B.Ed., M.Ed.(Montr.), F.C.C.T.

*Professors*

Mark W. Aulls; B.S.(Ball St.), M.Ed.(Ind.), Ed.D.(Georgia)  
Jacob A. Burack; B.A.(Col.), M.S., M.Phil., Ph.D.(Yale)  
Glenn F. Cartwright; B.A.(Sir G. Wms.), M.A.(McG.), Ph.D.(Alta.),  
F.A.A.S.P., F.C.C.T.  
Jeffrey L. Derevensky; B.A.(C. W. Post), M.A., Ph.D.(McG.)  
Janet G. Donald; B.A., M.A.(W. Ont.), Ph.D.(Tor.) (*joint appoint.*  
*with the Centre for University Teaching and Learning*)  
Florent R. Dumont; A.B.(Col.), M.S.(S. Conn. St.), Ed.D.(Mass.)  
Carl H. Frederiksen; B.A.(Harv.), M.A., Ph.D.(Ill.)  
Susanne P. Lajoie; B.A., M.A.(McG.), Ph.D.(Stan.)  
Bruce M. Shore; B.Sc., M.A.(McG.), Ph.D.(Calg.)

*Associate Professors*

Joyce F. Benenson; B.Sc.(Duke), Ph.D.(Harv.)  
Antonio Bernardelli; B.Sc.(Loy. Coll. Montr.), M.Ed., Ed.D. (McG.)  
(PT)  
Robert J. Bracewell; B.Sc., M.A.(McM.), Ph.D.(Tor.)  
F. Gillian Bramwell; B.A., M.A.(Sask.), Ph.D.(C'dia)  
Alain Breuleux; B.Sc., M.Sc., Ph.D.(Montr.)  
Jack de Stefano; B.A.(Loy. Coll. Montr.), M.A., Ed.D.(McG.) (PT)  
Kim Cornish; B.Sc.(Lancaster), Ph.D.(Lond.)  
Janet Donin; B.A.(Tor.), M.A.(Ill.), Ph.D.(Cal.) (*joint appoint. with*  
*Integrated Studies in Education*)  
James P. Hanrahan; B.A., B.Ed.(St. F. X.), M.A.(McG.),  
Ph.D.(Lond.)  
Nancy L. Heath; B.A.(McG.), M.Ed.(Ott.), Ph.D.(Tor.)  
Michael L. Hoover; B.S.(Tulane), M.A., M.Phil., Ph.D.(Col.)  
Robert A. Lavers; B.A.(Bishop's), M.Sc., Ph.D.(McG.)  
Evelyn Lusthaus; B.S., M.S., Ph.D.(S.U.N.Y. Buffalo)  
Theodore J. Maroun; B.S.(S.U.N.Y. Potsdam), M.S.(Canisius),  
M.Ed.(S.U.N.Y. Buffalo), Ed.D.(Ind.)  
Lynn M<sup>c</sup>Alpine; B.A.(McG.), M.A.(C'dia), Ph.D.(Tor.) (*joint appoint.*  
*with the Centre for University Teaching and Learning*)  
Alenoush Saroyan; B.A.(Pahlavi), M.Ed.(Loy. U. Chic.),  
Ph.D.(McG.) (*joint appoint. with the Centre for University*  
*Teaching and Learning*)  
Ada L. Sinacore; B.A.(Montclair St.), M.A., M.Ed., Ph.D.(Col.)  
Ingrid E. Sladeczek; B.A., M.S., Ph.D.(Ariz.), A.A.(Maryland)  
Renée Stevens; B.A.(U.C.L.A.), M.A., Ph.D.(McG.) (PT)  
Barbara Wainrib; B.A.(Brooklyn Coll.), M.Sc.(McG.), D.Ed.(Mass.)  
(PT)  
Cynthia B. Weston; B.A. (Georgetown), M.L.S.(S.U.N.Y.),  
D.Ed.(Wash.) (*joint appoint. with the Centre for University*  
*Teaching and Learning*)

*Assistant Professors*

Miranda D'Amico; B.A., M.A.(C'dia), Ph.D.(McG.) (PT)  
Marlene Dworkind; B.A., M.Ed.(McG.) (PT)  
Marilyn Fitzpatrick; B.A.(Tor.), M.Ed., Ph.D.(McG.)  
Robert Savage; B.A.(Oxford), M.Sc.(Cambridge), M.Sc.,  
Ph.D.(Univ.Lond.)  
Ronald Stringer; B.Sc., M.A., Ph.D.(Tor.)

*Adjunct Professors*

Annie Alaku; B.Ed.(McG.) (*Kativik School Board*)  
H. Don Allen; B.Sc.(McG.), M.S.T.M.(Santa Clara), Ed.M.,  
Ed.D.(Rutgers)  
Susan Butler; B.A., M.A.(McG.), Ph.D.(Lond.)  
Franco Carnevale; B.Sc.N, MSCA, M.Ed., M.Sc., Ph.D.(McG.)  
Bertha Dawang; B.A.(Sir G. Wms.), M.Ed.(McG.)  
Valentina De Krom; B.A.(Ott.), M.Sc.(McG.) (*Nunavut Arctic*  
*College*)  
Marcia A. B. Delcourt; M.A.B., B.Sc.(Bloomsburg), M.A.,  
Ph.D.(Conn.) (*Western Connecticut University*)  
Michael J. Dixon; B.A., B.Sc.(Trent), M.A., Ph.D.(C'dia) (*Douglas*  
*Hospital*)  
Peter J. Doehring; B.A.(McG.), M.A., Ph.D. (C'dia) (*Douglas*  
*Hospital*)

Mary Eljassiapik, B.Ed.(McG.) (*Kativik School Board*)  
Micki Lane; A.B.(U.C. Berkeley), M.A., Ph.D.(U.C.L.A.) (*MVM*  
*Communications*)

Elsa Lo; B.A.(Queen's), B.A.(Dalhousie), M.A., Ph.D.(McG.)  
Henry Markovits; B.Sc.(McG.), M.Sc.(Sussex), Ph.D.(Montr.)  
Judith A. MacArthur; B.A.(Sir G. Wms.), M.Ed.(McG.) (*Kativik*  
*School Board*)  
Leonard Shenker; B.Sc.(C.C.N.Y.), Ph.D.(McG.)  
Michael Thomas; B.A.(Univ.Coll. Wales), M.A.(Montr.)

*Associate Members*

Terry Gandell, Mary H. Maguire, Joseph Rochford,  
Lalit K. Srivastava, Claire-Dominique Walker, Laura Winer,  
Vicki Zack

*Part-time Instructors*

Diane Bateman, Andrew Chiarella, Lucy Cumyn, Dawn Cruchet,  
Cindy Finn, Susan Hayut, Andrew Hum, Denise Maroun,  
Judy McBride, Sharon Miller, Judith Norton, Margaret O'Byrne,  
Rosemary Reilly, Andre Renaud, Kieron Rogan, Joan Stafford,  
Gerry Weintraub

**26.2 Programs Offered**

The Department offers M.A. (Non-thesis), M.A. (Thesis), and Ph.D. programs in Counselling Psychology and in Educational Psychology, as well as an M.Ed. in Educational Psychology.

Also offered is a Graduate Diploma in School/Applied Child Psychology (Ph.D. Respecialization); [see section 26.5.3 "Professional Psychology Program Grouping – M.A. \(Non-thesis\), M.A., Ph.D."](#)

At the undergraduate and continuing professional education levels, the Department offers the Certificate in Inclusive Education, Certificate in Educational Technology, a Graduate Certificate in Counselling Applied to Teaching, Certificate in First Nations and Inuit Student Personnel Services, Diploma in Family Life Education, and a B.A. Minor Concentration in Educational Psychology.

For information about graduate programs, please contact the appropriate Program Coordinator (Secretary):

**Cognition and Instruction and Professional Education**, including Adult Education, Applied Cognitive Science, Computer Applications in Education, Education of the Gifted, Family Life Education, General Educational Psychology, Higher Education, Inclusive (formerly "Special") Education, Instructional Psychology, Psychology of Gender — Mrs. Geri Norton, (514) 398-4244.

**Professional Psychology**, including Counselling Psychology, School/Applied Child Psychology, and Applied Developmental Psychology — Ms. Diane Bernier, (514) 398-4245.

Graduate programs are organized under two degree designations, Counselling Psychology and Educational Psychology. Within Educational Psychology, degrees are offered in three program groupings, each covering different specializations. Please refer to the detailed subsections following for each to verify which degrees are available and specific requirements.

Educational Psychology Ph.D. programs are organized around a Major and Minor; students may freely select the combination of Major and Minor across program groupings, according to availability. Some of the specializations listed below are available only as Minors, and School/Applied Child Psychology is available only as a Major.

**Cognition and Instruction**

- Adult Education  
(admission to this specialization has been suspended)
- Applied Cognitive Science
- Computer Applications in Education  
(admission to this specialization has been suspended)
- Higher Education
- Instructional Psychology

**Professional Education**

- Education of the Gifted
- Family Life Education
- General Educational Psychology
- Inclusive Education
- Psychology of Gender

**Professional Psychology**

- Applied Developmental Psychology
- Counselling Psychology
- School/Applied Child Psychology

**Professional Accreditation**

The Major in School/Applied Child Psychology of the Ph.D. in Educational Psychology is accredited by the American Psychological Association (APA).

The Ph.D. in Counselling Psychology is jointly accredited by the Canadian Psychological Association and the American Psychological Association.

The Ordre des psychologues du Québec (OPQ) has endorsed accreditation of both the Ph.D. in Counselling Psychology and the Ph.D. in Educational Psychology Major in School/Applied Child Psychology as this calendar went to press. Both applications have been forwarded to the Office des professions du Québec. Once accredited, graduates of these two programs who are also graduates of recognized undergraduate programs in Psychology (a list is available from the OPQ or the Department) will qualify for automatic admission to the professional practice of Psychology in Quebec. They presently receive “fast track” consideration under the admission procedures for the evaluation of “equivalence”. Ph.D. graduates with any other undergraduate preparation, and all graduates until the accreditation process is complete, are eligible to apply for OPQ membership by review of equivalence of their training.

The M.A. (Non-thesis) in Counselling Psychology is accredited by the Ordre professionnel des conseillers et conseillères d'orientation du Québec (OPCCOQ). Graduates of this program meet the professional requirements for licensing as a Counsellor in Quebec. This program does not qualify graduates to meet the requirements for certification as a Psychologist.

The M.Ed. Educational Psychology Concentration in Family Life Education is approved by the Association of Family Life Educators of Quebec (AFLEQ). AFLEQ has established reciprocal recognition of qualifications with the Canadian Association of Family Life Educators.

Graduate degrees in Educational or Counselling Psychology, and elsewhere in Education, do not lead to teaching certification – see the Undergraduate Education Calendar for B.Ed. programs. Holders of other undergraduate degrees may apply to enter the B.Ed. with advanced standing.

**Research Facilities**

The Department maintains working relationships with specialized centers and research groups offering opportunities for training and research to selected students. This includes the Centre for University Teaching and Learning, concerned with educational improvement and evaluation in higher education; the Centre for Medical Education whose activities focus on training in the health sciences; the Psychoeducational and Counselling Clinic which assists children, adolescents, and adults with learning and other problems; the Neuropsychology Department of Rivière des Prairies Hospital; the Taylor Adolescent Program conducted in association with the Learning Associates of Montreal; the Laboratory of Applied Cognitive Science which conducts research on human learning and performance; the Apple Research Partnership Program (APR) which assists in developing Macintosh software; the Computer-Based Instructional Research Laboratory; the Office for Student Disabilities (McGill University Student Services); and the High Ability and Inquiry Research Group concerned with giftedness, creativity, and the role of inquiry in teaching and learning. Students considering participation in the activities of any Centre or research group should contact the researchers responsible, their own program director or advisor about eligibility, types of available involvement, and any registration requirements.

**Professional Conduct**

Several programs (Counselling Psychology, School/Applied Child Psychology, Inclusive Education, and others) have professional components and field placements. In all aspects of any program, on campus and off, students are expected to conduct themselves in accord with the professional standards of all relevant professional associations, in accord with the law (e.g., Youth Protection), and the expectations of organizations receiving field placements. This applies to all aspects of professional conduct, including but not limited to respect for persons, property, and confidentiality, appropriate dress, and punctuality. Failure to meet these expectations, regardless of performance in courses or other formal program requirements, will be taken into account in the assessment of the students' overall academic standing in the program and, in the most serious instance, may result in a requirement to withdraw from the program.

**26.3 Admission Requirements**

Specific admission requirements vary across degrees and program options. Please see additional details with each detailed description below.

**26.4 Application Procedure**

McGill's on-line application form is available to all graduate program candidates at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

All applicants must supply:

1. A completed application form.
2. Official transcripts of post-secondary studies.
3. Letters of reference.
4. Application fee (\$60 Canadian – credit card, cheque or money order, payable in Canadian \$ to “McGill University”).
5. TOEFL score (where applicable).

Additional specific requirements apply to particular degrees and program options. Please see additional details with each detailed description below.

Applications including the fee should be addressed to the Program Coordinator (Secretary) at the above address, clearly stating the Degree (M.Ed., M.A. with or without thesis, Ph.D., or Post-Ph.D. Graduate Diploma) and specialization of interest.

The deadline for applications is February 1 for Summer and September admission. Some programs will consider other admission dates — please consult the Program Coordinator (Secretary) beforehand if applying after February 1. Late applications in some programs may be considered if places have not been filled. The September starting date is normally firm in accredited professional programs.

**26.5 Program Requirements****26.5.1 Graduate Degrees in Counselling Psychology – M.A.(Non-thesis), M.A., Ph.D.**

(see also [section 26.5.2 “Graduate Degrees in Educational Psychology – M.Ed., M.A. \(Non-thesis\), M.A., Ph.D.”](#))

**M.A.(NON-THESIS) COUNSELLING PSYCHOLOGY**

The aim of the M.A.(Non-thesis) in Counselling Psychology is to produce graduates who (a) are trained in the major academic and applied areas of Counselling Psychology; (b) will be qualified to be counsellors in a variety of settings that require educational, vocational, personal, and developmental counselling; (c) have a knowledge of counselling in both the academic and applied aspects, and (d) who have an extensive supervised internship in either a clinical or educational setting. This program also qualifies graduates to apply to the Ph.D. program in Counselling Psychology and membership in the OPCCOQ.

**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)**

EDPC 606	(3)	Theories of Counselling 1
EDPC 607	(3)	Theories of Counselling 2
EDPC 608	(3)	Group Counselling: Theory
EDPC 609	(3)	Psychological Testing 1
EDPC 615	(3)	Assessment and Diagnosis in Counselling
EDPC 618	(3)	Professional Ethics and the Law
EDPC 624	(3)	Group Counselling: Practice
EDPC 662	(3)	Career Psychology
EDPC 665D1	(3)	Practicum
EDPC 665D2	(3)	Practicum

**Internship – Required (24 credits)**

Four 6-credit components reflect various dimensions of the profession. Completion of the internship is essential to becoming a member of the OPCCOQ.

EDPC 679	(6)	Internship: General 1
EDPC 680D1	(3)	Internship Research Seminar
EDPC 680D2	(3)	Internship Research Seminar
EDPC 682D1	(3)	Practicum: Psychological Test
EDPC 682D2	(3)	Practicum: Psychological Test
EDPC 685	(6)	Internship: Vocational and Rehabilitation Counselling

**Elective Courses (6 credits)**

The following courses may be offered periodically and taken to complete or exceed the academic requirements. Electives may also be chosen from other courses offered by the Department or other departments of the University. Choice of electives requires approval of the student's faculty advisor.

EDPC 616	(3)	Individual Reading Course
EDPC 630	(3)	Feminism, Women and Psychology
EDPC 635	(3)	Counselling for Sexual Adjustment
EDPC 636	(3)	Theories of Sex Therapy
EDPC 660	(3)	Selected Topics in Counselling

EDPC 670	(3)	Current Trends in Counselling
EDPE 617	(3)	Adolescent Development

**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)**

EDPC 606	(3)	Theories of Counselling 1
EDPC 607	(3)	Theories of Counselling 2
EDPC 608	(3)	Group Counselling: Theory
EDPC 609	(3)	Psychological Testing 1
EDPC 662	(3)	Career Psychology
EDPC 665D1	(3)	Practicum
EDPC 665D2	(3)	Practicum

**Thesis Component – Required (24 credits)**

EDPC 697	(6)	Thesis Preparation 1
EDPC 698	(6)	Thesis Preparation 2
EDPC 699D1	(6)	Thesis Preparation 3
EDPC 699D2	(6)	Thesis Preparation 3

**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 implications for the practice of counselling psychology.
3. To develop professionals who are able to integrate a broad theoretical and practical knowledge base into the practice and supervision of counselling psychology, that is, to train professionals capable of addressing complex issues and applying that understanding to practice and supervision.

- 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 and college mental health centers, and professional positions in psychological agencies offering preventative mental health services.

#### Admission Requirements

- All Ph.D. applicants must have secured in writing a research supervision commitment from one of the counselling psychology staff members prior to candidacy.
- Each applicant, in addition to having a Master's degree in counselling psychology or its equivalent, must present evidence of research capability such as a Master's thesis, an Honours thesis or, at the minimum, a well-developed proposal for a doctoral thesis.
- All applicants who have not completed a Master's level internship will have their applications evaluated on a case-by-case basis.
- Each applicant is required to take the Graduate Record Examination (General and Psychology Tests).
- Three (3) letters of reference.

#### Ph.D. in Counselling Psychology

Applicants are advised that in accordance with the Canadian Psychological Association and American Psychological Association criteria for doctoral program accreditation, all doctoral candidates must have a solid grounding in the history of psychology, developmental psychology, abnormal psychology, and the social aspects and determinants of behavior. If applicants to this program do not have such courses in their undergraduate or Master's level education, they will be required to take supplemental courses in these domains after entering the doctoral program.

#### Required Courses, Comprehensive Examination, and Internship (84 credits)

##### Required Courses (54 credits)

EDEM 692	(3)	Qualitative Research Methods
EDPC 709	(3)	Advanced Theories and Models
EDPC 714	(3)	Theory / Models: Family Therapy
EDPC 719	(3)	Advanced Small Group Counselling
EDPC 720D1	(3)	Seminar Vocational Psychology and Career Development Theory
EDPC 720D2	(3)	Seminar Vocational Psychology and Career Development Theory
EDPC 780	(6)	Professional Development
EDPC 782	(6)	Doctoral Field Experience
EDPC 786	(6)	Seminar: Research Problems in Counselling
EDPE 622	(3)	Multiculturalism and Gender
EDPE 627	(3)	Professional Practice of Psychology
EDPE 676	(3)	Intermediate Statistics 2
EDPE 682	(3)	Univariate/Multivariate Analysis
EDPE 684	(3)	Applied Multivariate Statistics
EDPE 712	(3)	Neurological Bases of Behavior
EDPC 701		Comprehensive Examination

##### Complementary Courses (6 credits)

EDPE 616	(3)	Cognitive Development (or an equivalent course)
EDPE 617	(3)	Adolescent Development
or EDPE 623	(3)	Social-Emotional Development

##### Internship – Required (24 credits)

EDPC 795	(24)	Supervised Fieldwork: Counselling
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##### Other Requirements

Most applicants to the Ph.D. program enter with previous supervised fieldwork and with considerable educational and clinical counselling experience. Candidates must coordinate with their academic supervisors an appropriate setting for their fieldwork

(pre-doctoral practicum and internship) before entering the formal studies of the program. All students attend weekly case conferences.

A minimum of two years full-time study is required following the Master's degree; three or four are commonly required.

#### 26.5.2 Graduate Degrees in Educational Psychology – M.Ed., M.A. (Non-thesis), M.A., Ph.D.

(see also [section 26.5.1 "Graduate Degrees in Counselling Psychology – M.A.\(Non-thesis\), M.A., Ph.D."](#))

##### M.Ed. EDUCATIONAL PSYCHOLOGY

The aim of the M.Ed. is to offer educators advanced professional training in areas where educational psychology can make a practical contribution to teaching, such as (a) the application of the results of educational research, (b) evaluation of student learning, teaching, programs, and educational experimentation and innovation, (c) a greater understanding of human development, individual differences, and the learning process, and (d) a greater understanding of classroom processes and strategies for teaching diverse learners. Courses will be offered at times that enable part-time study. The program is directed toward the innovative teacher at any level. Applicants may choose the general program or one of several concentrations.

The program offers six M.Ed. areas of concentration of studies:

- Adult Education  
(admission to this concentration has been suspended),
- Computer Applications  
(admission to this concentration has been suspended),
- Education of the Gifted,
- Family Life Education,
- General Educational Psychology,
- Inclusive Education.

Students may design their studies around the Major/Minor areas outlined under the Ph.D. listings. This is especially recommended for students contemplating an application to the Ph.D. (Educational Psychology) following the M.Ed.

##### Admission Requirements

- An undergraduate degree in education, psychology, or another field relevant to the proposed studies in Educational Psychology.
- CGPA of 3.0 out of 4.0 or higher in undergraduate studies.
- Statements of academic and research experience, relevant professional training and experience.
- Letters of reference from at least two professional colleagues, or from at least two former university instructors, and any others the applicant wishes should be submitted.

##### Program Requirements

The program contains three main parts: (a) 3 required courses (9 credits), (b) two required courses (12 credits) constituting a Special Activity, the student's major project intended to demonstrate by performance that the student has succeeded in the program – the Special Activity may be one large project or two smaller ones, and (c) optional courses, totalling 27 credits that allow the student to design an individualized program or specialize in one or more areas of concentration.

Some courses are offered in alternating years. Students should take EDPE 602 early in their program. Pre- or corequisite to EDPE 602: EDPE 575 Educational Measurement or its equivalent; this course may be included as an elective within the 48 credits of the M.Ed. and should be taken first. The program director or advisor for the M.Ed. area of concentration should be consulted about the specific sequence to be followed

##### Required Courses (21 credits)

EDPE 602	(3)	Uses of Research Findings in Education
EDPE 603	(3)	Educational Research and Development for Practitioners
EDPE 635*	(3)	Theories of Learning and Instruction
EDPE 697	(6)	Special Activity 1

**EDPE 698\*\* (6) Special Activity 2**

\* Inclusive Education and Family Life Education students may replace EDPE 635 with EDPE 636 or take both

\*\* Inclusive Education students may replace EDPE 698 with EDPI 656

**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 Life Education Concentration as described is essential for recognition by the accrediting body.

**(a) Adult Education**

(Admission to this concentration has been suspended)

The M.Ed. Concentration 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.

- EDPA 610 (3) Foundations of Adult Education  
EDPA 612 (3) The Adult Learner  
EDPA 614 (3) Teaching the Adult

**(b) Computer Applications in Education**

(Admission to this concentration has been suspended)

15 credits from among the following:

- EDPE 640 (3) Research in Computer Applications  
EDPE 641 (6) Use of the Computer in Educational Instruction  
EDPE 643 (3) Evaluation - Computer Software and Hardware  
EDPE 650 (3) Consciousness and Virtual Reality  
EDPE 660 (3) Artificial Intelligence and Education

**(c) Education of the Gifted**

- EDPI 526 (3) Talented and Gifted Students  
EDPI 536 (3) Practicum Gifted Education 1

plus 3 credits from the following:

- EDPI 527 (3) Creativity and its Cultivation  
EDPI 537 (3) Practicum Gifted Education 2  
EDPI 628 (3) Gifted Students: Special Needs

**(d) Family Life Education**

- EDPC 502 (3) Group Processes and Individuals  
EDPC 507 (3) Practicum: Group Leadership Skills  
EDPC 640 (3) The Foundation of Family Life Education

plus 9 credits from the following:

- EDPC 501 (3) Helping Relationships  
EDPC 503 (3) Human Sexuality: Professionals  
EDPC 504 (3) Practicum: Interviewing Skills  
EDPC 505 (3) Crisis Intervention Processes  
EDPC 508 (3) Seminar in Special Topics  
EDPC 509 (3) Individual Reading Course  
EDPC 510 (3) Family Life Education and Marriage  
EDPE 560 (3) Human Development  
EDPE 564 (3) Family Communication  
EDPE 565 (3) Psychosocial Aspects of Cancer  
EDPE 595 (3) Seminar in Special Topics

**(e) General Educational Psychology**

The program is designed individually by the student in consultation with the student's faculty advisor or Associate Program Director.

**(f) Inclusive Education**

The following pattern is recommended for students without previous background in inclusive education. With the advice of the student's faculty advisor, the program will be adapted to address students' academic and professional interests and needs.

- EDPI 642 (3) Educational of Learners/Special Needs 1  
EDPI 643 (3) Education of Learners/Special Needs 2  
EDPI 645 (3) Diagnosis and Assessment in Special Education  
EDPI 654 (3) Instruction/Curriculum Adaption  
EDPI 665 (3) Research and Theory in Learning Disabilities  
EDPI 667 (3) Behavioral and Emotional Problems  
EDPI 680 (3) Selected Topics in Special Education 1  
EDPI 526 (3) Talented and Gifted Students

Since 1997 the Quebec Ministry of Education no longer issues specialist certificates except in initial teacher education. Specialized certificates are not required to seek employment, but school boards will still seek suitably qualified applicants for teaching and consulting positions.

**PRE-DOCTORAL STUDIES**

M.Ed. students and graduates are eligible to apply to the Ph.D. in Educational Psychology if they have completed the following program elements. These may have been included within the M.Ed. program. Upon completion of the M.Ed., if the uncompleted requirements can be accomplished in one year of study or less, they may be taken in the Ph.D. 1 year. Any excess must be completed before Ph.D. studies can begin. The required elements are:

- studies within a Major area to be pursued within the Ph.D. (there is no required number of courses since Major sequences are calculated across Master's and Ph.D. studies),
- the following general courses: (a) EDPE 602, (b) EDPE 603 (research methods) or EDEM 692, EDSE 630 or the equivalent (qualitative research methods), and (c) EDPE 676 (intermediate statistics).
- a research project in the manner of an M.A. thesis (though less extensive) within at least one of the Special Activities (EDPE 697 or EDPE 698).

In the Ph.D. 1 year for M.Ed. (Educational Psychology) graduates, students will normally complete any remaining Ph.D. required courses listed below, continue study in their Major and Minor sequences, and actively begin their doctoral research. The courses referred to are:

- EDPE 600 (3) Current Topics: Educational Psychology  
EDPE 682 (3) Univariate/Multivariate Analysis  
and, optionally,  
EDPE 684 (3) Applied Multivariate Statistics

All three courses may be taken as options within the M.Ed.

M.Ed. students who contemplate continuing to a Ph.D. (Educational Psychology) Major in the Cognition and Instruction Program Grouping should take EDPE 666 and, in addition, take EDPE 555 which may supplement or replace EDPE 600.

**M.A. EDUCATIONAL PSYCHOLOGY (48 credits – or 78 credits for School/Applied Child Psychology)**

The aim of the M.A. (with thesis) is to produce graduates who (a) are broadly trained in educational psychology, (b) have sufficient research competence to critically evaluate research in educational psychology, and to design, conduct and report empirical research, and (c) have experience in applying research methods and findings to the solution of practical problems in varied educational settings.

Admission and Program Requirements vary among program areas that correspond to Ph.D. Majors described in "[Major Sequences in the Ph.D.\(Educational Psychology\)](#)" on page 165.

**Admission Requirements**

1. An undergraduate degree in education, psychology, or another field relevant to the proposed studies in Educational

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)

EDPE 605 (3) Research Methods  
EDPE 676 (3) Intermediate Statistics 2  
EDPE 682 (3) Univariate/Multivariate Analysis

#### Thesis Component – Required (24 credits)

EDPE 604 (3) Thesis 1  
EDPE 607 (3) Thesis 2  
EDPE 693 (3) Thesis 3  
EDPE 694 (3) Thesis 4  
EDPE 695 (6) Thesis 5  
EDPE 696 (6) Thesis 6

#### Complementary Courses (15 credits)

one of:

EDPE 600 (3) Current Topics: Educational Psychology  
or EDPE 555 (3) Applied Cognitive Science

and 12 credits to be chosen by students with the approval of their supervisors and the program director. The courses must come from at least two different Major or Minor Ph.D. sequences or other courses in those areas. Courses may be applied toward Ph.D. (Educational Psychology) Major and Minor requirements.

It is generally recommended that students make their choices from among the courses required for the Ph.D. Major or Minor sequences or the M.Ed. Concentration in their areas of primary interest. These are enumerated below.

Students intending to proceed to the Ph.D. Majors in Applied Cognitive Science or Instructional Psychology take courses for which EDPE 555 Applied Cognitive Science or the equivalent is a prerequisite. Students may take both EDPE 555 and EDPE 600 among their complementary courses.

### 26.5.3 Professional Psychology Program Grouping – M.A. (Non-thesis), M.A., Ph.D.

#### M.A. (NON-THESIS) EDUCATIONAL PSYCHOLOGY

The M.A. (Non-thesis) in Educational Psychology is available only to students admitted to the study sequence leading to the Ph.D. in Educational Psychology (Major in School/Applied Child Psychology). The M.A. is normally awarded after completion of the first two years of the five-year Ph.D., including the School Psychology Research Project.

#### Admission Requirements

1. Major or Honours B.A. or B.Sc. in Psychology or a B.Ps. including courses in developmental, abnormal, and cognitive psychology, history and systems of psychology, statistics; and results of the Graduate Record Examination (Verbal, Quantitative, and Psychology).
2. GREs should be taken no later than December.
3. A three-page research proposal is required of students applying for entrance with advanced standing.

#### Program Requirements

Detailed program requirements for the full five-year program are listed below under the Ph.D. Major in School/Applied Child Psychology.

#### M.A. EDUCATIONAL PSYCHOLOGY

The M.A. in Educational Psychology with thesis in this program grouping is available in two specializations, Applied Developmental Psychology (48 credits) and School/Applied Child Psychology (78 credits). In the latter case, students must begin in the M.A. (Non-thesis) and may request to transfer at the end of the first semester or thereafter.

#### Admission Requirements

Same as for the M.A. (Non-thesis) specialization in School/Applied Child Psychology.

#### 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 (12 credits)

*Applied Developmental Psychology and School/Applied Child Psychology:*

EDPE 600 (3) Current Topics: Educational Psychology  
EDPE 605 (3) Research Methods  
EDPE 676 (3) Intermediate Statistics 2  
EDPE 682 (3) Univariate/Multivariate Analysis

#### Thesis Component – Required (24 credits)

*Applied Developmental Psychology:*

EDPE 604 (3) Thesis 1  
EDPE 607 (3) Thesis 2  
EDPE 693 (3) Thesis 3  
EDPE 694 (3) Thesis 4  
EDPE 695 (6) Thesis 5  
EDPE 696 (6) Thesis 6

Students in School/Applied Child Psychology who may wish to do an M.A. (with thesis) should consult the Program Director regarding additional requirements.

#### Complementary Courses (12 credits)

To be chosen by students with the approval of their supervisors and the Program Director. The courses must come from at least two different Major and Minor sequences or other courses in those areas. Courses may be applied toward Ph.D. (Educational Psychology) Major and Minor requirements.

For students in School/Applied Child Psychology there are no complementary courses. All courses taken at the M.A. level are prescribed within the M.A./Ph.D. sequence described below and the total at the M.A. level, including thesis, is 78 credits.

#### Ph.D. EDUCATIONAL PSYCHOLOGY

Areas including Major sequences:

Applied Cognitive Science  
Applied Developmental Psychology  
Instructional Psychology  
School/Applied Child Psychology  
Special Populations of Learners  
(Special Needs Option)  
(Gifted Education Option)

The aim of the Ph.D. is to produce graduates who are competent in planning and implementing basic and applied research on problems of cognition; teaching and learning, and development, applying research methods to the solution of educational problems and the improvement of educational practices. It prepares graduates to work as psychologists, consultants, and program directors in schools or related educational institutions, and for teaching educational psychology at the university level. Opportunities are provided for advanced study, research, clinical practice, practica and internships experience in the application of research.

## Admission Requirements

All doctoral students must have a research advisor upon entry to the program. Interested candidates should contact the program coordinator (secretary) for a faculty list or consult the Department Web page. An advisor may be selected from among professors in the Department. It is essential to clearly state the Major. It is helpful to identify the Minor as well.

Students in School/Applied Child Psychology are automatically considered to elect Applied Developmental Psychology as their Minor, but may also add another Minor in some circumstances.

There are two entry levels and patterns:

- + starting at Ph.D. 2
- starting at Ph.D. 1

The specific requirements to be admitted at each level are as follows:

### Ph.D. 2 level

(a) Applicants should hold an M.A. in Educational Psychology from McGill or a recognized equivalent degree, reflecting high overall standing, study within the area of proposed doctoral specialization, and evidence of research competence.

or

(b) Applicants should have completed the first year in the Department's M.A. program, with high academic standing in coursework, including study within the area of proposed doctoral specialization, and the completion of a research project supervised by a faculty member.

### Ph.D. 1 level

(a) Applicants should hold an M.Ed. in Educational Psychology or a Master's degree in a related discipline (e.g., sociology, social work) lacking only the content in educational psychology that can be acquired within one year of full-time study. The applicant's academic record must reflect high overall standing and evidence of research competence.

or

(b) Applicants should hold a Bachelor's degree in psychology, reflecting high academic standing in an Honours or Major program, and have completed an undergraduate thesis or the equivalent. (This option is rarely exercised.)

All applicants will also be expected to provide:

1. at least two letters of recommendation,
2. a 3-5-page summary proposal of the intended thesis research,
3. a statement of experience, career plans, and program appropriateness, and
4. a copy of a Master's thesis, Honours thesis, or research project (which will be returned after examination).

## Additional Entrance Notes:

### School/Applied Child Psychology

Applicants are required to supply results of the Graduate Record Examinations (Verbal, Quantitative, and Psychology) at the time of initial application. An undergraduate Major or Honours degree in Psychology is required including courses in developmental, abnormal and cognitive psychology, history and systems in psychology, and statistics. McGill Psychology graduates completing the 36-credit B.A. Major Concentration must complete at least 18 additional credits of senior undergraduate study in psychology or related subjects.

Students will enrol for two years in the M.A. (Non-thesis) in Educational Psychology, and will follow the course sequence noted below. At the end of the first semester or thereafter students may request to change to the M.A. with thesis if supervision is available. Students will receive the M.A. following the second year having completed all the requirements and to proceed directly to Ph.D. 2 in their third year of study unless advised after the third M.A. semester that they are not maintaining a sufficiently high standard to continue to the Ph.D. Such students may elect to complete the M.A. or withdraw.

## Applied Developmental Psychology

Applications to the Ph.D. are normally only accepted from the thesis M.A. to Ph.D. route (see the M.A. in Educational Psychology). Other entrance requirements are the same as for School/Applied Child Psychology.

Applicants with exceptional strength in academic studies who do not meet the above requirements may apply for admission to the doctoral program. Such students may be required to complete a qualifying year or term prior to applying for Ph.D. admission.

## Program Requirements

All students are required to elect and follow a Major and a Minor sequence. Students who are making satisfactory progress in their studies may be permitted to fulfil the requirements of a second Minor within the programs. Courses from Major and Minor sequences taken during M.A. and M.Ed. studies are counted toward the total. A Major consists of five courses (15 credits), except in School/Applied Child Psychology, and a Minor consists of three courses (9 credits). Each Major and Minor is specified below and the degree of choice of courses within each is indicated separately.

Candidates admitted into Ph.D. 2 are required to complete a minimum of two full years of study. Candidates admitted into Ph.D. 1 are required to complete a minimum of three full years of study.

A dissertation must be submitted displaying original scholarship expressed in satisfactory literary form and constituting a distinct contribution to knowledge on a problem in educational psychology. Work on the thesis normally begins in the Ph.D. 2 year and becomes the major concern in the Ph.D. 3 year of a student's program of study.

Each student will be supervised by an advisor who will chair the student's doctoral committee. This committee will have a minimum of three members. It will assist the student and advisor in planning the student's program. It will also be consulted in the nomination of external examiners for the thesis.

## Ph.D. Educational Psychology Core Courses

These requirements apply to all Majors and except for EDPE 708 (Comprehensive Examination) they may partly or wholly be completed in the M.A. or M.Ed.

Students may replace any course for which they have equivalent background, subject to approval by the Program Director.

## Required Courses and Comprehensive Examination

EDPE 605	(3)	Research Methods
EDPE 676	(3)	Intermediate Statistics 2
EDPE 682	(3)	Univariate/Multivariate Analysis
EDPE 708		Comprehensive Examination

## Complementary Courses (6 credits)

3 credits chosen from:

EDPE 684	(3)	Applied Multivariate Statistics
EDEM 692	(3)	Qualitative Research Methods
EDSL 630	(3)	Qualitative/Ethnographic Studies
		or the equivalent

plus 3 credits, as follows:

*Students in the Ph.D. Major in Applied Cognitive Sciences choose one of:*

EDPE 600	(3)	Current Topics: Educational Psychology.
EDPE 555	(3)	Applied Cognitive Psychology

*Students in other Ph.D. Majors choose one of:*

EDPH 689	(3)	Teaching and Learning in Higher Education
EDPC 780	(6)	Professional Development

## Language Requirement

Students are not required to demonstrate knowledge of a second language within this program, but anyone wishing to be licensed as a psychologist in Quebec must at that point demonstrate a working knowledge of French. Appropriate courses are available at McGill.

**Major Sequences in the Ph.D.(Educational Psychology)**

The following sequences are in addition to the Ph.D. Educational Psychology Core courses.

**(a) Applied Cognitive Science**

Research on the cognitive processes and knowledge structures that underlie learning, competence and performance in educationally significant domains and populations of learners; applied research employing the theories, methods and findings of the cognitive sciences to the analysis of cognitive processes underlying performance in instructional tasks including: reading comprehension, written composition and other literacy skills; computation, mathematical problem solving and other mathematical skills; learning and the acquisition of knowledge and skill in other content domains of school learning and cognitive processes, including differences between novices and experts, and comparative studies of different populations of learners; applications of cognitive analyses of school learning and performance to the improvement of learning and instruction and the diagnosis and remediation of learning difficulties.

Students in the Applied Cognitive Science Major are required to take a total of 30 credits plus the comprehensive examination (12 credits of core requirements for Educational Psychology, 3 credits for Cognition and Instruction, and 15 credits for the Applied Cognitive Science major).

**Required Courses** (6 credits)

EDPE 656 (3) Applied Cognitive Theory/Methods  
EDPE 666 (3) Cognition and Instruction (to be taken first)

**Complementary Courses** (9 credits)

9 credits to be chosen from:

EDPE 655 (3) Cognitive Science and Education  
EDPE 661 (3) Discourse Processes and Education  
EDPE 662 (3) Psycholinguistics and Learning  
EDPE 663 (3) Learning in Complex Situations  
EDPE 664 (3) Nature/Development of Expertise  
EDPE 665 (3) Reasoning and Problem Solving  
EDPE 668 (3) Advanced Seminar Cognitive

**(b) Applied Developmental Psychology**

Child and adolescent development including cognitive, language, social issues, and personality development, and gender issues in relation to processes of learning, problems and practices of education, child rearing and family influences, and social interaction in varied educational settings; developmental theories, developmental psychopathology and social policy issues.

**Required Courses** (9 credits)

EDPE 615 (3) Theory/Issues: Child Development  
EDPE 616 (3) Cognitive Development  
EDPE 623 (3) Social Emotional Development

**Complementary Courses** (6 credits)

6 credits from the following, which may be offered in rotation:

EDPE 515 (3) Gender Identity Development  
EDPE 610 (3) History of Developmental Psychology  
EDPE 620 (3) Developmental Psychopathology  
EDPE 622 (3) Multiculturalism and Gender  
EDPE 628 (3) Advanced Seminar - Developmental

**(c) Instructional Psychology**

Research on cognitive processes applied to instruction and learning in classrooms and other instructional situations at all levels of education including higher education, adult and professional education; applied research on the design of effective instructional environments including educational applications of computers; application of research methods, models and results in evaluating and improving the capacity of classrooms and other instructional environments to support high levels of educational accomplishment in learners with varied backgrounds of knowledge, ability and experience.

Students in the Instructional Psychology Major are required to take a total of 30 credits plus the comprehensive examination

(12 credits of core requirements for Educational Psychology, 3 credits for Cognition and Instruction, and 15 credits for the Instructional Psychology major).

**Required Courses** (9 credits)

EDPE 666 (3) Cognition and Instruction (to be taken first)  
EDPE 645 (3) Research on Instructional Processes  
EDPE 648 (3) Instructional Psychology Seminar  
(to be taken near the end)

**Complementary Courses** (6 credits)

to be chosen from:

EDPE 535 (3) Instructional Design  
EDPE 635 (3) Theories of Learning and Instruction  
EDPE 670 (3) Educational Evaluation  
EDPE 687 (3) Advanced Qualitative Methods

**(d) School/Applied Child Psychology**

This program is constructed according to the scientist-practitioner model. Child and adolescent problems faced by practicing school and child psychologists. Research on the educational impact of intellectual deficits, emotional disorders, pervasive developmental disorders, abuse, social-effective and cognitive development, high risk indices, and psychological assessment in school and educationally related settings. Development psychopathology and therapeutic interventions and techniques, coordination of psychological and pedagogical services in educational settings. This is a minimum 96-credit, five-year fixed major that includes the M.A.

**Required Courses** (60 credits)

EDPC 609 (3) Psychological Testing 1  
EDPC 610 (3) Psychological Testing 2  
EDPC 618 (3) Professional Ethics and the Law  
EDPC 714 (3) Theory/Models: Family Therapy  
EDPE 611 (3) School Psychology Seminar  
EDPE 616 (3) Cognitive Development  
EDPE 619 (3) Child and Adolescent Therapy  
EDPE 620 (3) Developmental Psychopathology  
EDPE 622 (3) Multiculturalism and Gender  
EDPE 623 (3) Social-Emotional Development  
EDPE 625 (3) Practicum 1: School Psychology  
EDPE 626 (3) Practicum 2: School Psychology  
EDPE 627 (3) Professional Practice of Psychology  
EDPE 629 (6) School Psychology Research Project  
EDPE 682D1 (3) Practicum: Psychological Testing  
EDPE 682D2 (3) Practicum: Psychological Testing  
EDPE 710 (3) Consultation in School Psychology  
EDPE 712 (3) Neurological Bases of Behavior  
EDPI 654 (3) Instruction/Curriculum Adaptation

Students who transfer from the M.A.-level Non-thesis to the Thesis option will replace EDPE 629 (6 credits) with EDPE 604, EDPE 607, and EDPE 693 to EDPE 696 (total 24 credits). Electing the M.A.-level Thesis option will, therefore, add 18 credits to the 60 required in the Non-thesis option, for a total of 78 credits.

**Complementary Courses** (12 credits)

Students must select 2 of these 3 practicum settings:

EDPE 721 (6) School Psychology: Elementary  
EDPE 722 (6) School Psychology: Secondary  
EDPE 723 (6) School Psychology: Community  
Placement in a school covering all grades may be applied to either EDPE 721 or EDPE 722.

**Internship** (24 credits)

EDPE 725 (12) Internship 1 - School Psychology  
EDPE 726 (12) Internship 2 - School Psychology

**(e) Special Populations of Learners**

Focus on research and teaching of special groups of students, including gifted and creative students, and special needs children and adolescents. In the area of special needs students, the focus is on inclusive settings. Theoretical models, intervention strategies, and systems change are explored.

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

EDPI 643 (3) Education of Learners/Special Needs 2  
 EDPI 743 (3) Seminar on Special Needs  
 EDPI 756 (3) Internship/Special Needs Education  
 and 6 credits from the courses offered in the M.Ed. Inclusive Education Concentration with the approval of the student's thesis supervisor and the Program Director.

#### Special Populations of Learners/Gifted Education Option

EDPI 526 (3) Talented and Gifted Students  
 EDPE 535 (3) Instructional Design  
 EDPI 636 (3) Curriculum in Gifted Education  
 EDPE 670 (3) Educational Evaluation  
 or EDPE 671D1 (3) Educational Evaluation: Theory and Practice  
 EDPE 671D2 (3) Educational Evaluation: Theory and Practice

and one of the following, which may be offered in rotation:

EDPI 527 (3) Creativity and its Cultivation  
 EDPI 628 (3) Gifted Students: Special Needs  
 EDPE 636 (3) Classroom Processes - Social

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)

EDPA 610 (3) Foundations of Adult Education  
 EDPA 612 (3) The Adult Learner  
 EDPA 614 (3) Teaching the Adult

##### (b) Applied Cognitive Science

##### Complementary Courses (9 credits)

6 credits chosen from:

EDPE 555 (3) Applied Cognitive Science  
 EDPE 655 (3) Cognitive Science and Education  
 EDPE 656 (3) Applied Cognitive Theory/Methods  
 EDPE 666 (3) Cognition and Instruction

3 credits chosen from:

EDPE 661 (3) Discourse Processes and Education  
 EDPE 662 (3) Psycholinguistics and Learning  
 EDPE 663 (3) Learning in Complex Situations  
 EDPE 664 (3) Nature/Development of Expertise  
 EDPE 665 (3) Reasoning and Problem Solving  
 EDPE 668 (3) Advanced Seminar Cognitive

##### (c) Applied Developmental Psychology

EDPE 615 (3) Theory/Issues: Child Development  
 EDPE 616 (3) Cognitive Development  
 EDPE 623 (3) Social-Emotional Development

##### (d) Computer Applications in Education

(Admission to this concentration has been suspended.)

#### Complementary Courses (9 credits)

9 credits chosen from:

EDPE 640 (3) Research in Computer Applications  
 EDPE 641 (6) Use of the Computer in Educational Instruction  
 EDPE 643 (3) Evaluation - Computer Software and Hardware  
 EDPE 650 (3) Consciousness and Virtual Reality  
 EDPE 660 (3) Artificial Intelligence and Education

#### (e) Family Life Education

EDPC 505 (3) Crisis Intervention Processes  
 EDPC 640 (3) The Foundations of Family Life Education  
 EDPE 564 (3) Family Communication

#### (f) Higher Education

##### Required Courses (9 credits)

EDPH 582 (3) Higher Education Theory/Policy  
 EDPH 588 (3) The Higher Education Environment  
 EDPH 681 (3) Higher Education Development

#### (g) Instructional Psychology

##### Required Courses (6 credits)

EDPE 666 (3) Cognition and Instruction (to be taken first)  
 EDPE 648 (3) Instructional Psychology Seminar  
 (to be taken near the end)

##### Complementary Courses (3 credits)

to be chosen from one of the following:

EDPE 535 (3) Instructional Design  
 EDPE 635 (3) Theories of Learning and Instruction  
 EDPE 645 (3) Research on Instructional Processes

#### (h) Psychology of Gender

EDPE 515 (3) Gender Identity Development (must be completed at the Master's or Ph.D. 1 level).  
 EDPE 624 (3) Educational Psychology and Gender  
 EDPC 630 (3) Feminism, Women and Psychology  
 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

EDPI 643 (3) Education of Learners/Special Needs 2  
 EDPI 743 (3) Seminar on Special Needs

and 3 credits from the courses offered in the M.Ed. Inclusive Education Concentration with the approval of the student's thesis supervisor and the Program Director.

#### (j) Special Populations of Learners/Gifted Education

EDPI 526 (3) Talented and Gifted Students  
 EDPI 536 (3) Practicum Gifted Education 1

and one of:

EDPI 527 (3) Creativity and its Cultivation  
 EDPI 537 (3) Practicum Gifted Education 2  
 EDPI 628 (3) Gifted Students: Special Needs

### 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 Major in School/Applied Child Psychology, which is accredited in the School Psychology category by the American Psychological Association (APA). Graduates of a respecialization program are normally accorded the same recognition as graduates of the accredited program.

The Ph.D. Major has also been approved by the Ordre des psychologues du Québec (OPQ) which has recommended the final stage of professional recognition to the Office des professions of the Government of Quebec. Once this accreditation is confirmed, however, graduates of the Post-Ph.D. Graduate Diploma will *not* be automatically eligible for membership in the OPQ and the right to practice professional psychology in Quebec. If it is their ultimate wish to do so, they will be required to apply to the OPQ for the recognition of equivalent qualifications.

Accreditation status may be confirmed by contacting the accrediting bodies:

**APA** – Committee on Accreditation, 750 First Street NE, Washington, DC, USA 20002-4242  
tel. 1-800-374-2721-option 5-local 5974

**CPA** – 151 Slater Street, Suite 205, Ottawa, ON, Canada K1P 5H3  
tel. 1-888-472-0657

**OPCCOQ** – 1100 Beaumont, Ste. 520, Mt-Royal, QC, Canada H3P 3H5; tel. 514-737-6431

**OPQ** – 1100 Beaumont, Ste. 510, Mt-Royal, QC, Canada H3P 3H5; tel. 514-738-1881

#### Admission Requirements

1. An earned doctorate in Educational Psychology, another area of Psychology, or a closely related discipline (to be recognized at the Program Director's discretion).
2. Graduate Record Examination Verbal, Quantitative, and Psychology results taken within 5 years preceding this application.
3. Full transcripts of the student's complete university (and, if applicable, college) education showing all courses in psychology, education, and related disciplines.
4. At least two letters of recommendation addressing both academic record and potential for professional practice in psychology.
5. A statement of experience, career plans, and program appropriateness.
6. A curriculum vitae including all theses or dissertations, publications, and conference presentations, with copies of the title pages and abstracts of any theses or dissertations appended.
7. TOEFL minimum score of 577 on the paper-based test (233 on the computer-based test) for non-Canadian students from countries where English is not the first language and who have not completed a recognized university degree taught in English.

Students may be asked to provide further details in support of any request for a course exemption, e.g., course outlines, examples of work done in the course, or a letter from the instructor or department where the material is claimed to have been covered.

#### Program Requirements

The program will be individually tailored to each accepted student in respect of previous studies and experience. Students will not be asked to repeat a course on a topic in which they can demonstrate a high level of competence. The following are expected to be most often required of students.

#### Required Courses and Clinic-based Practica (30 credits)

EDPC 609	(3)	Psychological Testing 1
EDPC 610	(3)	Psychological Testing 2
EDPC 618	(3)	Professional Ethics and the Law
EDPC 682D1	(3)	Practicum: Psychological Testing
EDPC 682D2	(3)	Practicum: Psychological Testing
EDPE 619	(3)	Child and Adolescent Therapy
EDPE 625	(3)	Practicum 1: School Psychology
EDPE 626	(3)	Practicum 2: School Psychology
EDPE 710	(3)	Consultation in School Psychology
EDPE 714	(3)	Models of Family Therapy

#### Complementary Courses – Field Placements (12 credits)

(2 days per week, one semester each; students select 2 of these 3 field experiences; placement in a school covering all grades may be applied to either EDPE 721 or EDPE 722):

EDPE 721 (6) School Psychology: Elementary

EDPE 722 (6) School Psychology: Secondary

EDPE 723 (6) School Psychology: Community

#### Internship (24 credits)

(1 year full-time or 2 years half-time)

EDPE 725 (12) Internship 1 - School Psychology

EDPE 726 (12) Internship 2 - School Psychology

Please see the description of the Ph.D. Educational Psychology Major in School Applied Child Psychology for the full list of requirements from which each student's Graduate Diploma program will be constructed.

#### Language Requirement

Students are not required to demonstrate knowledge of a second language within this program, but any student wishing to be licensed as a professional psychologist in Quebec must at that point have a working knowledge of French.

## 26.6 Courses

**Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.**

#### Single term and Multi-term Courses (D1/D2, N1/N2, J1/J2/J3)

The same course may be available as a single term offering and also as a multi-term offering. The course content and credit weight is equivalent in all modes; the only difference being the scheduling.

**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:** Some courses are open only to students in specific programs or concentrations. For specific program applicability consult the program profiles above. Some courses, particularly in psychological assessment, have supplementary lab fees. Details are available from the Program Coordinator (Secretary).

Some courses are offered in alternate years and others only when numbers warrant. Annual lists are available. Please consult the Department before attempting to register.

Descriptions of courses not scheduled in 2003-04 can usually be found in the preceding Calendar.

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

#### 26.6.1 EDPA – Ed Psych & Couns (Adult Education)

##### Courses:

EDPA 610 Foundations of Adult Education. (3)

EDPA 612 The Adult Learner. (3)

EDPA 614 Teaching the Adult. (3)

#### 26.6.2 EDPC – Ed Psych & Couns (Counselling)

##### Courses currently scheduled for 2003-04:

**EDPC 501 HELPING RELATIONSHIPS.** (3) (Open to Educational and Counselling Psychology students.) A course in the basic principles of human relationships and communication skills, approached from a theoretical and experimental viewpoint. An emphasis will be given to training in basic listening skills, interviewing techniques, and the interpretation of non-verbal behaviour and communication.

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

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

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

**EDPC 505 CRISIS INTERVENTION PROCESSES.** (3) Instruction in the skills of working with crisis situations involving persons emotionally disturbed, suicidal, or alcoholic, and those who are on drugs or experiencing emotional trauma, as well as other problems. 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 family and the societal content will be explored within the existing and emerging theories of vocational, developmental, and transitional psychology.

**EDPC 665D1 PRACTICUM.** (3) Practice in counselling interactions in preparation for internship. Developing expertise and confidence in a full range of skills to help clients make and implement self-directed choices. Emphasis on the counsellor as an educational and therapeutic agent dealing with vocational, educational, and personal counselling using various intervention modes.

**EDPC 665D2 PRACTICUM.** (3)

**EDPC 679D1 INTERNSHIP: GENERAL 1.** (3)

**EDPC 679D2 INTERNSHIP: GENERAL 1.** (3)

**EDPC 680D1 INTERNSHIP RESEARCH SEMINAR.** (3) Students become acquainted with current research designs in both quantitative and qualitative traditions and develop skills in both analyzing research projects and critiquing journal articles. Special emphasis is given to the application of research findings to field settings and clinical process. Lecture, discussion, workshops, and student research presentations are used.

**EDPC 680D2 INTERNSHIP RESEARCH SEMINAR.** (3)

**EDPC 682D1 PRACTICUM: PSYCHOLOGICAL TESTING.** (3) (Prerequisite: EDPC 609. Open only to students in Counselling Psychology or School/Applied Child Psychology) Seminar and field practice in the administration and interpretation of educational and psychological tests including personality, within clinical and educational settings. Selection and evaluation of test instruments will be covered. Supervision of report writing and the ethical use of test information.

**EDPC 682D2 PRACTICUM: PSYCHOLOGICAL TESTING.** (3)

**EDPC 685D1 INTERNSHIP: VOCATIONAL AND REHABILITATION COUNSELLING.** (3) Study, observation, and practice of specialized aspects of counselling through Faculty supervision and direction by personnel in the internship setting.

**EDPC 685D2 INTERNSHIP: VOCATIONAL AND REHABILITATION COUNSELLING.** (3)

**EDPC 709 ADVANCED THEORIES AND MODELS.** (3) (Prerequisite: EDPC 624) Further study of theories and models in counselling, their history, development, and applications.

**EDPC 714 THEORY / MODELS: FAMILY THERAPY.** (3) For doctoral students in Counselling and School Psychology. Theoretical and therapeutic models in family therapy, core concepts and their relevance for application, intervention strategies, the child in family context, impact on school performance.

**EDPC 780D1 PROFESSIONAL DEVELOPMENT.** (3) Individually planned and developed (1) supervision of Master's practicum or internship students, (2) co-teaching with a McGill staff member,

and (3) diversified research experiences utilizing different techniques and instrumentation.

**EDPC 780D2 PROFESSIONAL DEVELOPMENT.** (3)

**EDPC 782D1 DOCTORAL FIELD EXPERIENCE.** (3) (Corequisite: EDPC 780D1) A 2-day/week, 2-term (minimum 500 hours) doctoral practicum integrating research, theory, and supervised practica to provide a perspective for clinical work within the field of counselling psychology. Skill development in counselling intervention, assessment, treatment plans, etc. Clientele will be individuals, families, and groups with a variety of concerns.

**EDPC 782D2 DOCTORAL FIELD EXPERIENCE.** (3) (Corequisite: EDPC 780D2)

**EDPC 795D1 SUPERVISED FIELDWORK: COUNSELLING.** (12)

A 5-day, 10 to 11-month supervised internship (minimum 1200 hours). Study, observation, assessment and diagnosis, and practice in Counselling Psychology settings. Group seminar and individual conferences. May be accumulated over two years.

**EDPC 795D2 SUPERVISED FIELDWORK: COUNSELLING.** (12)

**Other courses:**

EDPC 508 Seminar in Special Topics. (3)  
 EDPC 509 Individual Reading Course. (3)  
 EDPC 540 Family Life Education. (3)  
 EDPC 608 Group Counselling: Theory. (3)  
 EDPC 616 Individual Reading Course. (3)  
 EDPC 616D1 Individual Reading Course. (1.5)  
 EDPC 616D2 Individual Reading Course. (1.5)  
 EDPC 624 Group Counselling: Practice. (3)  
 EDPC 630 Feminism, Women and Psychology. (3)  
 EDPC 660 Selected Topics in Counselling. (3)  
 EDPC 670 Current Trends in Counselling. (3)  
 EDPC 670D1 Current Trends in Counselling. (1.5)  
 EDPC 670D2 Current Trends in Counselling. (1.5)  
 EDPC 679 Internship: General 1. (6)  
 EDPC 697 Thesis Preparation 1. (6)  
 EDPC 697D1 Thesis Preparation 1. (3)  
 EDPC 697D2 Thesis Preparation 1. (3)  
 EDPC 698 Thesis Preparation 2. (6)  
 EDPC 698D1 Thesis Preparation 2. (3)  
 EDPC 698D2 Thesis Preparation 2. (3)  
 EDPC 699D1 Thesis Preparation 3. (6)  
 EDPC 699D2 Thesis Preparation 3. (6)  
 EDPC 701 Comprehensive Examination. (0)  
 EDPC 701D1 Comprehensive Examination. (0)  
 EDPC 701D2 Comprehensive Examination. (0)  
 EDPC 719 Advanced Small Group Counselling. (3)  
 EDPC 720D1 Seminar Vocational Psychology and Career Development Theory. (3)  
 EDPC 720D2 Seminar Vocational Psychology and Career Development Theory. (3)  
 EDPC 770 Individual Reading Course. (6)  
 EDPC 770D1 Individual Reading Course. (3)  
 EDPC 770D2 Individual Reading Course. (3)  
 EDPC 780 Professional Development. (6)  
 EDPC 782 Doctoral Field Experience. (6)  
 EDPC 786 Seminar: Research Problems in Counselling. (6)  
 EDPC 786D1 Seminar: Research Problems in Counselling. (3)  
 EDPC 786D2 Seminar: Research Problems in Counselling. (3)  
 EDPC 795 Supervised Fieldwork: Counselling. (24)  
 EDPC 799 Thesis. (0)  
 EDPC 799D1 Thesis. (0)  
 EDPC 799D2 Thesis. (0)

**26.6.3 EDPE – Ed Psych & Couns (Psychology)**

**Courses currently scheduled for 2003-04:**

**EDPE 510 LEARNING AND TECHNOLOGY.** (3) Impact of virtual learning communities on learners/teachers in formal schooling and beyond. Information technologies as a resource to enhance learning experiences, creative/critical thinking. Principles of internet design, authoring, management. Evaluation of computer-

based information quality and strategies for efficient and effective use of the technology in education and society.

**EDPE 515 GENDER IDENTITY DEVELOPMENT.** (3) (Prerequisites: EDPE 208, EDPE 300 or a course in developmental psychology) (May be offered through Summer Studies) Theoretical models and empirical findings relevant to the development of gender identity. Special attention is given to the influence of peers in school settings. Psychological, physiological, parental, peer and cultural influences on gender identity.

**EDPE 535 INSTRUCTIONAL DESIGN.** (3) This course draws on the fields of learning theory, developmental psychology, and measurement to focus on the tasks of constructing instructional materials. Areas to be considered include behaviour analysis, concept formation, and test construction.

**EDPE 555 APPLIED COGNITIVE SCIENCE.** (3) Examination of foundations of cognitive science including contributions by psychology, linguistics, and computer science. Consideration of theory and methodology or cognitive science in educational and instructional contexts.

**EDPE 560 HUMAN DEVELOPMENT.** (3) A review of current theory and knowledge of human development through the life cycle. Particular attention is given to emotional and social development. All major age-stages are considered. Emphasis is placed on the effects of interaction between individuals of these different age groupings.

**EDPE 575 EDUCATIONAL MEASUREMENT.** (3) (Also offered through Summer Studies) Statistical measurements in education, graphs, charts, frequency distributions, central tendencies, dispersion, correlation, and sampling errors.

**EDPE 600 CURRENT TOPICS: EDUCATIONAL PSYCHOLOGY.** (3) Current issues and developments and reviews of major areas in educational psychology in the context of research in the Department and the evolution of the discipline at large.

**May be offered as: EDPE 600D1 and EDPE 600D2.**

**EDPE 602 USES OF RESEARCH FINDINGS IN EDUCATION.** (3) (Pre-/Co-requisite: EDPE 575 or equivalent.) Basic concepts of educational research for the student who is likely to be a regular consumer of research but only an occasional generator of research. Mechanics of research: e.g., funding sources, proposal and report preparation, information bases (e.g., the ERIC system), and ethics in research.

**EDPE 603 EDUCATIONAL RESEARCH AND DEVELOPMENT FOR PRACTITIONERS.** (3) (Prerequisite: EDPE 602) Development of research projects and proposals, design and methodology. Emphasis on applied research in school settings. Evaluation of research.

**EDPE 604 THESIS 1.** (3) (Corequisite: EDPE 600) Literature survey and thesis planning.

**EDPE 605 RESEARCH METHODS.** (3) (Corequisite: EDPE 676) Research methods and designs, planning and evaluating research, relations between research and statistical designs, interdisciplinary and nonquantitative approaches, meta-analysis, and the use of computers beyond computation. Ethics, scholarly writing.

**EDPE 607 THESIS 2.** (3) (Corequisite: EDPE 604) Preparation of a thesis proposal.

**EDPE 611 SCHOOL PSYCHOLOGY SEMINAR.** (3) (Open to School/Applied Psychology students only.) Focus on the profession and practice of school psychology. Four major areas of information within the discipline of school psychology will be addressed: history and organizational systems, psychological service delivery in educational settings, ethical and legal issues, and new trends and future developments in school psychology and training.

**EDPE 616 COGNITIVE DEVELOPMENT.** (3) Assessment of theories of cognitive development including Piagetian, neo-Piagetian, and information-processing approaches. Theoretical models and

empirical findings, and their application to educational and other settings.

**EDPE 619 CHILD AND ADOLESCENT THERAPY.** (3) (For School/ Applied Child Psychology students only.) Therapeutic models for individual and group interventions for children and adolescents; case histories; gender and cultural minority issues; emphasis on classical and innovative strategic and methods for school and counselling psychologists.

**EDPE 620 DEVELOPMENTAL PSYCHOPATHOLOGY.** (3) (Prerequisite: EDPE 615) Theory, research, and practice in developmental processes in the study of psychopathology, including aberrant behavior in childhood, at-risk and resilient children, and mental illness.

**EDPE 623 SOCIAL-EMOTIONAL DEVELOPMENT.** (3) (Prerequisites: EDPE 615, EDPE 616 or EDPE 620) Social-emotional development including temperament, attachment, gender identity, and peer relations. Biological and environmental influences, continuity and change, and qualitative versus quantitative variables.

**EDPE 625 PRACTICUM 1: SCHOOL PSYCHOLOGY.** (3) (Prerequisites: EDPC 609, EDPC 610, EDPC 618, EDPI 654, EDPE 611, EDPE 616. Corequisites: EDPC 682, EDPE 620.) Clinic experiences (normally 8-10 hours/week) (a) conducting assessment batteries, (b) interpreting assessment findings and developing intervention plans, (c) providing remedial services for specific learning domains and practical recommendations, (d) acquiring skills in group intervention techniques. Weekly case review and student progress meetings.

**EDPE 626 PRACTICUM 2: SCHOOL PSYCHOLOGY.** (3) (Prerequisites: EDPE 620, EDPE 625. Corequisite: EDPC 682) Clinic experiences (normally 8-10 hours/week) building upon EDPE 625: (a) conducting assessment batteries, (b) interpreting assessment findings and developing intervention plans, (c) providing remedial services for specific learning domains and practical recommendations, (d) acquiring skills in group intervention techniques. Weekly case review and student progress meetings. May continue to the end of the public school year.

**EDPE 629D1 SCHOOL PSYCHOLOGY RESEARCH PROJECT.** (3) (Prerequisites: EDPC 618, EDPE 605. Corequisite: EDPE 682) Open to School/Applied Child Psychology students. An individually supervised research project in school/applied child psychology.

**EDPE 629D2 SCHOOL PSYCHOLOGY RESEARCH PROJECT.** (3)

**EDPE 635 THEORIES OF LEARNING AND INSTRUCTION.** (3) An analysis of the relationship between theory and research about learning and teaching from a historical perspective.

**EDPE 636 CLASSROOM PROCESSES - SOCIAL.** (3) Instructional or environmental effects on learning and their implications for educational practice, with particular emphasis on such topics as the social psychology of learning, family background and effects, classroom interaction, teacher impact, and ethnographic and survey approaches to their study.

**EDPE 648 INSTRUCTIONAL PSYCHOLOGY SEMINAR.** (3) (Prerequisite: EDPE 635) An advanced course intended to provide a framework for the review of theoretical and methodological issues in the field.

**EDPE 650 CONSCIOUSNESS AND VIRTUAL REALITY.** (3) An exploration of the nature and role of consciousness from the virtual reality research perspective, and the implications of virtual reality and cyberspace in education.

**EDPE 656 APPLIED COGNITIVE THEORY/METHODS.** (3) (Prerequisite: EDPE 555 or permission of instructor.) Models of knowledge representation, cognitive architectures, and cognitive processes for complex domains of performance and instruction. Methods of data collection that allow testing of models of performance and learning in such domains.

**EDPE 661 DISCOURSE PROCESSES AND EDUCATION.** (3) (Prerequisites: EDPE 655, EDPE 656 or permission of the instructor.) Models of discourse representation and processing in realistic

settings. Implications of such models for knowledge elaboration, transfer, and acquisition.

**EDPE 665 REASONING AND PROBLEM SOLVING.** (3) (Prerequisites: EDPE 655, EDPE 656 or permission of the instructor.) Seminar on theories and methods for research on human problem solving in educational and other complex situations. Includes the development of problem-solving skills.

**EDPE 666 COGNITION AND INSTRUCTION.** (3) (Corequisite: a graduate course in cognitive or instructional psychology.) Relationships between instructional design and cognitive models. Analysis of instruction and instructional environments from a cognitive perspective.

**EDPE 668 ADVANCED SEMINAR COGNITIVE.** (3) (Prerequisite: EDPE 655 or permission of the instructor) Examination of research, professional and theoretical topics extending beyond the prerequisite course, as applied to education.

**EDPE 676 INTERMEDIATE STATISTICS 2.** (3) (Prerequisite: EDPE 675 or equivalent.) Analysis of variance and covariance, fixed, random and mixed effects, crossed and nested designs; regression models. Computer data processing using existing packages.

**EDPE 682 UNIVARIATE/MULTIVARIATE ANALYSIS.** (3) (Prerequisite: EDPE 676) General linear model as a unified data analytic system for estimation and hypothesis testing that subsumes regression, analysis of variance, and analysis of covariance for single dependent variables. Introduction to generalizations involving multiple dependent (criterion) variables. Applications oriented toward education, educational psychology and counselling psychology. Experience with data-analysis tools.

**EDPE 684 APPLIED MULTIVARIATE STATISTICS.** (3) (Prerequisite: EDPE 682 or equivalent.) Principal methods, models, and hypothesis-testing procedures for the prediction and analysis of patterns, structure, and relationships in multivariate data, e.g., discriminant, principal components, canonical correlation, profile analyses, measurement models, factor and path analysis, repeated measures. Applications oriented toward education and educational and counselling psychology. Experience with data-analysis tools.

**EDPE 693 THESIS 3.** (3) Thesis research under supervision of a research director.

**EDPE 694 THESIS 4.** (3) Thesis research under supervision of a research director.

**EDPE 695 THESIS 5.** (6) Thesis research under supervision of a research director.

**May be offered as: EDPE 695D1 and EDPE 695D2.**

**EDPE 696 THESIS 6.** (6) Thesis research under supervision of a research director.

**May be offered as: EDPE 696D1 and EDPE 696D2.**

**EDPE 697 SPECIAL ACTIVITY 1.** (6)

**May be offered as: EDPE 697D1 and EDPE 697D2.**

**EDPE 698D1 SPECIAL ACTIVITY 2.** (3) A project relevant to improving educational practice. It may be an internship, a research project, or an innovation in teaching supervised by the student's advisor and with the approval of the department. It is completed by the submission of a project report, monograph, or production. For M.Ed. students only.

**EDPE 698D2 SPECIAL ACTIVITY 2.** (3)

**EDPE 708D1 COMPREHENSIVE EXAMINATION.** (3) A four-part evaluation which is normally taken at the end of the Ph.D. 2 year. A detailed description of the examination is provided to all students.

**EDPE 708D2 COMPREHENSIVE EXAMINATION.** (3)

**EDPE 710 CONSULTATION IN SCHOOL PSYCHOLOGY.** (3) (Corequisites: EDPE 625, EDPE 626 or equivalent.) Open only to students in School/Applied Child Psychology and with permission, Counselling Psychology and Special Populations Major. A clinical course on the use of consultation in educational and school-related settings. Topics include: consultation theory, the process of evaluations of the consultation process and outcomes, critical study of relevant research and practice. Includes problem identifi-

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 722 or EDPE 723)) Open only to Ph.D. students in School/Applied Child Psychology. A 2 1/2 day, 10 to 12-month supervised internship (minimum 600 hours) including assessment and diagnosis normally in a school-based setting. This also includes group supervision to discuss cases that arise in internship settings. May be combined with EDPE 726 in a single full-time year long internship; this full-time pattern is typical in accredited sites.

**EDPE 725D2 INTERNSHIP 1 - SCHOOL PSYCHOLOGY.** (6)

**EDPE 726D1 INTERNSHIP 2 - SCHOOL PSYCHOLOGY.** (6) (Prerequisites: EDPE 708 and two of EDPE 721, EDPE 722 or EDPE 723) Open only to Ph.D. students in School/Applied Child Psychology. A 2 1/2 day, 10 to 12-month supervised internship (minimum 600 hours) including assessment and diagnosis normally in an educationally relevant community-based center (e.g., hospital, clinic), group supervision, case discussions. May be combined with EDPE 725 in a single full-time year long internship; this full-time pattern is typical in accredited sites.

**EDPE 726D2 INTERNSHIP 2 - SCHOOL PSYCHOLOGY.** (6)

#### Other courses:

EDPE 564 Family Communication. (3)  
 EDPE 595 Seminar in Special Topics. (3)  
 EDPE 596 Seminar in Special Topics. (3)  
 EDPE 609 Selected Topics in Educational Psychology. (3)  
 EDPE 622 Multiculturalism and Gender. (3)  
 EDPE 627 Professional Practice of Psychology. (3)  
 EDPE 629 School Psychology Research Project. (6)  
 EDPE 640 Research in Computer Applications. (3)  
 EDPE 641 Use of Computer in Educational Instruction. (6)  
 EDPE 641D1 Use of Computer in Educational Instruction. (3)  
 EDPE 641D2 Use of Computer in Educational Instruction. (3)  
 EDPE 643 Evaluation - Computer Software and Hardware. (3)  
 EDPE 645 Research on Instructional Processes. (3)  
 EDPE 655 Cognitive Science and Education. (3)  
 EDPE 660 Artificial Intelligence in Education. (3)  
 EDPE 662 Psycholinguistics and Learning. (3)  
 EDPE 670 Educational Evaluation. (3)

EDPE 675 Intermediate Statistics 1. (3)  
 EDPE 687 Advanced Qualitative Methods. (3)  
 EDPE 691 Reading Course. (3)  
 EDPE 691D1 Reading Course. (1.5)  
 EDPE 691D2 Reading Course. (1.5)  
 EDPE 692 Reading Course. (6)  
 EDPE 692D1 Reading Course. (3)  
 EDPE 692D2 Reading Course. (3)  
 EDPE 698 Special Activity 2. (6)  
 EDPE 708 Comprehensive Examination. (6)  
 EDPE 721 School Psychology: Elementary. (6)  
 EDPE 722 School Psychology: Secondary. (6)  
 EDPE 723 School Psychology: Community. (6)  
 EDPE 725 Internship 1 - School Psychology. (12)  
 EDPE 726 Internship 2 - School Psychology. (12)

#### 26.6.4 EDPH – Ed Psych & Couns (Collegial)

##### Courses currently scheduled for 2003-04:

**EDPH 681 HIGHER EDUCATION DEVELOPMENT.** (3) (Corequisite: EDPH 582 or permission of instructor) Analysis of program and curriculum development across disciplines and multidisciplinary areas of study at the postsecondary level. Program organization and planning in particular disciplinary areas and in relation to that of other disciplines.

**EDPH 689 TEACHING AND LEARNING IN HIGHER EDUCATION.** (3) Students will develop an understanding of teaching and learning as a process in which instruction is based on the learning to be accomplished. Students will design, develop, and evaluate a university course of their choice, and will develop facility and confidence in using teaching methods appropriate to their domains.

#### 26.6.5 EDPI – Ed Psych & Couns (Inclusive)

##### Courses currently scheduled for 2003-04:

**EDPI 526 TALENTED AND GIFTED STUDENTS.** (3) (May be offered through Continuing Education) The psychology and education of exceptionally able children. Definitions, assessment, classroom adaptations, technology, educational programs and educational issues. The course combines theoretical background and practical concerns. Application component: application of teaching methods with exceptionally able students.

**EDPI 527 CREATIVITY AND ITS CULTIVATION.** (3) (May be offered through Continuing Education) Recent research, theory, and educational practice concerning creativity, with special attention to creativity in students and educational settings.

**EDPI 539 FIELD WORK 1: EXCEPTIONAL STUDENTS.** (3) (Open only to Education students with permission of Program Director) Supervised experience with exceptional students in an approved educational setting.

**EDPI 540 FIELD WORK 2: EXCEPTIONAL STUDENTS.** (3) (Prerequisite: EDPI 539) (Open only to Education students with permission of Program Director) Supervised experience with exceptional students in an approved educational setting.

**EDPI 642 EDUCATIONAL OF LEARNERS/SPECIAL NEEDS 1.** (3) Introduction to learners with different types of special needs. Emphasis on current research and practice of educating students with special needs.

**EDPI 643 EDUCATION OF LEARNERS/SPECIAL NEEDS 2.** (3) Contemporary issues in the education of students with special needs: assessment and identification; service delivery models; instructional methods; parent/professional relationships; research priorities; legislative policies; adult education; employment training.

**EDPI 645 DIAGNOSIS AND ASSESSMENT IN SPECIAL EDUCATION.** (3) Purposes of diagnosis and assessment; formal and informal assessment procedures; issues in traditional testing procedures; emerging trends in assessment.

**EDPI 656D1 CLINIC PRACTICUM IN SPECIAL EDUCATION.** (3) Participation as a special education professional in a field setting.

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 LEARNING DISABILITIES.** (3) Review of recent research and literature in the field of learning disabilities; examination of research and theory as it relates to current practices.

**EDPI 667 BEHAVIORAL AND EMOTIONAL PROBLEMS.** (3) (Prerequisite: EDPE 615 or EDPI 643) Behavioral and emotional problems examined from different psychological perspectives. Theoretical issues and behavior management applications in educational settings.

#### Other courses:

EDPI 536 Practicum Gifted Education 1. (3)

EDPI 537 Practicum Gifted Education 2. (3)

EDPI 543 Family, School and Community. (3)

EDPI 603 Reading Course. (6)

EDPI 603D1 Reading Course. (3)

EDPI 603D2 Reading Course. (3)

EDPI 616 Individual Reading Course. (3)

EDPI 637 Adolescent Depression. (3)

EDPI 654 Instruction/Curriculum Adaption. (3)

EDPI 656 Clinic Practicum in Special Education. (6)

EDPI 657 Practicum: Learning Disabilities. (3)

EDPI 658 Internship: Learning Disabilities. (3)

EDPI 663 Instruction: Integrated Settings. (3)

EDPI 664 Leadership and Change in Special Education. (3)

EDPI 680 Selected Topics in Special Education 1. (3)

EDPI 681 Selected Topics in Special Education 2. (3)

EDPI 743 Seminar on Special Needs. (3)

EDPI 756 Internship/Special Needs Education. (3)

EDPI 756D1 Internship/Special Needs Education. (1.5)

EDPI 756D2 Internship/Special Needs Education. (1.5)

#### COURSES IN OTHER DEPARTMENTS

Students are encouraged to broaden their perspectives with elective courses from elsewhere in the Faculty of Education and the University as a whole. Eligibility to enrol in a specific course should always be ascertained in advance.

Students interested in statistical models and techniques in test theory are welcome to enrol in PSYC 510 offered by the Department of Psychology.

**PSYC 510 STATISTICAL ANALYSIS OF TESTS.** (3) (3 lectures) This course aims to introduce students interested in developing or appraising tests to the important statistical problems and modern techniques associated with testing data. Testing situations discussed will range from one-shot classroom tests through special purpose scales to the highly refined large scale tests such as the SAT.

Qualitative research methods are offered primarily through EDPE 687 and EDEM 692 or EDSL 630 offered by the Department of Integrated Studies in Education.

**EDEM 692 QUALITATIVE RESEARCH METHODS.** (3) Theoretical and practical exploration of the foundations of qualitative methods, with emphasis on underlying principles.

**EDSL 630 QUALITATIVE/ETHNOGRAPHIC STUDIES.** (3) An examination of theoretical and applied issues in qualitative and ethnographic studies in second language education.

**EDEC 635 ADVANCED WRITTEN COMMUNICATION.** (3) Rhetorical practices and principles that remain constant across disciplines: generating and organizing ideas; setting goals; planning; considering readers; editing and revising. Students will analyze and produce texts that use the formats, rhetorical strategies, styles, genres, and other conventions of their disciplines.

## 27 Electrical and Computer Engineering

Department of Electrical and Computer Engineering  
McConnell Engineering Building, Room 633  
3480 University Street  
Montreal, QC H3A 2A7

Telephone: (514) 398-7344

Fax: (514) 398-4470

E-mail: grad@ece.mcgill.ca

Web site: [www.mcgill.ca/ece](http://www.mcgill.ca/ece)

Chair — David A. Lowther

Associate Chair (Director, Graduate Program) —  
Jonathan P. Webb

### 27.1 Staff

#### Emeritus Professors

Eric L. Adler; B.Sc.(Lond.), M.A.Sc.(Tor.), Ph.D.(McG.), F.I.E.E.E., Eng.

Gerry W. Farnell; B.A.Sc.(Tor.), S.M.(M.I.T.), Ph.D.(McG.), F.I.E.E.E., Eng.

Tomas J.F. Pavlasek; B.Eng., M.Eng., Ph.D.(McG.), Eng.

#### Post-Retirement

Maier L. Blostein; B.Eng., M.Eng.(McG.), Ph.D.(Ill.), F.I.E.E.E., Eng.

Clifford H. Champness; M.Sc.(Lond.), Ph.D.(McG.)

Nicholas C. Rumin; B.Eng., M.Sc., Ph.D.(McG.), Eng.

#### Professors

Pierre R. Bélanger; B.Eng.(McG.), S.M., Ph.D.(M.I.T.), F.I.E.E.E., Eng.

Peter E. Caines; B.A.(Oxon), D.I.C. Ph.D.(Lond.), F.I.E.E.E., F.C.I.A.R. (*Macdonald Professor of Electrical Engineering*)

Frank D. Galiana; B.Eng.(McG.), S.M., Ph.D.(M.I.T.), F.I.E.E.E., Eng.

Geza Joos; B.Sc.(C'ria), M.Eng. Ph.D.(McG.)

Peter Kabal; B.A.Sc., M.A.Sc., Ph.D.(Tor.)

Tho Le-Ngoc; M.Eng.(McG.), Ph.D.(Ott.), F.I.E.E.E.

Harry Leib; B.Sc.(Technion), Ph.D.(Tor.)

Martin D. Levine; B.Eng., M.Eng.(McG.), Ph.D.(Lond.), F.C.I.A.R., F.I.E.E.E., Eng.

David A. Lowther; B.Sc.(Lond.), Ph.D.(C.N.A.A.), F.C.A.E., Eng.

Boon-Teck Ooi; B.E.(Adel.), S.M.(M.I.T.), Ph.D.(McG.), Eng.

Gordon Roberts; B.A.Sc.(Wat.), M.A.Sc., Ph.D.(Tor.), Eng. (*James McGill Professor*)

Jonathan P. Webb; B.A., Ph.D.(Cantab.)

#### Associate Professors

Benoit Champagne; B.Eng., M.Eng.(Montr.), Ph.D.(Tor.)

James Clark; B.Sc., Ph.D.(Br.Col.)

Frank Ferrie; B.Eng., Ph.D.(McG.)

Vincent Hayward; Dip.d'Ing.(ENSM, Nantes), Doc.Ing.(Orsay), Eng.

Steve McFee; B.Eng., Ph.D.(McG.)

Hanna Michalska; B.Sc., M.Sc.(Warsaw), Ph.D.(Lond.)

David V. Plant; M.S., Ph.D.(Brown) (*James McGill Professor*)

Ishiang Shih; M.Eng., Ph.D.(McG.)

#### Assistant Professors

Tal Arbel; M.Eng., Ph.D.(McG.)

Jan Bajcsy; B.Sc.(Harv.), M.Eng., Ph.D.(Prin.)

Benoit Boulet; B.Sc.(Laval), M.Eng.(McG.) Ph.D.(Tor.)

Lawrence Chen, B.Eng.(McG.), M.A.Sc., Ph.D.(Tor.)

Mark Coates; B.Eng.(Australia), Ph.D.(Camb.)

Jeremy R. Cooperstock; A.Sc.(U.B.C.), M.Sc., Ph.D.(Tor.)

Mourad El-Gamal; B.Sc.(Cairo), M.Sc.(Nashville), Ph.D.(McG.)

Dennis Giannacopoulos; M.Eng., Ph.D.(McG.)

Andrew Kirk; B.Sc.(Brist.), Ph.D.(Lond.) (*William Dawson Scholar*)

Fabrice Labeau, M.S., Ph.D.(Louvain)

Radu Negulescu; M.Sc.(Romania), M.Sc.(France), Ph.D.(Wat.)

Milica Popovich; B.Sc.(Colo.), M.Sc., Ph.D.(Northwestern)

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

## 27.2 Programs Offered

The Department offers programs of graduate studies leading to a degree of Master of Engineering or Doctor of Philosophy.

An equivalent of one (1) calendar year of full time study is required to obtain a Master's in Engineering.

The Ph.D. program maintains a requirement of the equivalent of two (2) calendar years of full time study besides the requirements for the Master's degree.

The research interests and facilities of the Department are very extensive, involving more than 30 faculty members and 200 post-graduate students. The major activities are divided into the following groups: Biomedical Engineering, Communications Systems, Computer Vision and Robotics, Computational Analysis for Engineering Design, Software Systems for Intelligent Design, Electronic Devices and Materials, High Frequency Electromagnetics and Optics, Power Engineering, Systems and Control, Microelectronics and Computer Systems, and Photonics.

### Research Facilities

The Department has extensive laboratory facilities for all its main research areas. In addition, McGill University often collaborates with other Institutions for teaching and research.

- The laboratories for research in Robotics, Control and Vision are in the Centre for Intelligent Machines (CIM).
- Telecommunications laboratories focus their work on signal compression and wireless communications. These laboratories form part of the Canadian Institute for Telecommunications Research (CITR). This is a federally funded network of Centers of Excellence.
- The Microelectronics and Computer System (MACS) Laboratory supports research in VLSI, mixed signal circuits, design for testability, formal methods telecommunications, computing and optical systems.
- Antenna and microwave research, and optical fiber and integrated optics research are carried out in a fully equipped facility.
- The Photonics Systems laboratory includes continuous wave and femtosecond Ti:Sapphire lasers, diode lasers, extensive optics and optomechanics, and sophisticated electronic and imaging equipment.
- Solid state facilities include measurement equipment for magnetic and electric properties of materials, vacuum deposition and RF sputtering systems.
- The Computational Analysis and Design Laboratory provides tools for numerical analysis, visualization, interface design and knowledge-based system development.
- There is also a well-equipped laboratory for power electronics and power systems research.

The Department has extensive computer facilities. Most research machines are networked providing access to a vast array of hard-

ware. In addition, McGill University is linked to the Centre de Recherche Informatique de Montréal (CRIM) and the University Computing Centre.

There are three other universities in Montreal: Concordia University is the other English-language university; l'Université de Montréal, and its affiliated school of engineering, l'Ecole Polytechnique, is the largest Francophone university; l'Université du Québec has a campus in Montreal and in major towns throughout the province.

The proximity of these schools to McGill University ensures a rich array of courses is available to suit individual needs. McGill also collaborates on research projects with many organizations such as l'Institut Nationale de la Recherche de l'Hydro-Québec (IREQ) and l'Institut National de la Recherche Scientifique (INRS).

### Financial Support

**Graduate Assistantships:** The Department awards a number of graduate assistantships that carry an annual stipend of approximately Can\$15,000 per year to qualified full-time graduate students. These are normally funded from research grants or contracts awarded to individual faculty members. In return, the graduate assistant is expected to perform research-related tasks assigned by the professor from whose grant the assistantship is paid. A good part, but not necessarily all, of this work can be used for preparing a thesis. There is no special application form for graduate assistantships; all applicants who indicate a need for support on their application forms will be considered. A large fraction of research funding comes from Canadian Government agencies, with the stipulation that only graduate students who are either Canadian citizens or Permanent Residents may be supported. Consequently, graduate assistantships can be offered to a very small number of international students. They should also note that Canadian authorities will not grant an Immigrant Visa to a foreign national who wishes to enter Canada to study.

**Teaching Assistantships:** Graduate students, with the approval of their supervisors, may also undertake teaching assistantship for an additional remuneration of between Can\$400 to Can\$3,000 per year. These are awarded at the beginning of the term. The Department can make no prior commitments.

**Differential Fee Waivers:** All eligible visa students accepted or registered in a full-time term of residency will be considered for a limited number of waivers that reduce international tuition fees to the equivalent of Canadian tuition fees. McGill bases awards entirely on academic merit.

Graduate students can also receive financial aid through fellowships, loans or bursaries. For more information, please refer to the Fellowships and Awards Web site at [www.mcgill.ca/gps](http://www.mcgill.ca/gps), or contact the Graduate and Postdoctoral Studies Office, McGill University, James Administration Building, Room 400, 845 Sherbrooke Street West, Montreal, QC H3A 2T5.

## 27.3 Admission Requirements

**TOEFL Requirement:** Non-Canadian applicants whose mother tongue is not English and who have not completed an undergraduate degree using the English language, must submit documented proof of competency in English by a Test of English as a Foreign Language (TOEFL) with a score not below 600 on the paper-based test (250 on the computer-based test) or IELTS with a minimum overall band of 7.0. Permanent Residents may also be required to submit TOEFL results. Official results must be received before February 1st.

**GRE Requirement:** A GRE score on the General Aptitude Test is required by all students who have completed their undergraduate degrees outside Canada. Starting October 2002, there have been some changes in the GRE test. For students who registered for the GRE after that date, a minimum total score of 1100 for the verbal and quantitative sections is required. There is no minimum for the new analytical writing section for students applying for the 2003-04 academic year. Students who took the GRE prior to Octo-

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](http://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 level courses (with a grade of B or better) of which four courses must be chosen from the Department (ECSE 5xx or ECSE 6xx), plus research leading to a Master's thesis (28 credits), the total amounting to at least 46 credits. Students who are required to take more than two 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 three.

The following are the thesis component courses:

ECSE 691 Thesis Research 1	4 credits
ECSE 692 Thesis Research 2	4 credits
ECSE 693 Thesis Research 3	4 credits
ECSE 694 Thesis Research 4	4 credits
ECSE 695 Thesis Research 5	4 credits
ECSE 696 Thesis Research 6	4 credits
ECSE 697 Thesis Research 7	4 credits
Total credit weight of thesis:	28 credits

Students who choose the thesis option must register for all 28 credits during the course of study. Students in the thesis option

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

#### M.Eng. Thesis - Computational Science and Engineering (CSE) Option (47 credits)

##### Required Courses (29 credits)

ECSE 691	(4)	Thesis Research 1
ECSE 692	(4)	Thesis Research 2
ECSE 693	(4)	Thesis Research 3
ECSE 694	(4)	Thesis Research 4
ECSE 695	(4)	Thesis Research 5
ECSE 696	(4)	Thesis Research 6
ECSE 697	(4)	Thesis Research 7
MATH 669D1	(.5)	CSE Seminar
MATH 669D2	(.5)	CSE Seminar

##### Complementary Courses (minimum 18 credits)

Six courses at the graduate level (500 or above) are required (minimum 18 credits), with a grade of B or better. Two courses (minimum 6 credits) from List A, and two courses (minimum 6 credits) from List B. At least two of the courses taken from Lists A and B must be from outside the Department of Electrical and Computer Engineering.

##### List A - Scientific Computing Courses:

CIVE 602	(4)	Finite Element Analysis
COMP 522	(4)	Modelling and Simulation
COMP 540	(3)	Matrix Computations
COMP 566	(3)	Discrete Optimization 1
MATH 578	(4)	Numerical Analysis 1
MATH 579	(4)	Numerical Differential Equations

##### List B - Applications and Specialized methods Courses:

ATOC 512	(3)	Atmospheric and Oceanic Dynamics
ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
CIVE 514	(3)	Structural Mechanics
CIVE 572	(3)	Computational Hydraulics
CIVE 603	(4)	Structural Dynamics
CIVE 613	(4)	Numerical Methods: Structural Engineering
COMP 505	(3)	Advanced Computer Architecture
COMP 557	(3)	Computer Graphics
COMP 558	(3)	Fundamentals of Computer Vision
COMP 567	(3)	Discrete Optimization 2
COMP 621	(4)	Optimizing Compilers
COMP 642	(4)	Numerical Estimation
ECSE 507	(3)	Optimization and Optimal Control
ECSE 532	(3)	Computer Graphics
ECSE 547	(3)	Finite Elements in Electrical Engineering
ECSE 549	(3)	Expert Systems in Electrical Design
MATH 555	(4)	Fluid Dynamics
MATH 560	(4)	Optimization
MATH 651	(4)	Asymptotic Expansion and Perturbation Methods
MECH 533	(3)	Subsonic Aerodynamics
MECH 537	(3)	High-Speed Aerodynamics
MECH 538	(3)	Unsteady Aerodynamics
MECH 539	(3)	Computational Aerodynamics
MECH 541	(3)	Kinematic Synthesis
MECH 545	(3)	Advanced Stress Analysis
MECH 572	(3)	Introduction to Robotics
MECH 573	(3)	Mechanics of Robotic Systems
MECH 576	(3)	Computer Graphics and Geometrical Modelling
MECH 577	(3)	Optimum Design
MECH 610	(4)	Fundamentals of Fluid Dynamics
MECH 620	(4)	Advanced Computational Aerodynamics
MECH 632	(4)	Theory of Elasticity
MECH 642	(4)	Advanced Dynamics
MECH 650	(4)	Heat Transfer
MECH 654	(4)	Compt. Fluid Flow and Heat Transfer

Students who choose the thesis option must register for all 29 credits during the course of study. Students in the thesis option

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.

The following are the project component courses:

ECSE 651 M. Eng. Project 1	1 credit
ECSE 652 M.Eng. Project 2	2 credits
ECSE 653 M.Eng. Project 3	3 credits
ECSE 654 M.Eng. Project 4	4 credits
ECSE 655 M.Eng. Project 5	5 credits
ECSE 656 M.Eng. Project 6	5 credits
Total number of project credits:	20 credits

The credits assigned to the project can vary between 11 and 20 depending on the number of course credits taken. A part-time program is possible.

Non-thesis option students have an oral presentation and two examiners grade their project.

#### Ph.D. Program Requirements

To complete the doctoral program, the following requirements must be met.

- Successful completion of the courses prescribed by the student's Supervisory Committee.
- Completion of a minimum of two units (100 hours) of teaching work (tutoring or lab demonstration). A written confirmation of the type of teaching work done either inside or outside the Department must be submitted to the Department.
- Passing the Qualifying Examination (course ECSE 701). Students must register for this course upon admission to the doctoral program. It is recommended that the exam take place within one year of admission to the doctoral program. The contents of the Qualifying Examination are set at the Preliminary Meeting. The examiners at the Qualifying Examination include the student's Supervisory Committee together with any other examiners chosen by the committee. Successful completion of this course will award the student a PASS grade in the course ECSE 701.
- Approval of the thesis proposal submitted by the student (course ECSE 702). Students must register for this course upon successful completion of the course ECSE 701. It should be completed within one year of the Qualifying Examination. The student must present a brief written thesis proposal to the Supervisory Committee. The proposal should contain a statement of the proposed research, results already obtained, if any, and expected results. The proposal is to be received by members of the Committee in advance of its presentation. The format of the thesis proposal submission is an oral presentation of the written statement by the student and then a period in which he/she will be questioned on the proposal by the Supervisory Committee. When the proposal is accepted by the Supervisory committee, the student receives a PASS grade in the course ECSE 702.
- Passing the final thesis defense conducted by the Graduate and Postdoctoral Studies Office.

## 27.6 Courses

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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, along with the number of weekly contact hours (lectures, lab/tutorials) and expected hours of study, e.g., (3) (3-0-6) indicates 3 credits (3 lecture hours - no other contact hours - 6 hours of personal study).

- Denotes courses not offered in 2003-04.

**ECSE 501 LINEAR SYSTEMS.** (3) (3-0-6) (Prerequisite: ECSE 304) State equations and input-output descriptions of linear systems: basic properties and solution. Observability and controllability. Matrix Fraction Descriptions. Canonical forms. Feedback synthesis: linear quadratic control problems, pole placement, observers and compensators.

**ECSE 502 CONTROL ENGINEERING.** (3) (3-0-6) (Prerequisites: ECSE 303, ECSE 305) Modeling of engineering systems, simulation. Linear systems theory. Performance limitations. Stability of single-input-single-output closed-loop systems. Classical design in the frequency domain. Sampled-data implementation of continuous-time design.

● **ECSE 504 COMPUTER CONTROL.** (3) (3-0-6) (Prerequisites: ECSE 404 or ECSE 502 and ECSE 305)

**ECSE 505 NONLINEAR CONTROL SYSTEMS.** (3) (3-0-6) (Prerequisite: ECSE 501) Basic ODE formulation of non-linear systems; structural properties; Lyapunov and LaSalle stability theory and nonlinear and multivariable controller design; input-output stability; small gain theorem, conservation, passivity; system linearization, zero and inverse dynamics and regulator design; discontinuous and sliding mode control; applications to deterministic adaptive control.

**ECSE 507 OPTIMIZATION AND OPTIMAL CONTROL.** (3) (3-0-6) (Prerequisites: MATH 265 or MATH 248 and MATH 270 or MATH 247) General Introduction to optimization methods including steepest descent, conjugate gradient, Newton algorithms. Generalized matrix inverses and the least squared error problem. Introduction to constrained optimality; convexity and duality; interior point methods. Introduction to dynamic optimization; existence theory, relaxed controls, the Pontryagin Maximum Principle. Sufficiency of the Maximum Principle.

**ECSE 509 PROBABILITY AND RANDOM SIG. 2.** (3) (3-0-6) (Prerequisites: ECSE 304 and ECSE 305) Multivariate Gaussian distributions; finite-dimensional mean-square estimation (multivariate case); principal components; introduction to random processes; weak stationarity: correlation functions, spectra, linear processing and estimation; Poisson processes and Markov chains: state processes, invariant distributions; stochastic simulation.

**ECSE 510 RANDOM PROCESSES.** (3) (3-0-6) (Prerequisite: ECSE 509) Finite-dimensional distribution functions. Estimation, Orthogonal Projection Theorem. Linear stochastic systems; Kalman filtering. Stationary stochastic processes: spectral Representation Theorem, Wiener filtering, Wold decomposition; ARMA processes. Brownian Motion; Ito integral and stochastic differential equations; forward and backward equations for diffusions. Ergodic theorems. Stochastic dynamic programming. Applications to communication and control systems.

**ECSE 511 INTRODUCTION TO DIGITAL COMMUNICATION.** (3) (3-0-6) (Prerequisite: ECSE 304. Corequisite: ECSE 509) (An advanced version of ECSE 411) (Tutorials assigned by instructor.) Amplitude and angle modulation including AM, FM, FDM and television systems; introduction to random processes; sampling and quantization, PCM systems, TDM; digital modulation techniques, Maximum-Likelihood receivers, synchronization issues; elements of information theory including information sources, source coding and channel capacity.

**ECSE 512 DIGITAL SIGNAL PROCESSING 1.** (3) (3-0-6) (Prerequisite: ECSE 304 and ECSE 305) Review of discrete-time transforms, sampling and quantization, frequency analysis. Structures for IIR and FIR filters, coefficient quantization, roundoff noise. The DFT, its properties, frequency analysis and filtering using DFT

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

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

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

**ECSE 523 SPEECH COMMUNICATIONS.** (3) (3-0-6) (Prerequisite: ECSE 412 or ECSE 512) Articulatory and acoustic descriptions of speech production, speech production models, speech perception, digital processing of speech signals, vocoders using formant, linear predictive and cepstral techniques, overview of automatic speech recognition systems, speech synthesis systems and speaker verification systems.

● **ECSE 525 COMPUTER ARCHITECTURE.** (3) (3-0-6) (Prerequisites: ECSE 322 and ECSE 323)

**ECSE 526 ARTIFICIAL INTELLIGENCE.** (3) (3-0-6) (Prerequisite: ECSE 322) Design principles of autonomous agents, agent architectures, machine learning, neural networks, genetic algorithms, and multi-agent collaboration. The course includes a term project that consists of designing and implementing software agents that collaborate and compete in a simulated environment.

**ECSE 527 OPTICAL ENGINEERING.** (3) (3-0-6) (Prerequisite: ECSE 304 and ECSE 352) A structure introduction to modern optical engineering. Topics covered include the propagation of light through space, refraction, diffraction, polarization, lens systems, ray-tracing, aberrations, computer-aided design and optimization techniques, Gaussian beam analysis, micro-optics and computer generated diffractive optical elements. Systems and applications will be stressed throughout.

**ECSE 528 TELECOMMUNICATION NETWORK ARCHITECTURE.** (3) (3-0-6) (Prerequisite: ECSE 411 or ECSE 511. Corequisite: ECSE 509) Organization of large, highspeed, multiservice telecommunication networks. Connection hierarchies, protocol stacks, transmission formats. Local-area networking: Token Ring and Ethernet. Multiplexing for wide-area transport: performance modelling and analysis, traffic scheduling and shaping. Routing and flow control. Switch architecture: performance criteria, buffer management, routers versus switches and hybrids.

**ECSE 529 IMAGE PROCESSING AND COMMUNICATION.** (3) (3-0-6) (Prerequisite: ECSE 304) Introduction to vision in man and machine; computer vision systems; biological vision systems; biological signal processing; edge detection; spatial- and frequency-domain processing; color. Low-level visual processing in computer vision, psychophysics, and neurobiology, and their similarities and differences.

● **ECSE 530 LOGIC SYNTHESIS.** (3) (3-2-4) (Prerequisite: ECSE 323)

● **ECSE 531 REAL TIME SYSTEMS.** (3) (3-3-3) (Prerequisites: ECSE 322 and ECSE 323)

**ECSE 532 COMPUTER GRAPHICS.** (3) (3-3-3) (Prerequisite: ECSE 322) Introduction to computer graphics systems and display devices: raster scan, scan conversion, graphical input and interactive techniques - window environments; display files: graphics languages and data structures: 2D transformations; 3D computer graphics, hidden line removal and shading; graphics system design; applications. Laboratory project involving the preparation and running of graphics programs.

**ECSE 533 PHYSICAL BASIS OF SEMICONDUCTOR DEVICES.** (3) (3-0-6) (Prerequisites: ECSE 330, ECSE 351 and PHYS 271) Quantitative analysis of diodes and transistors. Semiconductor fundamentals, equilibrium and non-equilibrium carrier transport, and Fermi levels. PN junction diodes, the ideal diode, and diode

switching. Bipolar Junction Transistors (BJT), physics of the ideal BJT, the Ebers-Moll model. Field effect transistors, metal-oxide semiconductor structures, static and dynamic behaviour, small-signal models.

**ECSE 534 ANALOG MICROELECTRONICS.** (3) (3-0-6) (Prerequisite: ECSE 334) Design of analog ICs using specialized analog CAD tools such as SPICE. Voltage and current amplifier design which encompasses the study of biasing circuits, current sources and mirrors, input and output stages, and frequency compensation; precision reference sources; analog multipliers; oscillators; waveform generators and shaping circuits, and analog switches.

**ECSE 536 RF MICROELECTRONICS.** (3) (3-3-3) (Prerequisite: ECSE 334.) Introduction to Radio Frequency Integrated Circuits and wireless transceiver architectures. Modeling of passive/active integrated devices. Design of monolithic bipolar and CMOS LNAs, mixers, filters, broadband amplifiers, RF power amplifiers, VCOs, and frequency synthesizers. Analysis of noise and non-linearity in RFICs. Project using modern RFIC simulation/layout CAD tools.

**ECSE 543 NUMERICAL METHODS IN ELECTRICAL ENGINEERING.** (3) (3-0-6) (Prerequisites: ECSE 322, ECSE 334 and ECSE 352) DC resistor networks and sparse matrix methods. Nonlinear electric and magnetic circuits: curve-fitting; the Newton-Raphson method. Finite elements for electrostatics. Transient analysis of circuits: systems of Ordinary differential equations; stiff equations. Transient analysis of induced currents. Solution of algebraic eigenvalue problems. Scattering of electromagnetic waves: the boundary element method; numerical integration.

**ECSE 545 MICROELECTRONICS TECHNOLOGY.** (3) (3-0-6) (Prerequisite: ECSE 432 or ECSE 533) Basic techniques in the fabrication of microelectronic circuits. Four-point probe, alloyed contacts, diffusion processes, ion implantation epitaxy, silicon dioxide, photolithography, selected diffusion and metallization, transistor fabrication, dry etching, monolithic integrated circuits, isolation, mask making, thin and thick film components, MOS gate voltage and integrated circuits.

**ECSE 547 FINITE ELEMENTS IN ELECTRICAL ENGINEERING.** (3) (3-0-6) (Prerequisites: ECSE 322 and ECSE 352) Finite elements for electrostatics. Energy minimization. Semi-conductors. Nonlinear magnetics and Newton-Raphson. Axisymmetric problems. Capacitance, inductance, and resistance through finite elements. Resonance: cavities, waveguides. High order and curvilinear elements.

□ **ECSE 548 INTRODUCTION TO VLSI SYSTEMS.** (3) (2-2-5) (Prerequisites: ECSE 334 and ECSE 323) (Limited Enrolment - 20) (Password card required) (Lab hours assigned by instructor.) An interdisciplinary course for electrical engineering and computer science students. A structured design methodology for managing the complexity of VLSI system design. Sufficient information on integrated devices, circuits, digital subsystems and system architecture is presented to enable students to span the range of abstractions from device physics to VLSI digital systems.

● **ECSE 549 EXPERT SYSTEMS IN ELECTRICAL DESIGN.** (3) (3-0-6) (Prerequisites: ECSE 323 and ECSE 361)

● **ECSE 559 FLEXIBLE AC TRANSMISSION SYSTEMS.** (3) (3-0-6) (Prerequisite: ECSE 361 and ECSE 334)

**ECSE 563 POWER SYSTEMS OPERATION AND PLANNING.** (3) (3-0-6) (Prerequisite: ECSE 361) Design and operation of large scale power systems: Temporal, spatial and hierarchical decomposition of tasks. Local vs. distributed control. Load-frequency control. Voltage and speed regulation. Interconnected power systems. Power flow. Security states. Optimal operation of power systems. Power system reliability.

**ECSE 565 INTRODUCTION TO POWER ELECTRONICS.** (3) (3-0-6) (Prerequisite: ECSE 334) Semiconductor power switches - thyristors, GTO's, bipolar transistors, MOSFET's. Switch mode power amplifiers. Buck and boost principles. Modulation methods - PWM, delta, hysteresis current control. Rectifiers, inverters, choppers.

**ECSE 571 OPTOELECTRONIC DEVICES.** (3) (3-0-6) (Prerequisites: ECSE 304, ECSE 305, ECSE 352.) (Corequisite: ECSE 533) Physical basis of optoelectronic devices including Light Emitting Diodes, semiconductor optical amplifiers, semiconductor lasers, quantum well devices, and solid state lasers. Quantitative description of detectors, optical modulation, optical logic devices, optical interconnects, and optomechanical hardware. Throughout the course, photonic systems applications will be addressed.

**ECSE 573 MICROWAVE ELECTRONICS.** (3) (3-0-6) (Prerequisite: ECSE 432 or ECSE 533) Physical basis of modern microwave devices and circuits. Microwave transistors and tunnel diodes, transferred electron devices, transit time devices and infra red devices. Microwave generation and amplification, microwave FET circuits. Noise and power amplification.

● **ECSE 578 CRYSTALS AND CONDUCTION.** (3) (3-0-6) (Prerequisite: ECSE 432 or ECSE 533)

**ECSE 596 OPTICAL WAVEGUIDES.** (3) (3-0-6) (Prerequisite: ECSE 352) Introduction to wave and ray optics, ray equation. Kirchhoff-Huygens diffraction theory, Fourier optics, Gaussian beams, propagation characteristics of optical fibers and dielectric waveguides for wideband optical fiber communication systems, waveguide group velocity and dispersion, thin-film waveguides. Discussion of optical fiber communication systems and guided-wave photonic devices.

**ECSE 610 WIRELESS TELECOMMUNICATIONS.** (4) (3-0-9) (Prerequisite: ECSE 511) An introduction to the theory and technology of wireless networks, with the emphasis on networking. Topics include channel modelling, cellularity and frequency reuse, the multiple access problem, services integration, flow control, diversity, smart antennas and aspects of wireless network management. First and second generation systems are described in detail.

**ECSE 615 DIGITAL SIGNAL PROCESSING 2.** (4) (3-0-9) (Prerequisite: ECSE 509 and ECSE 512) Filter banks, multi-rate signal processing, multi-resolution analysis and wavelets, transform coding. Second-order stochastic processes: Wold decomposition, spectral analysis, power spectral estimation and polyspectra, optimum filtering and linear prediction, adaptive filtering, LMS filters, recursive least-square and transform domain techniques.

**ECSE 617 ARRAY SIGNAL PROCESSING.** (4) (3-0-9) (Prerequisite: ECSE 412 or ECSE 512, ECSE 509) Introduction to the mathematical principles of array signal processing and their applications. Conventional beamformer design, optimum array processing structures; detection and direction of arrival estimation, modern subspace methods; adaptive array algorithms; implementation issues (matrix processing, subspace tracking, array calibration); selected applications from wireless communications, audio processing, underwater acoustics.

● **ECSE 620 INFORMATION THEORY AND CODING.** (4) (3-0-9) (Prerequisites: ECSE 411 or ECSE 511, and ECSE 510)

**ECSE 621 STAT. DETECTION AND ESTIMATION.** (4) (3-0-9) (Prerequisites: ECSE 411 or ECSE 511, ECSE 510) On the processing of signals with random components, for applications in pattern recognition, image processing, robotics, telecommunications and control. A framework for statistical decision-making, geometrical representation of optimal strategies, Bayes and minimax rules, hypothesis testing, sequential decision-making, parameter estimation, Wiener and Kalman filtering, tracking, estimation of power spectra.

**ECSE 623 DIGITAL COMMUNICATION 2.** (4) (3-0-9) (Prerequisite: ECSE 510, ECSE 521) Adaptive channel equalization: the LMS algorithm, recursive Least-Squares algorithms, blind equalization. Multipath fading channels: channel characterization and models, diversity techniques for slowly fading channels, detection techniques for frequency selective channels. Spread Spectrum Communications: direct sequence and frequency hopping, multiple access techniques, single and multi-user demodulation techniques. Multicarrier systems.

**ECSE 626 COMPUTER VISION.** (4) (3-0-9) (Prerequisite: ECSE 529) An advanced course on the computational modelling of vis-

ual information processing. Emphasis on human perception and on the mathematical analysis of vision algorithms. Computational and psychophysical projects.

● **ECSE 629 VISUAL MOTOR SYSTEMS.** (4) (3-0-9) (Prerequisite: ECSE 529) Examination of the link between vision and action in artificial and natural systems. Active vision, spatial attention, perception and representation of space, gaze stabilization and tracking, scanning and saccadic eye movements, visual servoing. Design and control of robotic visual-motor systems. Neurobiology of visual-motor systems.

● **ECSE 634 ANALOG INTEGRATED CIRCUITS SIGNAL PROCESSING.** (4) (3-0-9) (Prerequisites: ECSE 334, ECSE 303 or equivalent)

● **ECSE 648 VLSI DESIGN.** (4) (1-5-3) (Prerequisite: ECSE 548)

● **ECSE 649 VLSI TESTING.** (4) (3-0-9) (Prerequisite: B.Eng. or equivalent.)

**ECSE 651 M. ENG. PROJECT 1.** (1) (0-0-3)

**ECSE 652 M.ENG. PROJECT 2.** (2) (0-0-6)

**ECSE 653 M.ENG. PROJECT 3.** (3) (0-0-9)

**ECSE 654 M.ENG. PROJECT 4.** (4) (0-0-12)

**ECSE 655 M.ENG. PROJECT 5.** (5) (0-0-15)

**ECSE 656 M.ENG. PROJECT 6.** (5) (0-0-15)

● **ECSE 675 SOLAR CELLS AND JUNCTIONS.** (4) (3-0-9) (Prerequisite: ECSE 432)

**ECSE 677 EXPERIMENTAL TECHNIQUES: SOLID STATE.** (4) (0-6-6) (Prerequisite: ECSE 545) Experimental project in solid state involving the following: techniques of preparation, fabrication and orientation of samples and structures for experimental study; use of special laboratory apparatus; measurement of electronic, optical and structural properties of samples and structures; evaluation of electronic behaviour and performance; interpretation of relevant physical processes and phenomena.

● **ECSE 678 SPECIAL TOPICS IN SOLIDS 1.** (4) (3-0-9) (Prerequisite: ECSE 432)

● **ECSE 680 TOPICS IN PHOTONICS.** (4) (3-0-9)

● **ECSE 681 COLLOQUIUM IN ELECTRICAL ENGINEERING.** (4)

● **ECSE 682 TOPICS IN COMPUTERS AND CIRCUITS.** (4) (3-0-9)

● **ECSE 683 TOPICS IN VISION AND ROBOTICS.** (4) (3-0-9)

● **ECSE 684 TOPICS: COMPUTER AIDED DESIGN.** (4) (3-0-9)

● **ECSE 685 TOPICS IN POWER ENGINEERING.** (4) (3-0-9)

● **ECSE 686 TOPICS: COMMUNICATIONS SYSTEMS.** (4) (3-0-9)

● **ECSE 688 RECENT ADVANCES IN ELECTRICAL ENGINEERING 1.** (4) (3-0-9)

● **ECSE 689 RECENT ADVANCES: ELECTRICAL ENGINEERING 2.** (4) (3-0-9)

● **ECSE 690 TOPICS: BIOMEDICAL ENGINEERING.** (4) (3-0-9)

**ECSE 691 THESIS RESEARCH 1.** (4) (3-0-9)

**ECSE 692 THESIS RESEARCH 2.** (4) (3-0-9)

**ECSE 693 THESIS RESEARCH 3.** (4) (3-0-9)

**ECSE 694 THESIS RESEARCH 4.** (4) (3-0-9)

**ECSE 695 THESIS RESEARCH 5.** (4) (3-0-9)

**ECSE 696 THESIS RESEARCH 6.** (4) (3-0-9)

**ECSE 697 THESIS RESEARCH 7.** (4) (3-0-9)

**ECSE 701 PH.D. QUALIFYING EXAMINATION.** (0) Oral Examination of Ph.D. student's background in defined areas.

**ECSE 702 PH.D. RESEARCH PLAN PROPOSAL.** (0) Definition of a plan for Ph.D. research.

## 28 English

Department of English  
Arts Building  
853 Sherbrooke Street West  
Montreal, QC H3A 2T6  
Canada

Telephone: (514) 398-6564

Fax: (514) 398-8146

E-mail: [gradstudies.englishlit@mcgill.ca](mailto:gradstudies.englishlit@mcgill.ca)

Web site: [www.arts.mcgill.ca/programs/english/english.html](http://www.arts.mcgill.ca/programs/english/english.html)

Chair — M. Kilgour

### 28.1 Staff

#### *Emeritus Professors*

A. Lucas; M.A.(Queen's), A.M., Ph.D.(Harv.)

M. Puhvel; B.A., M.A.(McG.), Ph.D.(Harv.)

J. Ripley; B.A., M.A.(U.N.B), Ph.D.(Birm.)

D. Suvin; B.A., M.Sc., Ph.D.(Zagreb), F.R.S.C.

W.C. Wees; B.A.(Northwestern), M.A.(Roch.),  
Ph.D.(Northwestern)

#### *Professors*

M.D. Bristol; A.B.(Yale), Ph.D.(Prin.)

M. Dorsinville; B.A., M.A.(Sher.), Ph.D.(C.U.N.Y.)

M.A. Kilgour; B.A.(Tor.), Ph.D.(Yale)

R. Lecker; B.A., M.A., Ph.D.(York)

K. McSweeney; B.A., Ph.D.(Tor.)

P.H. Ohlin; Fil. Mag.(Stockholm), M.A., Ph.D.(New Mexico)

P. Sabor; B.A.(Camb.), M.A.(Queen's), Ph.D.(Lond.)

M. Stenbaek; B.A.(Copenhagen), M.A., Ph.D.(Montr.)

B. Trehearne; B.A., M.A., Ph.D.(McG.)

L.E. Troide; B.A., M.Phil.(Yale), M.A.(Col.) Ph.D.(Yale)

D. Williams; B.A.(Boston), M.A., Ph.D.(Tor.)

P. Yachnin; B.A.(McG.), M.Litt.(Edin.), Ph.D.(Tor.)

#### *Associate Professors*

K. Borris; B.A.(Vic., B.C.), Ph.D.(Edin.)

D.A. Bray; B.A.(McG.), Ph.D.(Edin.)

M.N. Cooke; B.A.(Queen's), M.A.(C'nell), M.A., Ph.D.(Tor.)

P. Gibian; B.A.(Yale), M.A.(N.Y.), Ph.D.(Stan.)

D.C. Hensley; B.A., M.A.(Cantab.), Ph.D.(Yale)

B. Kaite; B.A.(C'dia), M.A.(McM.), Ph.D.(Carl.)

L. Lieblein; B.A.(C.C.N.Y.), A.M., Ph.D.(Roch.)

P. Neilson; B.A.(Bishop's), M.F.A.(Calg.)

T. Ponech; B.A.(McG.), Ph.D.(Northwestern)

D. Salter; B.A.(Br.Col.), M.A., Ph.D.(Tor.)

M.W. Selkirk; B.A.(Alta), M.F.A.(Ill.)

#### *Assistant Professors*

S. Carney; B.A.(Manit.), M.A.(Alta.), Ph.D.(York)

W. Folkerth; B.A.(Calif. State), M.A., Ph.D.(McG.)

A. Hepburn; B.A., M.A.(W.Ont.), Ph.D.(Princeton)

M. Hickman; B.A.(Brown), M.A., Ph.D.(Mich.)

M. Morgan; B.A.(Harv.), Ph.D.(Stan.)

### 28.2 Programs Offered

Master's and Ph.D.

All students who apply will be considered for support which normally takes the form of a Teaching or Research Assistantship.

### 28.3 Admission Requirements

A statement of proposed research, transcripts, writing sample and two letters of recommendation are required of all applicants.

### M.A. Degree

Admission to the M.A. program requires an Honours degree in English or its equivalent. Outstanding applicants from related disciplines may be invited to take a qualifying year.

### Ph.D. Degree

Admission to the doctoral program is highly competitive. Outstanding students with the Master's degree in hand are accepted into Ph.D.2. In rare circumstances, outstanding graduates of B.A. programs will be considered for "fast-tracking" into the doctoral program, entering at Ph.D.1. They follow the M.A. program (Thesis option) and if at the end of the first year their work is evaluated successfully they go on to complete the remaining requirements of the Ph.D. program.

### 28.4 Application Procedures

Applications will be considered upon receipt of:

1. application form;
2. transcripts;
3. two letters of reference;
4. \$60 application fee;
5. a writing sample;
6. statement of proposed research.

All information is to be submitted directly to the Graduate Coordinator.

Applications close January 15.

McGill's on-line application form for graduate program candidates is available at [www.mcgill.ca/applying/graduate](http://www.mcgill.ca/applying/graduate).

### 28.5 Program Requirements

A detailed description of the program requirements, course offerings, and faculty can be found at [www.arts.mcgill.ca/programs/english/english.html](http://www.arts.mcgill.ca/programs/english/english.html).

### M.A. Degree

The Department offers two options towards the M.A. degree, one with a thesis and the other without thesis. Both options consist of 48 credits and are designed to be completed in four terms (of 12 credits each), but it is possible to complete the program in three terms, or one calendar year.

The two programs are similar; the non-thesis option substitutes two seminars and a research paper for the thesis. Both options require participation in a series of sessions on bibliography and research methods.

### Ph.D. Degree

Doctoral students are expected to complete in their first year (Ph.D.2) the two halves of the compulsory proseminar and four other courses, but may substitute for the two second-term courses one extended supervised research project. This course work must be chosen in order to make possible the identification of a major and a minor area of concentration. In Ph.D.3, candidates complete a compulsory research project in the area of the dissertation and submit the dissertation proposal. The language requirement must be fulfilled before the dissertation proposal is approved.

It is the policy of the Department to urge candidates to complete the Ph.D. program within six years. A candidate intending to submit the thesis to meet the deadline for Spring Convocation must give notice of this intention before January 1. A candidate intending to meet the deadline for Fall Convocation must give such notice before May 1.

### 28.6 Courses for Higher Degrees

Students preparing to register should consult the Web at [www.mcgill.ca/minerva](http://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.**

**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.

The following is a list of all courses in English approved for offering at the graduate level. Courses at the 500 level are also open to advanced undergraduates. A maximum of two courses at the 500 level may be taken by Masters students.

**ENGL 500 MIDDLE ENGLISH.** (3) Topic for 2003-04: Women and Body in the Middle Ages.

**ENGL 501 16TH CENTURY.** (3)

**ENGL 502 17TH CENTURY.** (3)

**ENGL 503 18TH CENTURY.** (3)

**ENGL 504 19TH CENTURY.** (3) Topic for 2003-04: Critical Approaches to Romantic Poetry.

**ENGL 505 20TH CENTURY.** (3) Topic for 2003-04: Narrative and Seduction.

**ENGL 516 SHAKESPEARE.** (3) Topic for 2003-04: Shakespearience.

**ENGL 525 AMERICAN LITERATURE.** (3)

**ENGL 527 CANADIAN LITERATURE.** (3) Topic for 2003-04: Ondaatje.

**ENGL 529D1 INTERDISCIPLINARY SEMINAR - NORTH AMERICAN STUDIES.** (1.5)

**ENGL 529D2 INTERDISCIPLINARY SEMINAR - NORTH AMERICAN STUDIES.** (1.5)

- **ENGL 530 LITERARY FORMS.** (3)

- **ENGL 531 LITERARY FORMS.** (3)

**ENGL 533 LITERARY MOVEMENTS.** (3) Topic for 2003-04: Postcolonial Fiction.

**ENGL 540 LITERARY THEORY 1.** (3) (Topic for 2003-04: Feminist Textuality)

- **ENGL 545 TOPICS IN LITERATURE & SOCIETY.** (3)

- **ENGL 553 OLD ENGLISH LITERATURE.** (3)

- **ENGL 565 MEDIEVAL DRAMA WORKSHOP.** (3)

**ENGL 566 SPECIAL STUDIES IN DRAMA 1.** (3)

- **ENGL 568 TOPICS IN THE DRAMATIC FORM.** (3)

● **ENGL 569 THEORIES OF REPRESENTATION.** (3) (Prerequisites: ENGL 458, ENGL 459 and/or permission of instructor) This course will involve intensive work in theoretical approaches to acting, directing, reception, performance, space, dramaturgy, and mise-en-scène.

**ENGL 585 MODES OF COMMUNICATION 1.** (3)

- **ENGL 586 MODES OF COMMUNICATION 2.** (3)

- **ENGL 587 THEORETICAL ISSUES: STUDY COMMUNICATIONS AND CULTURE.** (3)

**ENGL 608 CHAUCER 1.** (3)

- **ENGL 609 CHAUCER 2.** (3)

- **ENGL 616 ELIZABETHAN AND JACOBEAN DRAMA.** (3)

**ENGL 640 THE AMERICAN NOVEL.** (3)

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- **ENGL 790 DOCTORAL LANGUAGE EXAMINATION.** (0)

- **ENGL 790D1 DOCTORAL LANGUAGE EXAMINATION.** (0)

- **ENGL 790D2 DOCTORAL LANGUAGE EXAMINATION.** (0)

- **ENGL 791 DOCTORAL COMPREHENSIVE EXAMINATION PART 1.** (6)

- **ENGL 791D1 DOCTORAL COMPREHENSIVE EXAMINATION PART 1.** (3)

- **ENGL 791D2 DOCTORAL COMPREHENSIVE EXAMINATION PART 1.** (3)

- **ENGL 792 DOCTORAL COMPREHENSIVE EXAMINATION PART 2.** (6)

- **ENGL 792D1 DOCTORAL COMPREHENSIVE EXAMINATION PART 2.** (3)

- **ENGL 792D2 DOCTORAL COMPREHENSIVE EXAMINATION PART 2.** (3)

- **ENGL 793 DOCTORAL COMPREHENSIVE EXAMINATION PART 3.** (6)

- **ENGL 793D1 DOCTORAL COMPREHENSIVE EXAMINATION PART 3.** (3)

- **ENGL 793D2 DOCTORAL COMPREHENSIVE EXAMINATION PART 3.** (3)

**ENGL 796 RESEARCH PROJECT.** (6) (Restricted to Ph.D Candidates)

**ENGL 797 COMPULSORY RESEARCH PROJECT.** (6) (Restricted to Ph.D Candidates)

**ENGL 798 DISSERTATION PROPOSAL.** (3) (Restricted to Ph.D Candidates)