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**Note: Throughout this publication, "you" refers to students newly admitted, readmitted or returning to McGill.**

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**Note:** For inquiries regarding specific graduate programs, please contact the appropriate department.

## 2.3 General Statement Concerning Higher Degrees

Graduate and Postdoctoral Studies (GPS) oversees all programs leading to graduate diplomas, certificates, and higher degrees, with the exception of some programs in the School of Continuing Studies. It is responsible for admission policies, the supervision of graduate students' work, and for recommending to Senate those who may receive the degrees, diplomas, and certificates.

## 3 Important Dates 2012–2013

For all dates relating to the academic year, consult [www.mcgill.ca/importantdates](http://www.mcgill.ca/importantdates).

## 4 Graduate Studies at a Glance

### 4.1 Graduate and Postdoctoral Degrees Offered by Faculty

McGill University offers graduate and postdoctoral programs in the following units (organized by their administering home faculty):

Faculty of Agricultural and Environmental Sciences	Degrees Available
: <i>Agricultural Economics</i>	M.Sc.
: <i>Animal Science</i>	M.Sc., M.Sc.A., Ph.D.
: <i>Bioresource Engineering</i>	M.Sc., M.Sc.A., Ph.D., Graduate Certificate
: <i>Biotechnology</i>	M.Sc.A., Graduate Certificate
: <i>Dietetics and Human Nutrition</i>	M.Sc., M.Sc.A., Ph.D., Graduate Diploma
: <i>Food Science and Agricultural Chemistry</i>	M.Sc., Ph.D.
: <i>Natural Resource Sciences</i>	M.Sc., Ph.D.
: <i>Parasitology</i>	M.Sc., Ph.D.
: <i>Plant Science</i>	M.Sc., M.Sc.A., Ph.D., Graduate Certificate
Faculty of Arts	Degrees Available
: <i>Anthropology</i>	M.A., Ph.D.
: <i>Art History</i>	M.A., Ph.D.
Classics – see : <i>History and Classical Studies</i>	N/A
: <i>Communication Studies</i>	M.A., Ph.D.
: <i>East Asian Studies</i>	M.A., Ph.D.
: <i>Economics</i>	M.A., Ph.D.
: <i>English</i>	M.A., Ph.D.
: <i>French Language and Literature</i>	M.A., Ph.D.
section 11.6: <i>Geography</i>	M.A., Ph.D.
: <i>History and Classical Studies</i>	M.A., Ph.D.
: <i>Institute for the Study of International Development</i>	N/A
: <i>Islamic Studies</i>	M.A., Ph.D.

Faculty of Arts	Degrees Available
: <i>Jewish Studies</i>	M.A.
: <i>Languages, Literatures, and Cultures</i>	M.A., Ph.D.
: <i>Linguistics</i>	M.A., Ph.D.
section 11.7: <i>Mathematics and Statistics</i>	M.A., Ph.D.
: <i>Philosophy</i>	M.A., Ph.D.
: <i>Political Science</i>	M.A., Ph.D.
section 11.9: <i>Psychology</i>	M.A., Ph.D.
: <i>Quebec Studies / Études sur le Québec</i>	N/A
: <i>Social Studies of Medicine</i>	N/A
: <i>Social Work</i>	M.S.W., Ph.D.
: <i>Sociology</i>	M.A., Ph.D.

School of Dentistry	Degrees Available
: <i>Dentistry</i>	M.Sc.

Desautels Faculty of Management	Degrees Available
: <i>Desautels Faculty of Management</i>	M.B.A., M.B.A. with Integrated B.C.L./LL.B., M.D./M.B.A., M.B.A./Japan, E.M.B.A., M.M.M., M.M., Ph.D., Graduate Certificate, Diploma

Faculty of Education	Degrees Available
: <i>Faculty of Education</i>	B.A., B.Ed., M.Ed., Ph.D., Graduate Certificate, Diploma

<b>Faculty of Medicine</b>	<b>Degrees Available</b>
: <i>Communication Sciences and Disorders</i>	M.Sc., M.Sc.A., Ph.D.
: <i>Epidemiology and Biostatistics</i>	M.Sc., Ph.D., Graduate Diploma
: <i>Human Genetics</i>	M.Sc., Ph.D.
: <i>Medical Physics</i>	M.Sc.
: <i>Medicine, Experimental</i>	M.Sc., Ph.D., Graduate Diploma
: <i>Medicine, Family (Option)</i>	N/A
: <i>Microbiology and Immunology</i>	M.Sc., Ph.D.
: <i>Neuroscience (Integrated Program in)</i>	M.Sc., Ph.D.
: <i>Occupational Health</i>	M.Sc.A., Ph.D.
: <i>Otolaryngology – Head and Neck Surgery</i>	M.Sc.
: <i>Pathology</i>	M.Sc., Ph.D.
: <i>Pharmacology and Therapeutics</i>	M.Sc., Ph.D.
: <i>Physiology</i>	M.Sc., Ph.D.
: <i>Psychiatry</i>	M.Sc.
: <i>Surgery, Experimental (Division of Surgical Research)</i>	M.Sc., Ph.D., Graduate Diploma
<b>School of Nursing</b>	<b>Degrees Available</b>
: <i>Nursing</i>	M.Sc.A., Ph.D., Graduate Certificate, Graduate Diploma
<b>School of Physical and Occupational Therapy</b>	<b>Degrees Available</b>
: <i>Physical and Occupational Therapy</i>	M.Sc., M.Sc.A., Ph.D., Graduate Certificate
<b>Faculty of Religious Studies</b>	<b>Degrees Available</b>
: <i>Religious Studies</i>	M.A., S.T.M., Ph.D.
<b>Schulich School of Music</b>	<b>Degrees Available</b>
: <i>Schulich School of Music</i>	M.A., M.Mus., D.Mus., Ph.D., Graduate Diploma
<b>Faculty of Science</b>	<b>Degrees Available</b>
<i>section 11.1: Atmospheric and Oceanic Sciences</i>	M.Sc., Ph.D.
<i>section 11.2: Biology</i>	M.Sc., Ph.D.
<i>section 11.3: Chemistry</i>	M.Sc., M.Sc.A., Ph.D.
<i>section 11.4: Computer Science</i>	M.Sc., Ph.D.
<i>section 11.5: Earth and Planetary Sciences</i>	M.Sc., Ph.D.
<i>section 11.6: Geography</i>	M.Sc., Ph.D.
<i>section 11.7: Mathematics and Statistics</i>	M.Sc., Ph.D.
<i>section 11.8: Physics</i>	M.Sc., Ph.D.
<i>section 11.9: Psychology</i>	M.Sc., Ph.D.

## 4.2 Master's Degrees and Prerequisites

The following list shows all of the master's degrees available at McGill, along with their prerequisites. See [section 4.3: Master's Degree Programs and Specializations](#) for more information on specific programs and options.

Degree		Prerequisites
Master of Arts	M.A.	Bachelor of Arts in the subject selected for graduate work. See appropriate unit.
Master of Architecture	M.Arch.	Professional degree – McGill B.Sc.(Arch.) degree, or equivalent. Post-professional degree – an M.Arch. (professional degree) or equivalent professional degree.
Master of Business Administration	M.B.A.	An undergraduate degree from an approved university. See : <a href="#">M.B.A. Program</a> .
Master of Business Administration with integrated Bachelor of Civil Law / Bachelor of Laws	M.B.A. with B.C.L./LL.B.	See : <a href="#">M.B.A. Program</a> .
Master of Business Administration with Doctor of Medicine / Master of Surgery	M.B.A. with M.D.,C.M.	See : <a href="#">M.B.A. Program</a> .  Bachelor's degree with specialization related to the subject chosen for graduate work, plus a Permanent Quebec Teaching Diploma or its equivalent for some of the abo

Program	Thesis/Non-Thesis	Options
Professional	Non-Thesis	Design Studio, Design Studio – Directed Research
Post-professional	Non-Thesis	Architectural History and Theory, Cultural Mediations and Technology, Urban Design and Housing

**Master of Arts (M.A.)**

Programs leading to the degree of Master of Arts are offered in the following areas:

Program Areas	Thesis/Non-Thesis	Options
Anthropology	Thesis, Non-Thesis	Development Studies, Environment, Gender and Women's Studies (Thesis)
Art History	Non-Thesis	Gender and Women's Studies (Non-Thesis)
Classics	Thesis, Non-Thesis	N/A
Communication Studies	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Counselling Psychology	Non-Thesis (Professional Internship), Non-Thesis (Project)	N/A
East Asian Studies	Thesis ( <i>Ad Hoc</i> )	N/A
Economics	Thesis, Non-Thesis	Development Studies, Social Statistics (Non-Thesis)
Educational Psychology	Thesis	N/A
Education and Society	Thesis, Non-Thesis	Gender and Women's Studies (Thesis) Gender and Women's Studies, Jewish Education (Non-Thesis)
Educational Leadership	Thesis, Non-Thesis (Coursework), Non-Thesis (Project)	Gender and Women's Studies (Thesis) Gender and Women's Studies (Non-Thesis (Project))
English	Thesis, Non-Thesis	N/A
French	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Geography	Thesis	Development Studies, Environment, Gender and Women's Studies, Neotropical Environment, Social Statistics (Thesis)
German	Thesis, Non-Thesis	N/A
Hispanic Studies	Thesis, Non-Thesis	N/A
History	Thesis, Non-Thesis	Development Studies, European Studies, Gender and Women's Studies (Thesis) Development Studies, European Studies, Gender and Women's Studies (Non-Thesis)
History of Medicine	Non-Thesis	N/A
Islamic Studies	Thesis	Gender and Women's Studies (Thesis)
Italian	Thesis, Non-Thesis	N/A
Jewish Studies	Thesis, Non-Thesis	N/A
Kinesiology and Physical Education	Thesis, Non-Thesis	N/A
Linguistics	Non-Thesis	N/A
Mathematics and Statistics	Thesis, Non-Thesis	N/A
Medical Anthropology	Thesis	N/A
Music – Music Education	Thesis, Non-Thesis	N/A
Music – Music Technology	Thesis, Non-Thesis	N/A
Music – Musicology	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Music – Theory	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Philosophy	Thesis	Bioethics



Program Areas	Thesis/Non-Thesis	Options
Political Science	Thesis, Non-Thesis	Development Studies, European Studies (Thesis) Development Studies, European Studies, Gender and Women's Studies, Social Statistics (Non-Thesis)
Psychology	Thesis	N/A
Religious Studies	Thesis, Non-Thesis	Bioethics, Gender and Women's Studies (Thesis)
Russian	Thesis	N/A
Second Language Education	Thesis, Non-Thesis	Gender and Women's Studies (Thesis)
Sociology	Thesis, Non-Thesis	Development Studies, Environment, Gender and Women's Studies, Medical Sociology, Neotropical Environment (Thesis) Development Studies, Gender and Women's Studies, Medical Sociology, Social Statistics (Non-Thesis)
Teaching and Learning	Non-Thesis	English or French Second Language, English Language Arts, Mathematics, Science and Technology, Social Sciences

#### Master of Business Administration and Management Degrees (M.B.A., M.M., M.M.M.)

A program leading to the degree of Master of Business Administration (M.B.A.) is offered in the following concentrations:

Program	Thesis/Non-Thesis	Options
M.B.A.	Non-Thesis	Finance, General Management, Global Strategy and Leadership, Marketing, Technology and Innovation (Non-Thesis)
M.B.A. with B.C.L. and LL.B.	Non-Thesis	Finance, General Management, Global Strategy and Leadership, Marketing, Technology and Innovation (Non-Thesis)
M.D./M.B.A.	Non-Thesis	N/A
M.B.A./Japan	Non-Thesis	Finance, General Management, Global Strategy and Leadership, Marketing, Technology and Innovation (Non-Thesis)
E.M.B.A.	Non-Thesis	N/A
M.M.M.	Non-Thesis	N/A
M.M./IMPM	Non-Thesis	N/A
M.M./IMPMHL	Non-Thesis	N/A

#### Master of Education (M.Ed.)

Program	Thesis/Non-Thesis	Options
Educational Psychology	Non-Thesis	N/A

#### Master of Engineering (M.Eng.)

Program	Thesis/Non-Thesis	Options
Aerospace Engineering	Non-Thesis	N/A
Biomedical Engineering	Thesis, Non-Thesis	Bioinformatics (Thesis)
Chemical Engineering	Non-Thesis	Environmental Engineering (Non-Thesis)
Civil Engineering	Thesis, Non-Thesis	Environmental Engineering (Non-Thesis)
Electrical Engineering	Thesis, Non-Thesis	Computational Science and Engineering (Thesis)
Mechanical Engineering	Thesis, Non-Thesis	Computational Science and Engineering (Thesis)
Mining and Materials Engineering	Thesis, Non-Thesis	Environmental Engineering (Non-Thesis)

#### Master of Laws (LL.M.)

**Program**

**Thesis/Non-Thesis**

**Options**

Program Areas	Thesis/Non-Thesis	Options
Food Science and Agricultural Chemistry	Thesis, Non-Thesis	Food Safety (Non-Thesis)
Genetic Counselling	Non-Thesis	N/A
Geography	Thesis	Environment, Neotropical Environment
Human Genetics	Thesis	Bioethics, Bioinformatics
Human Nutrition	Thesis	N/A
Kinesiology and Physical Education	Thesis, Non-Thesis	N/A
Mathematics and Statistics	Thesis, Non-Thesis	Bioinformatics, Computational Science and Engineering
Mechanical Engineering	Thesis	N/A
Medical Radiation Physics	Thesis	N/A
Microbiology	Thesis	Environment
Microbiology and Immunology	Thesis	N/A
Mining and Materials Engineering	Thesis	N/A
Neuroscience	Thesis	N/A
Otolaryngology	Thesis	N/A
Parasitology	Thesis	Bioinformatics, Environment
Pathology	Thesis	N/A
Pharmacology	Thesis	Chemical Biology
Physics	Thesis	N/A
Physiology	Thesis	Bioinformatics
Plant Science	Thesis	Bioinformatics, Environment, Neotropical Environment
Psychiatry	Thesis	N/A
Psychology	Thesis	N/A
Public Health	Non-Thesis	Environment
Rehabilitation Sciences	Thesis, Non-Thesis	N/A
Renewable Resources	Thesis, Non-Thesis	Environment, Neotropical Environment (Thesis) Environmental Assessment (Non-Thesis)

### Master of Science, Applied (M.Sc.A.)

This degree was designed to provide postgraduate training of a professional and vocational character, with less emphasis on theoretical knowledge and research than in Master of Science programs, but with no lower standards either for admission or completion of requirements. Two years of full-time study or equivalent are normally required with an emphasis on coursework.

Program	Thesis/Non-Thesis	Options
Animal Science	Non-Thesis	N/A
Bioresource Engineering	Non-Thesis	Environment, Environmental Engineering, Neotropical Environment
Biotechnology	Non-Thesis	N/A
Chemistry	Non-Thesis	N/A
Communication Sciences and Disorders	Non-Thesis	Speech-Language Pathology
Human Nutrition	Non-Thesis (Project), Non-Thesis (Practicum)	N/A
Nursing	Non-Thesis	N/A
Occupational Health	Non-Thesis (Resident), Non-Thesis (Distance)	N/A

Program	Thesis/Non-Thesis	Options
Occupational Therapy	Non-Thesis	N/A
Physical Therapy	Non-Thesis	N/A
Plant Science	Non-Thesis	N/A

#### Master of Social Work (M.S.W.)

The M.S.W. degree represents a second level of professional study in which students build competence in a chosen field of practice.

Program	Thesis/Non-Thesis	Options
Social Work	Thesis, Non-Thesis	N/A
Joint Master of Social Work with B.C.L. and LL.B.	Non-Thesis	N/A

#### Master of Urban Planning

The program requires a minimum of two years residence and a three-month internship with a member of a recognized planning association.

Program	Thesis/Non-Thesis	Options
Urban Planning	Thesis, Non-Thesis	Transportation Planning, Urban Design (Non-Thesis)

## 4.4 Doctoral Degrees

The following section lists the doctoral degrees available at McGill, along with their prerequisites. See [section 4.4.1: Doctoral Degree Programs and Specializations](#) for specific programs and options for doctoral degrees.

Degree		Prerequisites
Doctor of Civil Law	D.C.L.	B.C.L. or LL.B. and usually LL.M. See Law.
Doctor of Music	D.Mus.	M.A. in Composition (D.Mus. in Composition) or a master's degree in Performance, and professional and teaching experience (D.Mus. in Performance). See Music.
	Ph.D. or of Music	An undergraduate degree relevant to the subject chosen for graduate work. Some departments require all Ph.D. candidates to hold a master's degree in the same

Programs leading to the degree of Doctor of Philosophy are offered in the following areas:

<b>Program</b>	<b>Options</b>	<b>Offered by Faculty/School</b>
Animal Science	Bioinformatics	Faculty of Agricultural and Environmental Sciences
Anthropology	Neotropical Environment	Faculty of Arts
Architecture	N/A	Faculty of Engineering
Art History	Gender and Women's Studies	Faculty of Arts
Atmospheric and Oceanic Sciences	N/A	Faculty of Science
Biochemistry	Bioinformatics, Chemical Biology	Faculty of Medicine
Biology	Bioinformatics, Developmental Biology, Environment, Neotropical Environment	Faculty of Science
Biomedical Engineering	Bioinformatics	Faculty of Medicine
Bioresource Engineering	Environment, Neotropical Environment	Faculty of Agricultural and Environmental Sciences
Biostatistics	N/A	Faculty of Medicine
Cell Biology	N/A	Faculty of Medicine
Chemical Engineering	N/A	Faculty of Engineering
Chemistry	Chemical Biology	Faculty of Science
Civil Engineering	N/A	Faculty of Engineering
Classics	N/A	Faculty of Arts
Communication Sciences and Disorders	Language Acquisition	Faculty of Medicine
Communication Studies	Gender and Women's Studies	Faculty of Arts
Computer Science	Bioinformatics	Faculty of Science
Counselling Psychology	N/A	Faculty of Education
Earth and Planetary Sciences	Environment	Faculty of Science
Economics	N/A	Faculty of Arts
Educational Psychology	N/A	Faculty of Education
Educational Studies	Gender and Women's Studies, Language Acquisition	Faculty of Education
Electrical Engineering	N/A	Faculty of Engineering
English	N/A	Faculty of Arts
Entomology	Environment, Neotropical Environment	Faculty of Agricultural and Environmental Sciences
Epidemiology	N/A	Faculty of Medicine
Experimental Medicine	Environment	Faculty of Medicine
Experimental Surgery (Surgical Research)	N/A	Faculty of Medicine
Food Science and Agricultural Chemistry	N/A	Faculty of Agricultural and Environmental Sciences
French Language and Literature	Gender and Women's Studies	Faculty of Arts
Geography	Environment, Gender and Women's Studies, Neotropical Environment	Faculty of Arts, Faculty of Science
German	N/A	Faculty of Arts
Hispanic Studies	N/A	Faculty of Arts
History	N/A	Faculty of Arts
Human Genetics	Bioinformatics	Faculty of Medicine
Human Nutrition	N/A	Faculty of Agricultural and Environmental Sciences
Information Studies	N/A	Faculty of Education

<b>Program</b>	<b>Options</b>	<b>Offered by Faculty/School</b>
Islamic Studies	Gender and Women's Studies	Faculty of Arts
Linguistics	Language Acquisition	Faculty of Arts
Management	N/A	Desautels Faculty of Management
Mathematics and Statistics	Bioinformatics	Faculty of Arts, Faculty of Science
Mechanical Engineering	N/A	Faculty of Engineering
Microbiology	N/A	Faculty of Agricultural and Environmental Sciences
Microbiology and Immunology	Bioinformatics, Environment	Faculty of Medicine
Mining and Materials Engineering	N/A	Faculty of Engineering
Music	(Composition, Music Education, Musicology, Music Technology, Sound Recording, Theory), Gender and Women's Studies	Schulich School of Music
Neuroscience	N/A	Faculty of Medicine
Nursing	Psychosocial Oncology	School of Nursing
Occupational Health	N/A	Faculty of Medicine
Parasitology	Bioinformatics, Environment	Faculty of Agricultural and Environmental Sciences
Pathology	N/A	Faculty of Medicine
Pharmacology	Chemical Biology	Faculty of Medicine
	Environment, Gender and ology	Faculty of Arts

Program	Options	Offered by Faculty/School
Psychiatry	N/A	Faculty of Medicine
Urban Planning	N/A	Faculty of Engineering

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#### 4.5 Postdoctoral Research

See [section 8: Postdoctoral Research](#) for information about postdoctoral research at McGill University.

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#### 4.6 Graduate Diplomas and Graduate Certificates

The graduate diplomas and graduate certificates listed below are programs of study under the academic supervision of Graduate and Postdoctoral Studies. The prerequisite for a diploma or certificate is an undergraduate degree in the same discipline.

- The following master's programs have a minimum residence requirement of **three full-time terms**: M.Arch, M.A., M.Eng., LL.M., M.Mus. (**except** M.Mus. in Sound Recording), M.Sc., M.S.W., M.Sc.A. (**except** M.Sc.A. in Communication Sciences and Disorders).
- The following master's programs have a **minimum** residence requirement of **four full-time terms**: M.L.I.S.; M.Mus. in Sound Recording; M.U.P.; M.A. (60 credits – Counselling Psychology – thesis; 78 credits – Educational Psychology); M.A. Teaching and Learning – Non-Thesis; M.Sc.A. in Communication Sciences and Disorders; S.T.M., Religious Studies.
- The residence requirement for the master's program in Education (M.Ed.); Library and Information Studies (M.L.I.S.); Management (M.B.A.); Religious Studies (S.T.M.); M.A. Counselling Psychology – Non-Thesis; M.A. Teaching and Learning – Non-Thesis; M.Sc. in Public Health – Non-Thesis; M.Sc.A. Nursing; M.Sc.A. Occupational Therapy; M.Sc.A. Physical Therapy; and students in part-time programs is determined on a per course basis. Residence requirements are fulfilled when students complete all course requirements in their respective programs.
- For master's programs structured as Course, Project or Non-Thesis options where the program is pursued on a part-time basis, residence requirements are normally fulfilled when students complete all course requirements in their respective programs (minimum 45 credits or a minimum of three full-time terms) and pay the fees accordingly.

These designated periods of residence represent minimum time requirements. There is no guarantee that the work for the degree can be completed in this time. Students must register for such additional terms as are needed to complete the program.

### Coursework – Master's Degrees

Program requirements are outlined in the relevant departmental sections of the Graduate and Postdoctoral Studies *Programs, Courses and University Regulations* publication, available at [www.mcgill.ca/study](http://www.mcgill.ca/study).

The department concerned will examine the student's previous training and then decide which of the available courses in the area of specialization or related fields are required to bring the candidate to the proper level for the master's degree. Due account will be taken of relevant courses passed at any recognized university.

As a rule, no more than one-third of the McGill program formal coursework (not thesis, project, stage, or internship) can be credited with courses from another university. gree can be completed in thie tim, bo

Non-thesis degrees normally specify the course program which the candidate must follow.

The candidate is required to pass, with a grade of B- or better, all those courses that have been designated by the department as forming a part of the program, including additional requirements.

Students taking courses at another university must obtain a minimum grade of B- (65%) if the course is to be credited toward their McGill degree. In the cases where only a letter grade is used, a B- is the minimum passing grade and no equivalent percentage will be considered. In the cases where only a percentage grade is used, 65% is the minimum passing grade.

If courses were not used for a degree, they could be **credited** toward a McGill degree, keeping in mind that a maximum of one-third of the coursework (not thesis, project, stage, internship, and practicum) can be credited. If an **exemption** is granted, it must be replaced by another graduate course at McGill toward the degree. No double counting is ever allowed. This regulation also applies to doctoral programs.

### Research and Thesis – Master's Degrees

All candidates for a research degree must present a thesis based on their own research. The total number of credits allotted to the thesis in any master's program must not be less than 24. The title of the thesis and names of examiners must be forwarded on a *Nomination of Examiners* form, in accordance with the dates on [www.mcgill.ca/importantdates](http://www.mcgill.ca/importantdates), through the chair of the department concerned at the same time as the thesis is submitted to Graduate and





**Note:** The master's degree must have been awarded before initial registration in the doctoral program; otherwise, the admission level will be at Ph.D. 1 and residency will be extended to three years. Once the level of admission is approved, it will not be changed after obtaining the master's degree if the date falls after registration in the program. If a previous awarded degree is a condition of admission, it must be fulfilled before registration in another program.

As a rule, no more than one-third of the McGill program formal coursework can be credited with courses from another university.

#### **Comprehensive Examinations – Doctoral**

A comprehensive examination or its equivalent is usually held near the end of Ph.D. 2. The results of this examination determine whether or not students will be permitted to continue in their programs. The methods adopted for examination and evaluation and the areas to be examined are specified by departmental regulations approved by the Dean of Graduate and Postdoctoral Studies. It is the responsibility of students to inform themselves of these details at the commencement of their programs. For more information, see *Programs, Courses and University Regulations > University Regulations and Resources > Graduate > Guidelines and Policies > : Ph.D. Comprehensives Policy*.

#### **Language Requirements – Doctoral**

Most graduate departments in the Faculties of Agricultural and Environmental Sciences, Education, Engineering, Management, Medicine, and Science do not require a language examination. Students should inquire in their departments if there are any such requirements or whether any other requirements have



## 6.3 Admission Tests

### Graduate Record Examination (GRE)

The Graduate Record Examination (GRE) (Educational Testing Service, Princeton, NJ 08540) consists of a relatively advanced test in the candidates' specialty, and a general test of their attainments in several basic fields of knowledge for which no special preparation is required or recommended. It is offered at many centres, including Montreal, several times a year; the entire examination takes about eight hours, and there is a registration fee. Refer to [www.ets.org/gre](http://www.ets.org/gre) for further information. Only some departments require applicants to write the GRE examination, but all applicants who have written either the general aptitude or the advanced test are advised to submit the scores along with their other admission material.

This credential is of special importance in the case of applicants whose education has been interrupted, or has not led directly toward graduate study in the subject selected. In such cases the department has the right to insist on a report from the Graduate Record Examination or some similar test. High Standing in this examination will not by itself guarantee admission. The Miller Analogies Test may be used similarly. Some departments of the Faculty of Education also require the taking of various tests.

### Graduate Management Admissions Test (GMAT)

Applicants to graduate programs in Management must submit scores from the Graduate Management Admissions Test (GMAT). The test is a standardized assessment offered by the Graduate Management Admission Council to help business schools assess candidates for admission. For further information, see [www.mba.com/the-gmat](http://www.mba.com/the-gmat).

## 6.4 Competency in English

Applicants to graduate studies must demonstrate an adequate level of proficiency in English **prior to admission**, regardless of citizenship status or country of origin.

Normally, applicants meeting any one of the following conditions are NOT required to submit proof of proficiency in English:

1. Mother tongue (language first learned and still used on a daily basis) is English.
2. Has obtained (or is about to obtain) an undergraduate or graduate degree from a recognized foreign institution where English is the language of instruction.
3. Has obtained (or is about to obtain) an undergraduate or graduate degree from a recognized institution in Canada or the United States of America (anglophone or francophone).
4. Has lived and attended university, or been employed, for at least four consecutive years, in a country where English is the acknowledged primary language.

Applicants who do not meet any of the above-listed conditions must demonstrate proficiency in English using **one** of the following options:

1. TOEFL (Test of English as a Foreign Language): minimum acceptable scores are:

#### Competency in English

iBT (Internet-based test)	PBT (paper-based test)	CBT (computer-based test)*
86 overall (no less than 20 in each of the four component scores)	550	* The CBT is no longer being offered and CBT results are no longer considered valid, or being reported by ETS.

N.B. an institutional version of the TOEFL is not acceptable.

2. IELTS (International English Language Testing System): a band score of 6.5 or greater.
3. MELAB (Michigan English Language Assessment Battery): a grade of 85% or higher.
4. University of Cambridge ESOL Certificate in Advanced English (CAE): a grade of "B" (Good) or higher.
5. University of Cambridge ESOL Certificate of Proficiency in English (CPE): a grade of "C" (Pass) or higher.
6. Edexcel London Test of English – Level 5 – with an overall grade of at least "Pass."
7. McGill Certificate of Proficiency in English or McGill Certificate of Proficiency – English for Professional Communication: Certificate of Proficiency awarded. McGill Certificate of Proficiency in English or McGill Certificate of Proficiency – English for Professional Communication: Certificate of Proficiency awarded.

In each case, applicants must ensure that official test results are sent to McGill directly by the testing service. Applications cannot be considered if test results are not available. These scores are general minima; some departments may set higher requirements.

*Revised – July 2008*

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## **6.10 Deferral of Admission**

Under exceptional circumstances, an admission for a particular semester can be considered for a deferral. This can be considered only if the student has not registered. If the student has already registered, no deferral can be granted. The student must withdraw from the University and apply for admission to a later term.

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## **7 Fellowships, Awards, and Assistantships**

Graduate and Postdoctoral Studies  
(Fellowships and Awards Section)  
James Administration Building, Room 400  
845 Sherbrooke Street W

Postdocs of policies, procedures, and pri

- i. Postdocs are subject to the responsibilities outlined in the *Handbook on Student Rights and Responsibilities* (“Green Book”), available at [www.mcgill.ca/secretariat/policies/students](http://www.mcgill.ca/secretariat/policies/students).
- ii. Each academic unit hosting Postdocs should clearly identify Postdocs’ needs and the means by which they will be met by the unit.
- iii. Each academic unit should assess the availability of research supervision facilities, office space, and research funding before recruiting Postdocs.
- iv. Some examples of responsibilities of the department are:
  - to verify the Postdoc’s eligibility period for registration;
  - to provide Postdocs with departmental policy and procedures that pertain to them;
  - to oversee the registration and appointment of Postdocs;
  - to assign departmental personnel (e.g., Postdoc coordinator and Graduate Program Director) the responsibility for Postdocs;
  - to oversee and sign off on the Letter of





- Guideline on Hours of Work

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## 10 Information on Research Policies and Guidelines, Patents, Postdocs, Associates, Trainees

Refer to *Programs, Courses and University Regulations > University Regulations and Resources > Graduate > : Research Policy and Guidelines, Patents, Postdocs, Associates, Trainees* for information on the following:

- Policy on Research Ethics
- Regulations on Research Policy
- Policy on Research Integrity
- Guidelines for Research Involving Human Subjects
- Guidelines for Research with Animal Subjects
- Policy on Intellectual Property
- Regulations Governing Conflicts of Interest
- Safety in Field Work
- Office of Sponsored Research
- Postdocs
- Research Associates

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## 11 Academic Programs

The programs and courses in the following sections have been approved for the 2012–

at Environment Canada. In some cases, M.Sc. and Ph.D. research may include a field component. Most students also participate in national and international conferences.

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

**section 11.1.5: Master of Science (M.Sc.); Atmospheric and Oceanic Sciences (Thesis) (45 credits)**

Our program applies mathematics, physics, computing, and sometimes chemistry to study the atmosphere and/or oceans. The ideal student would therefore have a strong quantitative background in one or more of these fields. Although some of our students have undergraduate knowledge of meteorology or physical oceanography, such background is not necessary to succeed in the program. McGill offers the only program in Canada that includes both atmospheric and oceanic sciences. Students benefit from a large professor-to-student ratio, access to state-of-the-art computing, remote sensing, and atmospheric chemistry laboratory equipment. The Department also has close ties with Environment Canada's numerical weather prediction centre in Dorval, Quebec. Most of our incoming M.Sc. students choose this (default) option. It allows considerable flexibility as to the choice of research topics, and gives students both a strong classroom knowledge of the subject as well as the opportunity to choose from a variety of thesis research projects. Students who do not choose to continue in academia find employment in a variety of areas and places; for example, working with Environment Canada as research associates or weather forecasters.

**section 11.1.6: Master of Science (M.Sc.); Atmospheric and Oceanic Sciences (Thesis) — Environment (45 credits)**

The graduate option in Environment provides students with an appreciation for the role of science in informing decision-making in the environment sector, including the influence of political, socio-economic, and ethical judgments. The option also provides a forum whereby graduate students bring their disciplinary perspectives together and enrich each other's learning through structured courses, formal seminars, and informal discussions and networking. Students following the Environment option must first be accepted by the Department of Atmospheric and Oceanic Sciences, and then by the McGill School of Environment (MSE) before an offer of admission will be made by the University. Environment option students require either a single supervisor with a joint appointment in Atmospheric and Oceanic Sciences and the MSE, or co-supervisors, one each in Atmospheric and Oceanic Sciences and the MSE.

**section 11.1.7: Doctor of Philosophy (Ph.D.); Atmospheric and Oceanic Sciences**

Our program applies mathematics, physics, computing, and sometimes chemistry to study the atmosphere and/or oceans. The ideal student would therefore have a strong quantitative background in one or more of these fields. Although some of our students have undergraduate knowledge of meteorology or physical oceanography, such background is not necessary to succeed in the program. McGill offers the only program in Canada that includes both atmospheric and oceanic sciences. Students benefit from a large professor-to-student ratio, access to state-of-the-art computing, remote sensing, and atmospheric chemistry laboratory equipment. The Department also has close ties with Environment Canada's numerical weather prediction centre in Dorval, Quebec. Students who do not choose to continue in academia find employment in a variety of areas including research careers at government labs such as Environment Canada.

**11.1.3 Atmospheric and Oceanic Sciences Admission Requirements and Application Procedures**

**11.1.3.1 Admission Requirements**

Applicants for the M.Sc. program must meet the general requirements of Graduate and Postdoctoral Studies 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. 1 rather than the Ph.D. 2 level, and devote the first year of the program mainly to coursework.

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

**11.1.3.2 Application Procedures**

McGill's online application form for graduate program candidates is available at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply).

**11.1.3.3 Dates for Guaranteed Consideration**

Canadian	International	Special/Exchange/Visiting
Fall: March 31	Fall: March 31	Fall: March 31
Winter: Sept. 15	Winter: Sept. 15	Winter: Sept. 15
Summer: N/A	Summer: N/A	Summer: N/A



**Note:** We are not willing to consider any applications to be admitted for the Summer term.

#### 11.1.4 Atmospheric and Oceanic Sciences Faculty

##### Chair

J.R. Gyakum

##### Emeritus Professors

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

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

L.A. Mysak; C.M., B.Sc.(Alta.), M.Sc.(Adel.), A.M., Ph.D.(Harv.), F.R.S.C. (*Canada Steamship Lines Professor of Meteorology*)

R.R. Rogers; B.S.(Texas), S.M.(MIT), Ph.D.(NYU)

I. Zawadzki; B.Sc.(Buenos Aires), M.Sc., Ph.D.(McG.), F.R.S.C.

Students registered in M.Sc. programs are expected to regularly attend both the student seminar series (ATOC 751D1/D2 or ATOC 752D1/D2) and the Department seminar series during the entire period of their enrolment in the program.

**Complementary Courses (21 credits)**

Must complete or have completed the following courses or equivalent:

ATOC 512	(3)	Atmospheric and Oceanic Dynamics
ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
ATOC 521	(3)	Cloud Physics
ATOC 525	(3)	Atmospheric Radiation
ATOC 530	(3)	Paleoclimate Dynamics
ATOC 531	(3)	Dynamics of Current Climates
ATOC 540	(3)	Synoptic Meteorology 1
ATOC 541	(3)	Synoptic Meteorology 2
ATOC 568	(3)	Ocean Physics
ATOC 619*	(3)	Advanced Atmospheric Chemistry
ATOC 626	(3)	Atmospheric/Oceanic Remote Sensing
ATOC 646	(3)	Mesoscale Meteorology
ATOC 666	(3)	Topics In Ocean Circulation
CHEM 619*	(3)	Advanced Atmospheric Chemistry

\* Students may select either ATOC 619 or CHEM 619.

Or other courses at the 500 level or higher recommended by the Department's Graduate Program Director.

Students with a strong background in atmospheric or oceanic science, or a Diploma in Meteorology, will take at least the 7 credit minimum. Students with no previous background in atmospheric or oceanic science must take the 20 credit maximum.

**11.1.6 Master of Science (M.Sc.); Atmospheric and Oceanic Sciences (Thesis) — Environment (45 credits)****Thesis Courses (24 credits)**

ATOC 691	(3)	Master's Thesis Literature Review
ATOC 692	(6)	Master's Thesis Research 1
ATOC 694	(3)	Master's Thesis Progress Report and Seminar
ATOC 699	(12)	Master's Thesis

Students registered in M.Sc. programs are expected to regularly attend both the student seminar series (ATOC 751D1/D2 or ATOC 752D1/D2) and the Department seminar series during the entire period of their enrolment in the program.

**Required Courses (6 credits)**

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3

**Complementary Courses (15 credits)**

12 credits of Departmental courses chosen from the following:

ATOC 512	(3)	Atmospheric and Oceanic Dynamics
ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
ATOC 521	(3)	Cloud Physics
ATOC 525	(3)	Atmospheric Radiation
ATOC 530	(3)	Paleoclimate Dynamics
ATOC 531	(3)	Dynamics of Current Climates
ATOC 540	(3)	Synoptic Meteorology 1
ATOC 541	(3)	Synoptic Meteorology 2
ATOC 568	(3)	Ocean Physics
ATOC 619*	(3)	Advanced Atmospheric Chemistry
ATOC 626	(3)	Atmospheric/Oceanic Remote Sensing
ATOC 646	(3)	Mesoscale Meteorology
ATOC 666	(3)	Topics In Ocean Circulation
CHEM 619*	(3)	Advanced Atmospheric Chemistry

or another course at the 500 level or higher recommended by the Department's Graduate Program Director.

\* Students may select either ATOC 619 or CHEM 619.

3 credits of MSE courses chosen from the following:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or another course at the 500 level or higher recommended by the advisory committee and approved by the Environment Option Committee.

### 11.1.7 Doctor of Philosophy (Ph.D.); Atmospheric and Oceanic Sciences

#### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner.

The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate

ATOC 751D1	(.5)	Seminar: Physical Meteorology
ATOC 751D2	(.5)	Seminar: Physical Meteorology
ATOC 752D1	(.5)	Atmospheric, Oceanic and Climate Dynamics
ATOC 752D2	(.5)	Atmospheric, Oceanic and Climate Dynamics

And 6 credits from the Department of Atmospheric and Oceanic Sciences, at the 500 or 600 level, as approved by the Graduate Program Director.

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## 11.2 Biology

### 11.2.1 Location

Department of Biology  
Stewart Biological Sciences Building, Room W4/8  
1205 Dr. Penfield Avenue  
Montreal, QC H3A 1B1  
Canada

Telephone: 514-398-6400

Fax: 514-398-5069

Email: [gradinfo.biology@mcgill.ca](mailto:gradinfo.biology@mcgill.ca)

Website: <http://biology.mcgill.ca>

### 11.2.2 About Biology

The Department offers graduate training in many areas of biology with particular strengths in the following areas: Molecular Biology and Genetics; Cell and Developmental Biology; Ecology, Biodiversity, and Conservation; Evolution; Neurobiology; Bioinformatics; and Plant Biology. In addition to the regular M.Sc. and Ph.D. programs, the Biology Department of

***section 11.2.5: Master of Science (M.Sc.); Biology (Thesis) (45 credits)***

Alumni have gone on to pursue a wide range of careers. Many go on to pursue postdoctoral research and later assume faculty positions, while others work as researchers in industry, wildlife biologists, forensic technologists, or science policy advisers, to name a few.

***section 11.2.6: Master of Science (M.Sc.); Biology (Thesis) — Environment (48 credits)***

The Environment graduate option offers students the opportunity to pursue environment-focused graduate research in the context of a range of different fields, including Anthropology, Atmospheric and Oceanic Sciences, Biology, Bioresource Engineering, Earth and Planetary Sciences, Entomology, Epidemiology, Experimental Medicine, Geography, Law, Microbiology, Plant Science, Parasitology, Philosophy, Renewable Resources, and Sociology. Through a program consisting of research, seminars, and two courses, this option adds a layer of interdisciplinarity that challenges students to develop and defend their research and think in a broader context. Students graduating from the M.Sc. or Ph.D. program under the Environment option will therefore be able to understand and critically analyze an environmental problem from several perspectives (e.g., social, cultural, scientific, technological, ethical, economic, political, legislative) and at a local, national, regional, and/or international scale. In addition, they will be able to explore and critically assess analytic and institutional approaches for alleviating the selected environmental problem, and to effectively communicate research findings to both specialist and lay audiences. Coordinated and administered through the McGill School of Environment (MSE), the Environment option is aimed at students who wish to use interdisciplinary approaches in their graduate research on environmental issues and who wish to benefit from interactions that will occur as they interact with students from a wide range of disciplines.

***section 11.2.7: Master of Science (M.Sc.); Biology (Thesis) — Neotropical Environment (48 credits)***

The McGill-Smithsonian Tropical Research Institute (STRI) Neotropical Environment Option (NEO) is a research-based option for M.Sc. or Ph.D. students in the departments of Anthropology, Biology, Bioresource Engineering, Geography, Natural Resource Sciences, Plant Science, and Political Science at McGill University. The NEO is aimed at students who wish to focus their graduate research on environmental issues relevant to the Neotropics and Latin American countries. The typical NEO student has a very strong interest in conservation because NEO courses focus on conservation issues. Students in the program have diverse backgrounds, including both Latin American and Canadian students, and must either speak Spanish or enrol in a Spanish course when they enter the program. NEO favours interdisciplinary approaches to research and learning through the participation of researchers from McGill and from STRI. Accordingly, each student will have two co-supervisors, one from McGill and one from STRI. Students will complete their research in Latin America, and the NEO's core and complementary courses will be taught in Panama. Participation in the MSE-Panama Symposium presentation in Montreal is also required. Through this educational approach, NEO seeks to facilitate a broader understanding of tropical environmental issues and the development of skills relevant to working in the tropics.

***section 11.2.8: Master of Science (M.Sc.); Biology (Thesis) — Bioinformatics (48 credits)***

The goal of the Bioinformatics option is to train students to become researchers in the interdisciplinary field of Bioinformatics, which lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. This work includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating Bioinformatics data, the integration of biological databases, and the use of algorithms and statistics. The Bioinformatics graduate option consists of a number of interdisciplinary courses, as well as a seminar designed to bring students from many backgrounds together and to provide a thorough overview of research in this field. The typical entering student will be affiliated with one of about fourteen different "home" departments in three different faculties, chosen based on his/her specific field of expertise, and will therefore meet the specific requirements for that department. The student will additionally be evaluated according to requirements specific to the Bioinformatics option. Students in this option will have access to five specialized courses that are open only to students within the Bioinformatics option. At the M.Sc. level, students successful in the NEO's core and complementary courses will receive 96 core s8Tj1 0 0 1 300(v)Tj1 0 0 1n.

***section 11.2.10: Doctor of Philosophy (Ph.D.); Biology — Developmental Biology***

areas before choosing a supervisor for the remainder of their graduate work. Students enter directly from their undergraduate studies, and the primary criterion for admission to the program is a strong background in research at the undergraduate level. It is also expected that candidates will have a CGPA of 3.5 or better, although exceptions may be made for applicants with outstanding research experience. Students will also participate in courses, retreats, and symposia specific to the program.

***section 11.2.11: Doctor of Philosophy (Ph.D.); Biology — Environment***

The Environment graduate option offers students the opportunity to pursue environment-focused graduate research in the context of a range of different fields, including Anthropology, Atmospheric and Oceanic Sciences, Biology, Bioresource Engineering, Earth and Planetary Sciences, Entomology, Epidemiology, Experimental Medicine, Geography, Law, Microbiology, Plant Science, Parasitology, Philosophy, Renewable Resources, and Sociology. Through a program consisting of research, seminars, and two courses, this option adds a layer of interdisciplinarity that challenges students to develop and defend their research and think in a broader context. Students graduating from the M.Sc. or Ph.D. program under the Environment option will therefore be able to understand and critically analyze an environmental problem from several perspectives (e.g., social, cultural, scientific, technological, ethical, economic, political, legislative) and at a local, national, regional, and/or international scale. In addition, they will be able to explore and critically assess analytic and institutional approaches for alleviating the selected environmental problem, and to effectively communicate research findings to both specialist and lay audiences. Coordinated and administered through the McGill School of Environment (MSE), the Environment option is aimed at students who



### 11.2.3.2 Application Procedures

Application to the graduate program in Biology is made using an online web application form. A direct link to the online form can be found on the Biology Department website.

All applicants should read the academic faculty and admission procedure sections on the Biology Department website before completing the application form. These guidelines contain specific information on the application process, summaries of the research areas of staff, and contact information.

### 11.2.3.3 Dates for Guaranteed Consideration

Canadian	International	Special/Exchange/Visiting
Fall: March 15	Fall: Jan. 15	Fall: Same as Canadian/International
Winter: Oct. 15	Winter: Aug. 15	Winter: Same as Canadian/International
Summer: N/A	Summer: N/A	Summer: N/A

If application materials are received after the Dates for Guaranteed Consideration, review of the applicant's file may be delayed until the following admittance period. All inquiries pertaining to admission procedures should be directed to the Graduate Admissions Secretary.



**Note:** Applications for Summer term admission will not be considered.

McGill's online application form for graduate program candidates is available at [www.mcgill.ca/gradapplicants/apply](http://www.mcgill.ca/gradapplicants/apply).

## 11.2.4 Biology Faculty

### Chair

Graham A.C. Bell

### Chair of Graduate Program

Laura Nilson

### Emeritus Professors

A. Howard Bussey; B.Sc., Ph.D.(Brist.), F.R.S.C.

Robert L. Carroll; B.S.(Mich.), M.A., Ph.D.(Harv.), F.R.S.C.

Ronald Chase; A.B.(Stan.), Ph.D.(MIT)

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

Donald L. Kramer; B.Sc.(Boston Coll.), Ph.D.(Br. Col.)

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

### Professors

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

Gregory G. Brown 501.532 Tma.64 l, D(gj1 1 0 5S1 0 5S1 0 5S2 5S2/Bell; (Ind.))Tj1 0 0 1 70.98.19.292 413.Bp 324.453 Tm(A.pma,01 8.1 Tf1 0 0 1 7F)Tj1 0 0 1 3 0

### Associate Professors

Ehab Abouheif; M.Sc.(C' dia), Ph.D.(Duke)

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

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

François Fagotto; Ph.D.(Neuchâtel)

Gregor Fussmann; Dipl.(Berlin), Ph.D.(Max Planck Institute)

Andrew Gonzalez; B.Sc.(Nott.), Ph.D.(Imperial Coll., Lond.)

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

Paul Harrison; B.Sc.(NUI), Ph.D.(Lond.) (*on sabbatical until December 31, 2012*)

Andrew Hendry; B.Sc.(Vic., BC), M.Sc., Ph.D.(Wash.) (*joint appt. with Redpath Museum*)

Rudiger Krahe; Dipl.(Alexander U.), Ph.D.(Humboldt)

Brian Leung; B.Sc.(Br. Col.), Ph.D.(Car.)

Laura Nilson; B.A.(Colgate), Ph.D.(Yale)

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

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

Frieder Schoeck; Dipl.(Erhanger), Ph.D.(Max Planck Institute)

Jacalyn Vogel; M.Sc.(E. Ill.), Ph.D.(Kansas) (*Canadian Pacific Chair in Biotechnology*)

Tamara Western; B.Sc.(Dal.), Ph.D.(Br. Col.)

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

### Assistant Professors

Gary Brouhard; M.S.E., Ph.D.(Mich.)

David Dankort; B.Sc., Ph.D.(McM.)

Jonathan Davies; M.Sc.(Cape Town), Ph.D.(Imperial Coll., Lond.)

Irene Gregory-Eaves; B.Sc.(Vic., BC), M.Sc., Ph.D.(Qu.) (*on sabbatical until August 31, 2013*)

Nam-Sung Moon; B.Sc., Ph.D.(McG.)

Jon Sakata; B.A.(C'Nell), Ph.D.(Texas-Austin)

Alanna J. Watt; B.Sc.(C' dia), Ph.D.(Brandeis)

Sarah Woolley; B.Sc.(Duke), Ph.D.(Texas-Austin)

Hugo Zheng; M.Sc.(Helsinki), Ph.D.(Oxf. Brookes)

### Associate Members

Anatomy and Cell Biology: Nathalie Lamarche-Vane, Craig Mandato

Anthropology: Colin Chapman

Bellairs: Judith Mendes

Biochemistry: Maxime Bouchard

Centre for Research in Neuroscience: Sal Carbonetto, Yong Rao, Donald Van Meyel

MCH: Feige Kaplan, Rima Rozen

Medical Genetics, Chair: David Rosenblatt

MNI: K

## **Adjunct Professors**

CNRS Moulis, France: M. Loreau

IRCM: Michel Cayouette, Frédéric Charron, Artur Kania, Marie Kmita

NRC Lab: Malcolm S. Whiteway

### 11.2.7 Master of Science (M.Sc.); Biology (Thesis) — Neotropical Environment (48 credits)

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

#### Thesis Courses (39 credits)

BIOL 697	(13)	Master's Thesis Research 1
BIOL 698	(13)	Master's Thesis Research 2
BIOL 699	(13)	Master's Thesis Research 3

#### Required Courses (6 credits)

BIOL 640	(3)	Tropical Biology and Conservation
ENVR 610	(3)	Foundations of Environmental Policy

#### Elective Courses (3 credits)

3 credits, at the 500 level or higher, on environmental issues to be chosen in consultation with and approved by the student's supervisor AND the Neotropical Environment Options Director.

### 11.2.8 Master of Science (M.Sc.); Biology (Thesis) — Bioinformatics (48 credits)

#### Thesis Courses (39 credits)

BIOL 697	(13)	Master's Thesis Research 1
BIOL 698	(13)	Master's Thesis Research 2
BIOL 699	(13)	Master's Thesis Research 3

#### Required Courses (3 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

#### Complementary Courses (6 credits)

6 credits from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics

BIOL 702 (6) Ph.D. Seminar

### Complementary Courses (6 credits)

Two 3-credit courses, or equivalent, at the 500, 600, or 700 level in Biology or other departments, and approved by the Supervisory Committee.

## 11.2.10 Doctor of Philosophy (Ph.D.); Biology — Developmental Biology

### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

### Required Courses (12 credits)

BIOL 520	(3)	Gene Activity in Development
BIOL 532	(3)	Developmental Neurobiology Seminar
BIOL 700	(0)	Doctoral Qualifying Examination
BIOL 702	(6)	Ph.D. Seminar

### Complementary Course (3 credits)

One course chosen from the following:

BIOL 544	(3)	Genetic Basis of Life Span
BIOL 569	(3)	Developmental Evolution
BIOL 592	(3)	Integrated Bioinformatics
EXMD 607	(3)	Molecular Control of Cell Growth
EXMD 608	(3)	Molecular Embryology
HGEN 692	(3)	Human Genetics
NEUR 605	(3)	Neuroscience Seminar 4

or another graduate course at the 500, 600, or 700 level chosen in consultation with the student's supervisor.

Additional courses may be required if the student's background is deemed insufficient.

## 11.2.11 Doctor of Philosophy (Ph.D.); Biology — Environment

### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

### Required Courses (12 credits)

BIOL 700	(0)	Doctoral Qualifying Examination
BIOL 702	(6)	Ph.D. Seminar
ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3

**Complementary Course (3 credits)**

One course chosen from the following:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or another graduate course at the 500, 600, or 700 level recommended by the advisory committee and approved by the Environment Option Committee.

**11.2.12 Doctor of Philosophy (Ph.D.); Biology — Neotropical Environment**

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

**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Courses (12 credits)**

BIOL 640	(3)	Tropical Biology and Conservation
BIOL 700	(0)	Doctoral Qualifying Examination
BIOL 702	(6)	Ph.D. Seminar
ENVR 610	(3)	Foundations of Environmental Policy

**Elective Courses (3 credits)**

3 credits, at the 500 level or higher, on environmental issues to be chosen in consultation with and approved by the student's supervisor AND the Neotropical Environment Options Director.

**11.2.13 Doctor of Philosophy (Ph.D.); Biology — Bioinformatics****Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Courses (9 credits)**

BIOL 700	(0)	Doctoral Qualifying Examination
BIOL 702	(6)	Ph.D. Seminar
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

**Complementary Courses (6 credits)**

Two courses chosen from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

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## 11.3 Chemistry

### 11.3.1 Location

Department of Chemistry  
 Otto Maass Chemistry Building  
 801 Sherbrooke Street West  
 Montreal, QC H3A 0B8  
 Canada

Telephone: 514-398-6999

Fax: 514-398-3797

Email: [graduate.chemistry@mcgill.ca](mailto:graduate.chemistry@mcgill.ca)

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

### 11.3.2 About Chemistry

#### Research in Chemistry

Members of the Department are organized into various research themes. Some of the current research interests are listed below, and are presented in much more detail on the Departmental website at [www.chemistry.mcgill.ca](http://www.chemistry.mcgill.ca).

#### Analytical - Environmental

Analytical-Environmental research at McGill entails a wide range of exciting fundamental and applied research with focus on state-of-the-art instrumental development in spectroscopy; imaging; chemometric and analytical bio-spectroscopy; artificial intelligence; ultra trace sampling; state-of-the-art atmospheric kinetics and photochemistry; thermochemical, box, and cloud modelling; as well as the development and application of state-of-the-art numerical models of the chemistry of the regional and global atmosphere. Our collective research has direct implications in fields such as materials, environmental, and biomedical chemistry.

#### Chemical Biology

The Chemical Biology Thematic Group is engaged in a diverse range of research topics, which span structural biology, enzymology, nucleic acid research, signalling pathways, single-molecule biophysics, and biophysical chemistry of living tissues. Among the themes that unite the research being performed in this group is the attempt to learn new chemistry and physics from biological systems.

We have projects relating to pharmaceutically relevant enzymes such as those involved in drug metabolism and antibiotic resistance; development of therapeutic agents in the control of inflammation, cancer and viral infections; the chemical biology of NO; quantification of bioenergetic markers of metabolism; self-assembly mechanisms of the HIV-1 virion capsid; liposome microarray systems to address membrane protein dynamics and recognition; studies on reactive oxygen species translocation across the aqueous/lipid membrane interface; RNAi/antisense technologies; dynamic combinatorial chemistry; protein dynamics and function; mechanistic aspects involved in cellular adhesion and transport in membrane and zeolite channels; and cutting-edge microscopes used to examine transport, motility, and reactivity in cells.

#### Chemical Physics

The research interests of the members of the Chemical Physics Thematic group are diverse, with groups focusing on high-end laser and NMR spectroscopies, kinetics and modelling of atmospheric chemical reactions, experimental and theoretical biophysical chemistry, polymers at interfaces, and statistical and quantum mechanics. In the field of biophysical chemistry, single molecule spectroscopy is being used to probe enzyme function as well as DNA recombination and repair. Our recent advances in image correlation spectroscopic techniques now allow researchers to precisely follow the macromolecular dynamics in living cells. In a similar vein, breakthrough ultra-fast electron diffraction experiments have opened the window to real time observation of the making and breaking of chemical bonds. State-of-the-art multi-pulse femtosecond spectroscopy experiments are being applied to interesting and technologically important new materials such as photonic crystals and quantum dot superlattices. A molecular-level picture of polymer dynamics and structure at surfaces and interfaces is being developed through theoretical modelling, high-field solids NMR spectroscopy, electron microscopy, and other surface characterization methods. In the area of atmospheric chemistry, the chemical transformation of the atmosphere is being modelled both experimentally and theoretically to understand how these processes are currently affecting and driving climate change. Finally, we have basic theory projects relating to the experimental work just described, as well as in transport and structure in complex colloidal or zeolite systems, protein dynamics, and fundamental issues in quantum and statistical mechanics.

#### Materials Chemistry





Canadian	International	Special/Exchange/Visiting
Winter: Oct. 15	Winter: Sept. 30	Winter: Oct. 15
Summer: N/A	Summer: N/A	Summer: N/A



**Note:** We are not willing to consider any applications to be admitted for the Summer term.

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

### 11.3.4 Chemistry Faculty

#### Chair

R.B. Lennox

#### Director of Graduate Studies

N. Moitessier

#### Emeritus Professors

T.H. Chan; B.Sc.(Tor.), M.A., Ph.D.(Princ.), F.C.I.C., F.R.S.C.

A. Eisenberg; B.S.(Wor. Poly.), M.A., Ph.D.(Princ.), F.C.I.C.

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

D.FR. Gilson; B.Sc.(Univ. Coll., Lond.), M.Sc., Ph.D.(Br. Col.)

D.G. Gray; B.Sc.(Belf.), M.Sc., Ph.D.(Manit.), F.C.I.C.

J.F. Harrod; B.Sc., Ph.D.(Birm.), F.R.S.C.

A.S. Hay; B.Sc.(Alta.), Ph.D.(Ill.), F.R.S.

R.H. Marchessault; B.Sc.(Montr.), Ph.D.(McG.), F.C.I.C., F.R.S.C.

M.A. Whitehead; B.Sc., Ph.D., D.Sc.(Lond.), F.C.I.C.

#### Professors

B.A. Arndtsen; B.A.(Car.), Ph.D.(Stan.)

D.S. Bohle; B.A.(Reed), M.Phil., Ph.D.(Auck.)

D.H. Burns; B.Sc.(Puget Sound), Ph.D.(Wash.)

I.S. Butler; B.Sc., Ph.D.(Brist.), F.C.I.C.

M.J. Damha; B.Sc., Ph.D.(McG.), F.C.I.C.

D.N. Harpp; A.B.(Middlebury), M.A.(Wesl.), Ph.D.(N. Carolina), F.C.I.C.

R.B. Lennox; B.Sc., M.Sc., Ph.D.(Tor.), F.C.I.C.

C.J. Li; B.Sc.(Zhengzhou), M.S.(Chin. Acad. Sci.), Ph.D.(McG.)

D.M. Ronis; B.Sc.(McG.), Ph.D.(MIT)

E.D. Salin; B.Sc.(Calif.), Ph.D.(Ore.), F.C.I.C.

B.C. Sanctuary; B.Sc., Ph.D.(Br. Col.)

H. Sleiman; B.Sc.(A.U.B.), Ph.D.(Stan.)

Y.S. Tsantrizos; B.Sc., M.Sc., Ph.D.(McG.)

T.G.M. van de Ven; Kand. Doc.(Utrecht), Ph.D.(McG.)

#### Associate Professors

M.P. Andrews; B.Sc., M.Sc., Ph.D.(Tor.)

P. Ariya; B.Sc., Ph.D.(York)

### Associate Professors

K. Auclair; B.Sc.(UQAC), Ph.D.(Alta.)  
C.J. Barrett; B.Sc., M.Sc., Ph.D.(Qu.)  
G. Cosa; B.Sc.(Argentina), Ph.D.(Ott.)  
W.C. Galley; B.Sc.(McG.), Ph.D.(Calif.)  
J.L. Gleason; B.Sc.(McG.), Ph.D.(Virg.)  
A. Kakkar; B.Sc., M.Sc.(Chan. U., India), Ph.D.(Wat.)  
P. Kambhampati; B.A.(Car. Coll.), Ph.D.(Texas)  
A. Mittermaier; B.Sc.(Guelph), Ph.D.(Tor.)  
N. Moitessier; M.Sc., Ph.D.(Nancy)  
D. Perepichka; B.Sc.(Donetsk St. U, Ukraine), Ph.D.(Nat. Aca. Sci., Ukraine)  
J.F. Power; B.Sc., Ph.D.(C'dia)  
L. Reven; B.A.(Car.), Ph.D.(Ill.)  
P. Wiseman; B.Sc.(St. FX), Ph.D.(W. Ont.)

### Assistant Professors

A.S. Blum; B.A.(Princ.), Ph.D.(Wash.)  
M. Bourqui; B.Sc.(EPF Lausanne), Ph.D.(ETH Zürich)  
T. Friš i ; B.Sc.(Zagreb), Ph.D.(Iowa)  
J. P. Lumb; B.Sc.(C'nell), Ph.D.(Calif., Berk.)  
A. Moores; B.Sc., Ph.D.(École Polytechnique, Paris)  
B. Siwick; B.A.Sc. Eng. Sci., M.Sc., Ph.D.(Tor.)

### Associate Members

J.A. Finch (*Mining, Metals and Materials Engineering*)  
P. Grütter (*Physics*)  
O.A. Mamer (*University Clinic, RVH*)  
R. Schirmacher (*MNI*)

### Adjunct Professors

Y. Guindon, C. Reber, I. Wharf, C.T. Yim, R. Zamboni

## 11.3.5 Master of Science, Applied (M.Sc.A.); Chemistry (Non-Thesis) (45 credits)

(Not offered in 2012-2013)

### Research Project (15 credits)

CHEM 699 (15) Project

### Complementary Courses (30 credits)

15 credits, fi

(24-31 credits)

At least 24 credits chosen from the following:

CHEM 691	(3)	M.Sc. Thesis Research 1
CHEM 692	(6)	M.Sc. Thesis Research 2
CHEM 693	(9)	M.Sc. Thesis Research 3
CHEM 694	(12)	M.Sc. Thesis Research 4
CHEM 695	(15)	M.Sc. Thesis Research 5
CHEM 696	(6)	M.Sc. Thesis Research 6
CHEM 697	(9)	M.Sc. Thesis Research 7
CHEM 698	(12)	M.Sc. Thesis Research 8

#### Required Courses

(5 credits)

CHEM 650	(1)	Seminars in Chemistry 1
CHEM 651	(1)	Seminars in Chemistry 2
CHEM 688	(3)	Assessment

#### Complementary Courses

(9-16 credits)

Students will normally take 9-16 credits of CHEM (or approved) courses at the 500 or 600 level.

### 11.3.7 Master of Science (M.Sc.); Chemistry (Thesis) — Chemical Biology (45 credits)

(Not offered in 2012-2013)

#### Thesis Courses (24 credits)

(minimum 24 credits)

At least 24 credits chosen from the following:

CHEM 691	(3)	M.Sc. Thesis Research 1
CHEM 692	(6)	M.Sc. Thesis Research 2
CHEM 693	(9)	M.Sc. Thesis Research 3
CHEM 694	(12)	M.Sc. Thesis Research 4
CHEM 695	(15)	M.Sc. Thesis Research 5
CHEM 696	(6)	M.Sc. Thesis Research 6
CHEM 697	(9)	M.Sc. Thesis Research 7
CHEM 698	(12)	M.Sc. Thesis Research 8

#### Required Courses (5 credits)

CHEM 650	(1)	Seminars in Chemistry 1
CHEM 651	(1)	Seminars in Chemistry 2
CHEM 688	(3)	Assessment

#### Complementary Courses (11 credits)

(minimum 11 credits)

2 credits, two of the following courses:

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4

Students will take at least three courses from the following list, including at least 3 credits from the first two courses listed below:

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 502	(3)	Advanced Bio-Organic Chemistry
CHEM 503	(3)	Drug Design and Development 1
CHEM 504	(3)	Drug Design and Development 2
CHEM 514	(3)	Biophysical Chemistry
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 503	(3)	Drug Discovery and Development 1
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2
PHAR 707	(3)	Topics in Pharmacology 6

The remaining credits may be graduate-level courses approved by the Department.

### 11.3.8 Doctor of Philosophy (Ph.D.); Chemistry

#### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

#### Required Courses

CHEM 650	(1)	Seminars in Chemistry 1
CHEM 651	(1)	Seminars in Chemistry 2
CHEM 688	(3)	Assessment
CHEM 701	(0)	Comprehensive Examination 1
CHEM 702	(0)	Comprehensive Examination 2

#### Complementary Courses

Students entering the program with an M.Sc. degree will normally take three (3) graduate-level courses. Students entering without an M.Sc. degree will normally take five (5) graduate-level courses.

Students may be required to take advanced undergraduate courses if background deficient.

**11.3.9 Doctor of Philosophy (Ph.D.); Chemistry — Chemical Biology**

(Not offered in 2012-2013)

**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Courses**

BIOC 610	(1)	Seminars in Chemical Biology 1
BIOC 611	(1)	Seminars in Chemical Biology 3
BIOC 689	(1)	Seminars in Chemical Biology 2
BIOC 690	(1)	Seminars in Chemical Biology 4
CHEM 650	(1)	Seminars in Chemistry 1
CHEM 651	(1)	Seminars in Chemistry 2
CHEM 688	(3)	Assessment
CHEM 701	(0)	Comprehensive Examination 1
CHEM 702	(0)	Comprehensive Examination 2

**Complementary Courses**

Students entering the program with an M.Sc. degree will normally take three (3) graduate-level courses. Students entering without an M.Sc. degree will normally take five (5) graduate-level courses. At least three courses must be from the following list, including at least 3 credits from the first two courses listed below.

BIOC 603	(3)	Genomics and Gene Expression
BIOC 604	(3)	Macromolecular Structure
CHEM 502	(3)	Advanced Bio-Organic Chemistry
CHEM 503	(3)	Drug Design and Development 1
CHEM 504	(3)	Drug Design and Development 2
CHEM 514	(3)	Biophysical Chemistry
CHEM 522	(3)	Stereochemistry
CHEM 591	(3)	Bioinorganic Chemistry
CHEM 621	(5)	Reaction Mechanisms in Organic Chemistry
CHEM 629	(5)	Organic Synthesis
CHEM 655	(4)	Advanced NMR Spectroscopy
PHAR 503	(3)	Drug Discovery and Development 1
PHAR 504	(3)	Drug Discovery and Development 2
PHAR 562	(3)	General Pharmacology 1
PHAR 563	(3)	General Pharmacology 2
PHAR 707	(3)	Topics in Pharmacology 6

The remaining credits may be 500-, 600-, or 700-level courses approved by the Department.

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## **11.4 Computer Science**

### **11.4.1 Location**

School of Computer Science  
McConnell Engineering, Room 318  
3480 University Street  
Montreal, QC H3A 0E9  
Canada

Telephone: 514-398-7071 ext. 00074

Fax: 514-398-3883

Email:







**Associate Members**

D.J. Levitin (*Psychology*)  
 D. Schlimm (*Philosophy*)  
 R. Sengupta (*Geography*)  
 B.F. Shepherd (*Mathematics & Statistics*)  
 T.R. Shultz (*Psychology*)  
 R. Sieber (*Geography*)

**Adjunct Professors**

P.J. Mosterman, T. Perkins, I. Rekleitis, G.O. Sabidussi, M. Tabach Izadi, P. Tesson, H. Vangheluwe

**11.4.5 Master of Science (M.Sc.); Computer Science (Thesis) (45 credits)****Thesis Courses (24 credits)**

24 credits selected from:

COMP 691	(2)	Thesis Research 1
COMP 696	(3)	Thesis Research 2
COMP 697	(4)	Thesis Research 3
COMP 698	(9)	Thesis Research 4
COMP 699	(15)	Thesis Research 5

**Complementary Courses (21 credits)**

At least 21 credits of 500-, 600-, or 700-level COMP courses, including at least 12 credits of 4-credit courses.

Note: Students with an appropriate background can substitute 3 credits by COMP 696 and 4 credits by COMP 697.

**11.4.6 Master of Science (M.Sc.); Computer Science (Thesis) — Computational Science and Engineering (45 credits)****Thesis Courses (24 credits)**

24 credits selected from:

COMP 691	(2)	Thesis Research 1
COMP 696	(3)	Thesis Research 2
COMP 697	(4)	Thesis Research 3
COMP 698	(9)	Thesis Research 4
COMP 699	(15)	Thesis Research 5

**Required Courses**

One credit selected as follow:

COMP 669D1	(.5)	Computational Science Engineering Seminar
COMP 669D2	(.5)	Computational Science Engineering 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.

Note: Students with an appropriate background can substitute 3 credits by COMP 696 and 4 credits by COMP 697, but still need to take 6-8 credits from List A and 6-8 credits from List B.

**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: Application 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 572	(3)	Computational Hydraulics
CIVE 603	(4)	Structural Dynamics
COMP 505	(3)	Advanced Computer Architecture
COMP 557	(3)	Fundamentals of Computer Graphics
COMP 558	(3)	Fundamentals of Computer Vision
COMP 567	(3)	Discrete Optimization 2
COMP 621	(4)	Program Analysis and Transformations
COMP 642	(4)	Numerical Estimation Methods
COMP 767	(4)	Advanced Topics: Applications 2
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
MATH 761	(4)	Topics in Applied Mathematics 1
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 572	(3)	Introduction to Robotics
MECH 573	(3)	Mechanics of Robotic Systems
MECH 576	(3)	Geometry in Mechanics
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)	Fundamentals of Heat Transfer
MECH 654	(4)	Compt. Fluid Flow and Heat Transfer

#### 11.4.7 Master of Science (M.Sc.); Computer Science (Thesis) — Bioinformatics (45 credits)

##### Thesis Courses (24 credits)

24 credits selected from:

COMP 691	(2)	Thesis Research 1
COMP 696	(3)	Thesis Research 2
COMP 697	(4)	Thesis Research 3
COMP 698	(9)	Thesis Research 4
COMP 699	(15)	Thesis Research 5

##### Required Courses (3 credits)

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

##### Complementary Courses (18 credits)

6 credits chosen from the following courses:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

12 credits of 4-credit courses chosen from 500-, 600-, or 700-level Computer Science courses in consultation with the candidate's supervisor.

Note: Students with an appropriate background can substitute 4 credits by COMP 697.

#### Master of Science (M.Sc.);4

**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Courses**

COMP 700	(0)	Ph.D. Comprehensive Examination
COMP 701	(3)	Thesis Proposal and Area Examination

**Complementary Courses**

18-24 credits selected from:

**Category A: Theory and Applications**

COMP 507	(3)	Computational Geometry
COMP 523	(3)	Language-based Security
COMP 524	(3)	Theoretical Foundations of Programming Languages
COMP 525	(3)	Formal Verification
COMP 531	(3)	Advanced Theory of Computation
COMP 540	(3)	Matrix Computations
COMP 547	(4)	Cryptography and Data Security
COMP 552	(4)	Combinatorial Optimization
COMP 554	(4)	Approximation Algorithms
COMP 560	(3)	Graph Algorithms and Applications
COMP 561	(4)	Computational Biology Methods and Research
COMP 564	(3)	Computational Gene Regulation
COMP 566	(3)	Discrete Optimization 1
COMP 567	(3)	Discrete Optimization 2
COMP 598	(3)	Topics in Computer Science 1
COMP 599	(3)	Topics in Computer Science 2
COMP 610	(4)	Information Structures 1
COMP 618	(3)	Bioinformatics: Functional Genomics
COMP 623	(4)	Concurrent Programming Languages
COMP 627	(4)	Theoretical Programming Languages
COMP 642	(4)	Numerical Estimation Methods
COMP 647	(4)	Advanced Cryptography
COMP 648	(4)	Motion Planning and Robotics
COMP 649	(4)	Quantum Cryptography
COMP 680	(4)	Mining Biological Sequences
COMP 690	(4)	Probabilistic Analysis of Algorithms
COMP 760	(4)	Advanced Topics Theory 1
COMP 761	(4)	Advanced Topics Theory 2

**Category B: Systems and Applications**

COMP 512	(4)	Distributed Systems
COMP 520	(4)	Compiler Design
COMP 521	(4)	Modern Computer Games
COMP 522	(4)	Modelling and Simulation
COMP 526	(3)	Probabilistic Reasoning and AI
COMP 529	(4)	Software Architecture
COMP 533	(3)	Object-Oriented Software Development
COMP 535	(3)	Computer Networks 1
COMP 557	(3)	Fundamentals of Computer Graphics
COMP 558	(3)	Fundamentals of Computer Vision
COMP 575	(3)	Fundamentals of Distributed Algorithms
COMP 577	(3)	Distributed Database Systems
COMP 598	(3)	Topics in Computer Science 1
COMP 599	(3)	Topics in Computer Science 2
COMP 612	(4)	Database Programming Principles
COMP 614	(4)	Distributed Data Management
COMP 621	(4)	Program Analysis and Transformations
COMP 646	(4)	Computational Perception
COMP 652	(4)	Machine Learning
COMP 655	(4)	Distributed Simulation
COMP 656	(4)	Run-Time Language Support
COMP 667	(4)	Software Fault Tolerance
COMP 762	(4)	Advanced Topics Programming 1
COMP 763	(4)	Advanced Topics Programming 2
COMP 764	(4)	Advanced Topics Systems 1
COMP 765	(4)	Advanced Topics Systems 2
COMP 766	(4)	Advanced Topics Applications 1
COMP 767	(4)	Advanced Topics: Applications 2

Note: Each year the Ph.D. Committee will determine which category COMP 598 and COMP 599 belong to according to the subjects taught in those courses.

#### 11.4.10 Doctor of Philosophy (Ph.D.); Computer Science — Bioinformatics

##### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

##### Required Courses

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
COMP 700	(0)	Ph.D. Comprehensive Examination
COMP 701	(3)	Thesis Proposal and Area Examination

**Complementary Courses**

Two courses chosen from the following:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
PHGY 603	(3)	Systems Biology and Biophysics

Additional courses at the 500, 600, or 700 level may be required at the discretion of the candidate's supervisory committee. Students who have completed the M.Sc.-level option in Bioinformatics must complete 6 credits of complementary courses not taken in the master's program.

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**11.5 Earth and Planetary Sciences****11.5.1 Location**

Department of Earth and Planetary Sciences  
Frank Dawson Adams Building  
3450 University Street  
Montreal, QC H3A 0E8  
Canada

Telephone: 514-398-6767  
Fax: 514-398-4680  
Email: [grad.eps@mcgill.ca](mailto:grad.eps@mcgill.ca)  
Website: [www.eps.mcgill.ca](http://www.eps.mcgill.ca)

**11.5.2 About Earth and Planetary Sciences**

The Department of Earth and Planetary Sciences offers both M.Sc. and Ph.D. degree programs. Graduate programs are based on research, although some courses are required to build the backgrounds of students. Research in the Department is wide-ranging. It includes studies of the geochemistry of the mantle, the nature of processes concentrating metals in hydrothermal mineral deposits, experimental studies of the controls of viscosity in magmas and the mechanisms of volcanic eruption, the fixation of mercury in marine sediments, the nature of changes in atmospheric chemistry in the early and late Precambrian, mechanisms of faulting, the evolution of topography during orogenesis, wetland hydrogeology, and planetary-scale ocean biogeochemistry and its relationship to global warming. There is a very substantial interdisciplinary basis to much of the research.

Facilities in the Department include low-temperature and pressure to high-temperature and pressure experimental laboratories, a stable-isotope mass spectrometer, XRF, laser-ablation ICP-MS, and electron microprobe, as well as atomic absorption spectrometers. Our students also make substantial use of other facilities at McGill and at nearby *Université du Québec à Montréal*.

Financial assistance is available in the form of teaching assistantships, research assistantships, and scholarships.

**Areas of Research****Aquatic Geochemistry**

Application of chemical thermodynamics, kinetics, and surface chemistry to the characterization of mineral-solution interactions in aquatic environments, carbonate geochemistry, early diagenesis of marine and coastal sediments, trace metal and environmental geochemistry in freshwater and marine systems.

**Biom mineralization**

Investigation of process occurring at the interface between inorganic and organic phases leading to the nucleation and growth of crystals in both natural and synthetic systems. Pathogenic mineralization and calcification in mammalian cells and tissues. Investigating biomarkers as signatures of ancient biological activity in terrestrial and extraterrestrial materials.

**Economic Geology**

Studies of the genesis of hydrothermal mineral deposits through a combination of field-based, experimental, and theoretical methods. Research focuses on the understanding of physico-chemical controls of mineralization, through geological mapping of deposits, experimental studies of metal solubility and speciation in hydrothermal systems, simulations of hydrothermal alteration, and theoretical studies designed to estimate conditions of alteration and ore formation. Trace-element chemistry of minerals as quantitative probes of the compositions of ore-forming fluids.

**Hydrogeology**

Studies of pore-water flow in northern peatlands, heat transport, heat as a tracer of natural systems, groundwater modelling, coupled numerical models of pore water flow and heat transport with freeze/thaw processes, and the impact of melting tropical glaciers on water resources.

### **Igneous Petrology**

Experimental studies of the structure, thermodynamics, and transport properties (diffusion and viscosity) of silicate melts and applications to igneous petrogenesis. The nature of the Earth's upper mantle and the processes within it which give rise to basaltic volcanism on both the Earth and the other terrestrial planets. Applications of laser ablation ICPMS; Petrology, geochemistry, and tectonics of the Appalachian lithosphere.

### **Mineralogy**

Chemistry and crystallography of carbonate minerals. Experimental investigations of the effect of environmental factors (e.g., solution composition and temperature) on the morphology and composition of calcite.

### **Oceanic Biogeochemistry**

Links between the marine ecosystem and climate through observations of the modern ocean, simulations of ocean biogeochemistry with computer models, and sedimentary records of past climate change.

### **Seismology**

Subduction earthquake nucleation and rupture propagation processes. Physical mechanism of aseismic deformation transients, deep non-volcanic tremors, dynamic and static stress triggering of low-frequency earthquakes and transients. Pore-fluid pressure coupling with frictional strength and slip.

### **Tectonics**

The interactions of climate and tectonics, especially in regard to the formation and degradation of orogens. Understanding the paleoclimatic and neotectonic history of Plio-Pleistocene landscape development using cosmogenic-dating techniques. Archean orogenic processes. Fluid flow in faults, granular flow in faults, and catastrophic structural/geochemical events in faults.

### **Isotopic Geochemistry and Sedimentary Geology**

Sedimentology, stratigraphy, and isotope geochemistry as guides to reconstructing ancient environments. Reconstruction of paleoenvironmental change during the Neoproterozoic to early Phanerozoic. Relationships between tectonics (i.e., supercontinental break-up and assembly), seawater chemistry and ocean redox, severe climatic fluctuations (including snowball Earth), and the origin and diversification of animals. Recovery of the geochemical memory of large-scale Earth system processes (e.g., microbial control of the global S cycle; anthropogenic manipulation of atmospheric OH abundances). Investigations of microbial biogeochemistry under an anoxic Archean atmosphere, to constrain mass fluxes in the Phanerozoic geologic sulfur cycle, and to track processes that control the pollution-cleansing oxidants (OH, O<sub>3</sub>) in the modern atmosphere.

### **Volcanology**

Petrology and geochemistry of intermediate and felsic magmas. Understanding physical processes and forecasting eruptions at active subduction-zone volcanoes. Geochemistry of volcanic gases, their use for eruption prediction, and their impact on the atmosphere.

*section 11.5.5: Mast.08 ts.Tj in tons3s167 .H, Oatheit67 F1 8.1 Tf.255 4. 390b3.84.HPannfF1 act on0ig52-rpre rpre rpre44 5251 466.122 380.387 IIDep iMomga,*





**Associate Professors**

Galen Halverson; B.A.(Mont.), M.A., Ph.D.(Harv.) (*T.H. Clark Chair in Sedimentary and Petroleum Geology*)

Jeanne Paquette; B.Sc., M.Sc.(McG.), Ph.D.(Stonybrook)

Hojatollah Vali; B.Sc., M.Sc., Ph.D.(Munich) (*Director, Electron Microscopy Centre*)

**Assistant Professors**

Eric Galbraith; B.Sc.(McG.), Ph.D.(Br. Col.)

Sarah Hall; B.A.(Hamilton), Ph.D.(Calif.-Santa Cruz)

Yajing Liu; B.Sc.(Peking), Ph.D.(Harv.)

Jeffrey McKenzie; B.Sc.(McG.), M.Sc., Ph.D.(Syrac.)

Christie Rowe; A.B.(Smith), Ph.D.(Calif.-Santa Cruz)

Vincent van Hinsberg; Propadeuse(Utrecht), Doctorandus(Utrecht), Ph.D.(Brist.)

Boswell Wing; A.B.(Harv.), M.A., Ph.D.(Johns Hop.) (*Canada Research Chair in Earth Systems Science (Geochemistry)*)

**Faculty Lecturer**

W. Minarik; B.A.(St. Olaf), M.Sc.(Wash.), Ph.D.(Rensselaer Poly.)

**Adjunct Professors**

M. Duchesne, M. Riedel, H. Short, B. Sundby, W. Trzcienski

**Retired Professor**

R. Hesse

**11.5.5 Master of Science (M.Sc.); Earth and Planetary Sciences (Thesis) (45 credits)****Thesis Courses (33 credits)**

EPSC 697	(9)	Thesis Preparation 1
EPSC 698	(12)	Thesis Preparation 2
EPSC 699	(12)	Thesis Preparation 3

**Required Course (3 credits)**

EPSC 666	(3)	Current Issues in Geosciences
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**Complementary Courses (9 credits)**

Three 3-credit 500-, 600-, or 700-level EPSC courses chosen with the approval of the supervisor or the research director and GPS.

**11.5.6 Master of Science (M.Sc.); Earth and Planetary Sciences (Thesis) — Environment (48 credits)****Thesis Courses (33 credits)**

EPSC 697	(9)	Thesis Preparation 1
EPSC 698	(12)	Thesis Preparation 2
EPSC 699	(12)	Thesis Preparation 3

**Required Courses (9 credits)**

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
EPSC 666	(3)	Current Issues in Geosciences

**Complementary Courses (6 credits)**

One 3-credit course at the 500, 600, or 700 level chosen with the approval of the supervisor or research director and GPS.

3 credits chosen from the following courses:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or another course at the 500, 600, or 700 level recommended by the advisory committee and approved by the Environment Option Committee.

**11.5.7 Doctor of Philosophy (Ph.D.); Earth and Planetary Sciences**

Highly qualified B.Sc. graduates may be admitted directly to the Ph.D. 1 year. Students with the M.Sc. degree are normally admitted to the Ph.D. 2 year. Students are required to take six graduate-level courses in the Ph.D. 1 year, and two courses plus a comprehensive oral examination in the Ph.D. 2 year.

Note: The Ph.D. requirements for this program will be changing effective Winter 2013.

**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Courses**

EPSC 666	(3)	Current Issues in Geosciences
EPSC 700	(0)	Preliminary Doctoral Examination

**Complementary Courses**

One to seven courses approved at the 500, 600, or 700 level selected in consultation with the student's supervisor and approved by the Academic Standing Committee.

**11.5.8 Doctor of Philosophy (Ph.D.); Earth and Planetary Sciences — Environment**

**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Courses**

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
EPSC 666	(3)	Current Issues in Geosciences
EPSC 700	(0)	Preliminary Doctoral Examination

### Complementary Courses

One to five courses

One course chosen from the following courses:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or another course at the 500, 600, or 700 level recommended by the advisory committee with the student's supervisor and approved by the Academic Standing Committee.

Zero to four courses at the 500, 600, or 700 level selected in consultation with the student's supervisor and approved by the Academic Standing Committee.

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## 11.6 Geography

### 11.6.1 Location

Department of Geography  
Burnside Hall  
805 Sherbrooke Street West, Room 705  
Montreal, QC H3A 0B9  
Canada

Telephone: 514-398-4111  
Fax: 514-398-7437  
Email: [grad.geog@mcgill.ca](mailto:grad.geog@mcgill.ca)  
Website: [www.geog.mcgill.ca](http://www.geog.mcgill.ca)

### 11.6.2 About Geography

The Department of Geography offers research and thesis-based graduate programs leading to a Master of Arts (M.A.), a Master of Science (M.Sc.), or a doctorate (Ph.D.). In its scope, our program includes the opportunity to conduct field-based studies in both the natural (i.e., biophysical) and the social sciences. Thematic areas of study include Political, Urban, Economic, and Health Geography; Environment and Human Development; Geographic Information Systems and Remote Sensing; Land Surface Processes; Earth Systems Science; and Environmental Management. Geography houses the Hirschfeld Geographic Information Centre, maintains the McGill High Arctic Research Station (Axel Heiburg Island, Nunavut Territory) and the McGill Sub-Arctic Research Station (Schefferville, Québec), and has strong ties with McGill's School of Environment and the Centre for Climate and Global Change Research. Faculty and students conduct research in fields as diverse as climate change impacts, periglacial geomorphology, and forest resource history in regions ranging from the Arctic to Southeast Asia and Latin America.

#### McGill Northern Research Stations

The McGill Sub-Arctic Research Station is located in Schefferville, in the centre of Quebec-Labrador. Facilities exist for research in most areas of physical and some areas of human geography in the subarctic.

McGill University also operates a field station at Expedition Fiord on Axel Heiberg Island in the High Arctic. Facilities are limited to a small lab, dorm building, and cookhouse. Research activities focus on the glacial and geological. For additional information on these stations, contact the Scientific Director, Wayne Pollard, Department of Geography.

**Centre for Climate and Global Change Research**

The Department of Geography, with the McGill Departments of Atmospheric and Oceanic Sciences, Economics, Natural Resource Sciences, and several departments from the



*section 11.6.11: Doctor of Philosophy (Ph.D.); Geography — Neotropical Environment*

The McGill-STRI Neotropical Environment Option (NEO) is a research-based option for Ph.D. students offered in association with several university departments, the McGill School of Environment, and the Smithsonian Tropical Research Institute (STRI-Panama) and includes the thesis; comprehensive examination; required (9) courses in Geography, Environment and Biology; and complementary (3) courses chosen from Geography, Agriculture Sciences, Biology, Sociology, Environment, and Political Science. NEO is aimed at students who wish to focus their graduate research on en

### Post-Retirement

S.H. Olson; M.A., Ph.D.(Johns Hop.)

### Professors

P.G. Brown; M.A., Ph.D.(Col.) (*joint appt. with McGill School of Environment*)

T.R. Moore; Ph.D.(Aberd.)

N.T. Roulet; M.Sc.(Trent), Ph.D.(McM.) (*James McGill Professor*)

G. Wenzel; M.A.(Manit.), Ph.D.(McG.)

### Associate Professors

G.L. Chmura; M.Sc.(Rhode Is.), Ph.D.(Louis. St.)

O.T. Coomes; M.A.(Tor.), Ph.D.(Wisc. Mad.)

B. Forest; A.B.(Chic.), Ph.D.(Calif.-LA)

M.F. Lapointe; M.Sc.(McG.), Ph.D.(Br. Col.)

T.C. Meredith; M.Sc., Dip.Cons.(Lond.), Ph.D.(Cant.)

W.H. Pollard; M.A.(Guelph), Ph.D.(Ott.)

N.A. Ross; M.A.(Qu.), Ph.D.(McM.)

R. Sieber; M.P.A.(W. Mich.), Ph.D.(Rutg.) (*joint appt. with McGill School of Environment*)

I.B. Strachan; B.Sc.(Tor.), M.Sc., Ph.D.(Qu.) (*cross appt. with Natural Resource Sciences*)

J. Unruh; M.S.(Wisc.), Ph.D.(Ariz.)

### Assistant Professors

L. Barrang-Ford; M.A.(Oxf.), Ph.D.(Guelph)

S. Breau; M.A.(Laval), Ph.D.(Calif.-LA)

J. Ford; Ph.D.(Guelph)

**Required Course (3 credits)**

GEOG 631	(3)	Methods of Geographical Research
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**Complementary Courses (12 credits)**

12 credits, four 3-credit courses at the 500 level or above selected according to guidelines of the Department. GEOG 696 can count among these complementary credits for students with an appropriate background.

**11.6.6 Master of Science (M.Sc.); Geography (Thesis) — Environment (45 credits)**

The Environment Option is offered in association with the McGill School of Environment and is composed of a thesis component (24 credits), required Geography and Environment courses (9 credits) and complementary Geography and Environment (12 credits) courses.

**Thesis Courses (24 credits)**

GEOG 697	(18)	Thesis Research (Environment Option)
GEOG 698	(6)	Thesis Proposal

**Required Courses (9 credits)**

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
GEOG 631	(3)	Methods of Geographical Research

**Complementary Courses (12 credits)**

9 credits of courses at the 500 level or higher selected according to guidelines of the Department. GEOG 696 can count among these complementary credits for students with an appropriate background.

3 credits, one course chosen from the following:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 580	(3)	Topics in Environment 3
ENVR 611	(3)	The Economy of Nature
ENVR 620	(3)	Environment and Health of Species
ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or another course at the 500 level or higher recommended by the advisory committee and approved by the Environment Option Committee.

**11.6.7 Master of Science (M.Sc.); Geography (Thesis) — Neotropical Environment (45 credits)**

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GEOG 699 (24) Thesis Research

#### Required Courses (9 credits)

BIOL 640 (3) Tropical Biology and Conservation  
 ENVR 610 (3) Foundations of Environmental Policy  
 GEOG 631 (3) Methods of Geographical Research

#### Complementary Course (3 credits)

3 credits, one Geography graduate course. GEOG 696 can count among these complementary credits for students with an appropriate background.

#### Elective Course (3 credits)

3 credits, at the 500 level or higher, on environmental issues to be chosen in consultation with and approval by the student's supervisor AND the Neotropical Environment Options Director.

### 11.6.8 Doctor of Philosophy (Ph.D.); Geography

The doctoral degree in Geography includes the successful completion of the comprehensive examination, a thesis based on original research and coursework chosen in collaboration with the student's supervisor and/or research committee. The main elements of the Ph.D. are the thesis and comprehensive examination, a required Methods of Geographical Research course (3 credits), and a minimum of two complementary courses (6 credits). The Ph.D. in Geography also includes several options.

#### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

#### Required Courses

GEOG 631 (3) Methods of Geographical Research  
 GEOG 700 (0) Comprehensive Examination 1  
 GEOG 701 (0) Comprehensive Examination 2  
 GEOG 702 (0) Comprehensive Examination 3

#### Complementary Courses

Two courses at the 500, 600, or 700 level selected according to guidelines of the Department.

### 11.6.9 Doctor of Philosophy (Ph.D.); Geography — Environment

The option consists of the thesis and comprehensive examination, required courses (9 credits) from Geography and Environment and complementary courses (9 credits) in Environment or other fields recommended by the research committee and approved by the Environment Option Committee.

#### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

#### Required Courses

ENVR 610 (3) Foundations of Environmental Policy  
 ENVR 650 (1) Environmental Seminar 1  
 ENVR 651 (1) Environmental Seminar 2  
 ENVR 652 (1) Environmental Seminar 3

GEOG 631 (3) Methods of Geographical Research

**Complementary Courses**

Two courses at the 500, 600, or 700 level selected according to guidelines of the Department.

One course chosen from the following:

Global En

### 11.6.11 Doctor of Philosophy (Ph.D.); Geography — Neotropical Environment

The Neotropical Option is offered in association with several University departments, the McGill School of Environment, and the Smithsonian Tropical Research Institute (STRI-Panama) and includes the thesis, comprehensive examination, required courses (9 credits) in Geography, Environment and Biology, and complementary courses (3 credits) chosen from Geography, Agriculture Sciences, Biology, Sociology, Environment, and Political Science.

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

#### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

#### Required Courses

BIOL 640	(3)	Tropical Biology and Conservation
ENVR 610	(3)	Foundations of Environmental Policy
GEOG 631	(3)	Methods of Geographical Research
GEOG 700	(0)	Comprehensive Examination 1
GEOG 701	(0)	Comprehensive Examination 2
GEOG 702	(0)	Comprehensive Examination 3

#### Elective Courses

3 credits, at the 500 level or higher, on environmental issues to be chosen in consultation with and approved by the student's supervisor AND the Neotropical Environment Options Director.

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## 11.7 Mathematics and Statistics

### 11.7.1 Location

Department of Mathematics and Statistics  
Burnside Hall, Room 1005  
805 Sherbrooke Street West  
Montreal, QC H3A 0B9  
Canada

Telephone: 514-3, QC H3A 0B9rem-ol075 263.hig5 Tm1 8.1 Tfl04.8.252ax14-3, QC H3A9j1 0 0 1 81.693 282.4212Tm(estEn.): 0 Tw 81.rgTw 81.RG1 821 Tfl C



**Master's Degree**

The normal entrance requirement for the master's programs is a Canadian honours degree or its equivalent, with high standing, in mathematics or a closely related discipline in the case of applicants intending to concentrate in statistics or applied mathematics.

Applicants wishing to concentrate in pure mathematics should have a strong background in linear algebra, abstract algebra, and real and complex analysis.

Applicants wishing to concentrate in statistics should have a strong background in linear algebra and basic real analysis.

## **Emeritus Professors**

Kohur N. GowriSankaran; B.A., M.A.(Madr.), Ph.D.(Bom.)

Joachim Lambek; M.Sc., Ph.D.(McG.), F.R.S.C. (*Peter Redpath Emeritus Professor of Pure Mathematics*)

Michael Makkai; M.A., Ph.D.(Bud.) (*Peter Redpath Professor of Pure Mathematics*)

Sherwin Maslo

### Associate Professors

Peter Bartello; B.Sc.(Tor.), M.Sc., Ph.D.(McG.) (*joint appt. with Atmospheric and Oceanic Sciences*)

Rustum Choksi; B.Sc.(Tor.) S.M., Ph.D.(Brown)

Antony R. Humphries; B.A., M.A.(Camb.), Ph.D.(Bath)

Wilbur Jonsson; M.Sc.(Manit.), Dr.Rer.Nat.(Tübingen)

Ivo Klemes; B.Sc.(Tor.), Ph.D.(Calif. Tech.)

James G. Loveys; B.A.(St. Mary's), M.Sc., Ph.D.(S. Fraser)

Neville G.F. Sancho; B.Sc., Ph.D.(Belf.)

Robert Seiringer; Dip, Ph.D.(Vienna)

Russell Steele; B.S., M.S.(Carn. Mell), Ph.D.(Wash.)

Alain Vandal; B.Sc., M.Sc.(McG.), Ph.D.(Auck.)

Adrian Vetta; B.Sc., M.Sc.(LSE), Ph.D.(MIT) (*joint appt. with Computer Science*)

### Associate Members

Xiao-Wen Chang (*Computer Science*)

Luc P. Devroye (*Computer Science*)

Pierre R.L. Dutilleul (*Plant Science*)

Eliot Fried (*Mechanical Engineering*)

Leon Glass (*Physiology*)

George Haller (*Engineering*)

James A. Hanley (*Epidemiology & Biostatistics*)

Lawrence Joseph (*Epidemiology & Biostatistics*)

Michael Mackey (*Physiology*)

Lawrence A. Mysak (*AOS*)

Christopher Paige (*Computer Science*)

Prakash Panangaden (*Computer Science*)

Robert Platt (*Epidemiology & Biostatistics*)

James O. Ramsay (*Psychology*)

George Alexander Whitmore (*Management*)

Christina Wolfson (*Epidemiolotics*)

**Faculty Lecturers**

José



MATH 601	(6)	Master's Thesis Research 2
MATH 604	(6)	Master's Thesis Research 3
MATH 605	(6)	Master's Thesis Research 4

**Required Course**

(1 credit)

MATH 669D1	(.5)	CSE Seminar
MATH 669D2	(.5)	CSE Seminar

**Complementary Courses (22 credits)**

(minimum 22 credits)

Two courses from List A, two courses from List B, and the remaining credits to be chosen from graduate (500- or 600-level) courses in the Department of Mathematics and Statistics. Two complementary courses must be taken outside the Department of Mathematics and Statistics.

**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 572	(3)	Computational Hydraulics
CIVE 603	(4)	Structural Dynamics
COMP 505	(3)	Advanced Computer Architecture
COMP 557	(3)	Fundamentals of Computer Graphics
COMP 558	(3)	Fundamentals of Computer Vision
COMP 567	(3)	Discrete Optimization 2
COMP 621	(4)	Program Analysis and Transformations
COMP 642	(4)	Numerical Estimation Methods
COMP 767	(4)	Advanced Topics: Applications 2
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
MATH 761	(4)	Topics in Applied Mathematics 1

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 572	(3)	Introduction to Robotics
MECH 573	(3)	Mechanics of Robotic Systems
MECH 576	(3)	Geometry in Mechanics
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)	Fundamentals of Heat Transfer
MECH 654	(4)	Compt. Fluid Flow and Heat Transfer

#### 11.7.8 Master of Science (M.Sc.); Mathematics and Statistics (Non-Thesis) (45 credits)

##### Research Project (16 credits)

MATH 640	(8)	Project 1
MATH 641	(8)	Project 2

##### Complementary Courses (29 credits)

At least eight approved graduate courses, at the 500, 600, or 700 level, of 3 or more credits each.

#### 11.7.9 Doctor of Philosophy (Ph.D.); Mathematics and Statistics

##### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

##### Required Courses

MATH 700	(0)	Ph.D. Preliminary Examination Part A
MATH 701	(0)	Ph.D. Preliminary Examination Part B

##### Complementary Courses

Twelve approved graduate courses, at the 500, 600, or 700 level, of 3 or more credits each.

**Doctor of Philosophy (Ph.D.); Mathematics and Statistics** ses (29 0 1 73.287 291.645 94(ses (29he )Tj/F4 8.1 Tf()Tj/F1 8.1 Tf(eld and must demonstrate

**Required Courses (3 credits)**

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
MATH 700	(0)	Ph.D. Preliminary Examination Part A
MATH 701	(0)	Ph.D. Preliminary Examination Part B

**Complementary Courses (6 credits)**

(3-6 credits)

The twelve one-semester complementary courses for the Ph.D. degree must include at least two from the list below, unless a student has completed the M.Sc.-level option in Bioinformatics, in which case only one course from the list below must be chosen:

BINF 621	(3)	Bioinformatics: Molecular Biology
BMDE 652	(3)	Bioinformatics: Proteomics
BTEC 555	(3)	Structural Bioinformatics
COMP 618	(3)	Bioinformatics: Functional Genomics
	(3)	Systems Biology and Biophysics

The Department of Physics currently guarantees financial support of \$21,400 per year for every graduate student. This minimum level of support can be supplemented by winning one of McGill's large number of in-house scholarships, worth up to \$25,000 per year. For details, see

This group studies nonlinear dynamical processes in the atmosphere and other geophysical systems, especially those associated with turbulent, chaotic, and extremely variable behaviour. Emphasis is placed on multifractal analysis and modelling as well as the development of new theories and techniques covering

**Director of Graduate Studies**

S. Jeon

**Emeritus Professors**S. Das Gupta; B.Sc., M.Sc.(Calc.), Ph.D.(McM.) (*Macdonald Emeritus Professor of Physics*)

N.B. DeTakaesy; B.Sc., M.Sc.(Montr.), Ph.D.(McG.)

C.S. Lam; B.Sc.(McG.), Ph.D.(MIT)

M.P. Langleben; B.Sc., M.Sc., Ph.D.(McG.), F.R.S.C.

S.K. Mark; B.Sc., M.Sc., Ph.D.(McG.) (*Macdonald Emeritus Professor of Physics*)D.G. Stairs; B.Sc., M.Sc.(Qu.), Ph.D.(Harv.) (*Macdonald Emeritus Professor of Physics*)

J.O. Strom-Olsen; B.A., M.S., Ph.D.(Camb.)

M.J. Zuckermann; M.A., D.Phil.(Oxf.), F.R.S.C.

**Post-Retirement Professors**

J. Barrette; M.Sc., Ph.D.(Montr.)

J.E. Crawford; B.A., M.A.(Tor.), Ph.D.(McG.)

R. Harris; B.A.(Oxf.), Ph.D.(Sus.)

J.K.P. Lee; B.Eng., M.Sc., Ph.D.(McG.)

R.B. Moore; B.Eng., M.Sc., Ph.D.(McG.)

P.M. Patel; B.Sc., M.Sc.(Manc.), Ph.D.(Harv.)

**Professors**J. Brandenberger; Dip.(ETH), A.M., Ph.D.(Harv.) (*Canada Research Chair*)

J. Cline; B.S.(Harvey Mudd), M.Sc., Ph.D.(Cal. Tech.)

F. Corriveau; B.Sc.(Laval), M.Sc.(Br. Col.), Ph.D.(ETH)

C. Gale; B.Sc.(Ott.), M.Sc., Ph.D.(McG.) (*James McGill Professor*)M. Grant; B.Sc.(PEI), M.Sc., Ph.D.(Tor.), F.R.S.C. (*James McGill Professor*)P. Grutter; Dip., Ph.D.(Basel), F.R.S.C. (*James McGill Professor*)H. Guo; B.Sc.(Sichuan), M.Sc., Ph.D.(Pitt.), F.R.S.C. (*James McGill Professor*)D. Hanna; B.Sc.(McG.), A.M., Ph.D.(Harv.) (*Macdonald Professor of Physics*)V. Kaspi; B.Sc.(McG.), M.A., Ph.D.(Princ.), F.R.S.C. (*Canada Research Chair*) (*Lorne Trottier Chair in Astrophysics and Cosmology*)

S. Lovejoy; B.Sc.(Camb.), Ph.D.(McG.)

N. Provas; Ph.D.(McG.)

K. Ragan; B.Sc.(Alta.), Ph.D.(Geneva) (*Macdonald Professor of Physics*)

D.H. Ryan; B.A., Ph.D.(Dub.)

M. Sutton; B.Sc., M.Sc., Ph.D.(Tor.) (*Rutherford Chair in Physics*)**Associate Professors**A. Clerk; B.Sc.(Tor.), Ph.D.(C' nell) (*Canada Research Chair*)

A. Cumming; B.A.(Camb.), Ph.D.(Calif., Berk.)

K. Dasgupta; M.Sc., Ph.D.(TIFR)

M. Dobbs; B.Sc.(McG.), Ph.D.(Vic., BC) (*Canada Research Chair*)

G. Gervais; B.Sc.(Sher.), M.Sc.(McM.), Ph.D.(N' western)

M. Hilke; B.Sc., M.Sc., Ph.D.(Geneva)

### Associate Professors

G. Holder; B.Sc., M.Sc.(Qu.), Ph.D.(Chic.) (*Canada Research Chair*)  
S. Jeon; B.Sc.(Seoul National), M.Sc., Ph.D.(Wash.)  
G. Moore; B.S.(Harvey Mudd), Ph.D.(Princ.)  
S. Robertson; B.Sc.(Calg.), M.Sc., Ph.D.(Vic., BC)  
R. Rutledge; B.Sc.(USC), Ph.D.(MIT)  
B. Vachon; B.Sc.(McG.), Ph.D.(Vic., BC) (*Canada Research Chair*)  
A. Warburton; B.Sc.(Vic., BC), M.Sc., Ph.D.(Tor.)  
P. Wiseman; B.Sc.(St. FX), Ph.D.(W. Ont.) (*joint appt. with Chemistry*)

### Assistant Professors

B. Coish; Ph.D.(Basel)  
D. Cooke; Ph.D.(Alta.)  
P. Francois; Ph.D.(Paris VII)  
S. Leslie; Ph.D.(Calif., Berk.)  
A. Maloney; B.S., M.S.(Stan.), Ph.D.(Harv.) (*William Dawson Scholar*)  
T. Pereg-Barnea; Ph.D.(Br. Col.)  
W. Reisner; B.A.(Reed), Ph.D.(Princ.)  
J. Sankey; Ph.D.(C'neil)  
B. Siwick; B.Sc., M.Sc., Ph.D.(Tor.) (*Canada Research Chair*) (*joint appt. with Chemistry*)  
J. Walcher; Dip., Ph.D.(ETH) (*joint appt. with Mathematics*)  
T. Webb; B.Sc.(Tor.), M.Sc.(McM.), Ph.D.(Tor.)

### Lecturers

Z. Altounian, F. Buchinger

### Associate Members

M. Chacron (*Physiology*)  
K. Gehring (*Biochemistry*)  
P. Hayden (*Computer Science*)  
M. Mackey (*Physiology*)  
Z. Mi (*Electrical and Computer Engineering*)  
J. Nadeau (*Biomedical Engineering*)  
E. Podgorsak (*Medical Physics*)  
D. Rassier (*Kinesiology*)  
D. Ronis (*Chemistry*)  
J. Seuntjens (*Medical Physics*)  
T. Szkopek (*Electrical and Computer Engineering*)  
F. Verhaegen (*Medical Physics*)

### Adjunct Professors

G. Austing, J. Cadogan, F. Drolet, M. Dubé, M. Grisaru, L. Piché, A. Sachrajda

### 11.8.5 Master of Science (M.Sc.); Physics (Thesis) (45 credits)

#### Thesis Courses (30 credits)

PHYS 690	(24)	M.Sc. Thesis
PHYS 692	(6)	Thesis Project

#### Complementary Courses (15 credits)

12 credits at the 500, 600, or 700 level.

3 credits at the 600 or 700 level:

Students with an appropriate background may request Departmental permission to substitute up to 6 credits chosen from the following courses:

PHYS 691	(3)	Thesis Preparation
PHYS 693	(3)	M.Sc. Research

Students must also successfully complete all the other normal requirements of Graduate and Postdoctoral Studies.

### 11.8.6 Doctor of Philosophy (Ph.D.); Physics

#### Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner.



M.A. and M.Sc. degrees may be awarded in Experimental Psychology, but only as a stage—students undergo formal evaluation in the Ph.D. program.

The Clinical program adheres to the scientist practitioner model and as such is designed to train students for careers in university teaching or clinical research, and for service careers (working with children or adults in hospital, clinical, or educational settings). Most of our clinical graduates combine service and research roles. While there are necessarily many more course requirements than in the Experimental program, the emphasis is again on research training. There is no master's program in Clinical Psychology; students are expected to complete the full program leading to a doctoral degree.

Research interests of members of the Psychology Department include animal learning, behavioural neuroscience, clinical, child development, cognitive science, health psychology, psychology of language, perception, quantitative psychology, social psychology, and personality psychology.

Facilities for advanced research in a variety of fields are available within the Department itself. In addition, arrangements exist with the Departments of Psychology at the Montreal Neurological Institute and Hospital, Allan Memorial Institute, Douglas Hospital, Jewish General Hospital, Montreal Children's Hospital, and the Montreal General Hospital, to permit graduate students to undertake research in a hospital setting.

For full information about all programs and financial aid, and for application forms, contact the Graduate Program Coordinator, Department of Psychology.

#### **Ph.D. Option in Language Acquisition (LAP)**

Information about this option is available from the Department and at: [www.psych.mcgill.ca/lap.html](http://www.psych.mcgill.ca/lap.html).

#### **Ph.D. Option in Psychosocial Oncology (PSO)**

A cross-disciplinary option in Psychosocial Oncology is offered within the existing Ph.D. program in Psychology. Information about this option is available from the Department and at: [www.medicine.mcgill.ca/oncology/programs/programs\\_psychosocialoncology.asp](http://www.medicine.mcgill.ca/oncology/programs/programs_psychosocialoncology.asp).

*Faculty of Arts > Graduate > Academic Programs > Psychology > : Master of Arts (M.A.); Psychology (Thesis) (45 credits)*

Candidates must demonstrate a sound knowledge of modern psychological theory, of its historical development, and of the logic of statistical methods as used in psychological research. Candidates will be expected to have an understanding of the main lines of current work in areas other than their own field of specialization.

*Faculty of Science*



## Professors

F.E. Aboud; B.A.(Tor.), M.A., Ph.D.(McG.)

M. Baldwin; B.A.(Tor.), M.A., Ph.D.(Wat.)

I.M. Binik; B.A.(NYU), M.A., Ph.D.(Penn.)

B. Ditto; B.S.(Iowa), Ph.D.(Ind.)

K.B.J. Franklin; B.A., M.A.(Auck.), Ph.D.(Lond.)

F.H. Genesee; B.A.(W. Ont.), M.A., Ph.D.(McG.)

R. Koestner; B.A., Ph.D.(Roch.)

D.J. Levitin; A.B.(Stan.), M.S., Ph.D.(Ore.) (*Bell Professor of Psychology and E-Commerce*)

J. Lydon; B.A.(Notre Dame), M.A., Ph.D.(Wat.)

J. Mogil; B.Sc.(Tor.), Ph.D.(Calif.-LA) (*E.P. Taylor Professor of Psychology*)

### **Assistant Professors**

J. Ristic; B.A., M.A., Ph.D.(Br. Col.)

H.-T. Yu; B.S.(Taiwan), M.S., M.A., Ph.D.(Ill.-Urbana-Champaign)

### **Lecturers**

R. Amsel, P. Carvajal

### **Associate Members**

*Anesthesia*: T. Coderre

*Douglas Hospital Rese9j 5.52 Tm(Douglas HospEih26(: sGE952 Tm(Douglah CentM.A., Ph.D.(Br0 1232 Tm(DouglaeTm(Anesthesia)Tj/F1 8.837 l2 Tm(Dougl: S. K*

**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Course (6 credits)**

PSYC 701	(6)	Doctoral Comprehensive Examination
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One graduate seminar each term during Year 2 and Year 3 chosen from seminar courses PSYC 710 to PSYC 758.

Note: The Department of Psychology does not ordinarily require an examination in a foreign language. However, all students planning on practising clinical psychology in the province of Quebec will be examined based on their proficiency in French before being admitted to the professional association.

Note: If the student has a non-McGill master's degree then the following courses are also required:

PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2
PSYC 660D1	(3)	Psychology Theory
PSYC 660D2	(3)	Psychology Theory

**11.9.7 Doctor of Philosophy (Ph.D.); Psychology — Language Acquisition**

Students must satisfy all program requirements for the Ph.D. in Psychology. The Ph.D. thesis must be on a topic relating to language acquisition, approved by the LAP committee.

**Thesis**

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous work in the field and must demonstrate ability to plan and carry out research, organize results, and defend the approach and conclusions in a scholarly manner. The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

**Required Courses (14 credits)**

EDSL 711	(2)	Language Acquisition Issues 3
LING 710	(2)	Language Acquisition Issues 2
PSYC 701	(6)	Doctoral Comprehensive Examination
PSYC 709	(2)	Language Acquisition Issues 1
SCSD 712	(2)	Language Acquisition Issues 4

One graduate seminar each term during Year 2 and Year 3 chosen from seminar courses PSYC 710 to PSYC 758.

Note: The Department of Psychology does not ordinarily require an examination in a foreign language however, all students planning on practising clinical psychology in the province of Quebec will be examined based on their proficiency in French before being admitted to the professional association.

Note: If the student has a non-McGill master's degree then the following courses are also required:

PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2
PSYC 660D1	(3)	Psychology Theory
PSYC 660D2	(3)	Psychology Theory

**Complementary Courses (9 credits)**

NUR2 783	(3)	Psychosocial Oncology Research
PSYC 701	(6)	Doctoral Comprehensive Examination

One graduate seminar each term during Year 2 and Year 3 chosen from seminar courses PSYC 710 to PSYC 758.

Note: The Department of Psychology does not ordinarily require an examination in a foreign language; however, all students planning on practising clinical psychology in the province of Quebec will be examined based on their proficiency in French before being admitted to the professional association.

Note: If the student has a non-McGill master's then the follo

### 11.10.3.2 Application Procedures