



**Faculty of Science, including School of Computer  
Science (Graduate)  
Programs, Courses and University Regulations  
2019-2020**



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This publication provides guidance to prospects, applicants, students, faculty and staff.

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## *Publication Information*

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## 1 **Dean's Welcome**

To Graduate Students and Postdoctoral Fellows:

Welcome to Graduate and Postdoctoral Studies (GPS) at McGill. You are joining a community of world-class researchers and more than 10,000 graduate  
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## 4 Graduate Studies at a Glance

Please refer to [University Regulations & Resources](#) > *Graduate* > : [Graduate Studies at a Glance](#) for a list of all graduate departments and degrees currently being offered.

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## 5 Program Requirements

Refer to [University Regulations & Resources](#) > *Graduate* > *Regulations* > : [Program Requirements](#) for graduate program requirements for the following:

- Master's Degrees
- Doctoral Degrees
- Coursework for Graduate Programs, Diplomas, and Certificates

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## 6 Graduate Admissions and Application Procedures

Please refer to [University Regulations & Resources](#) > *Graduate* > : [Graduate Admissions and Application Procedures](#) for information on:

- Application for Admission
- Admission Requirements
- Application Procedures
- Competency in English

and other important information regarding admissions and application procedures for Graduate and Postdoctoral Studies.

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## 7 Fellowships, Awards, and Assistantships

Please refer to [University Regulations & Resources](#) > *Graduate* > : [Fellowships, Awards, and Assistantships](#) for information and contact information regarding fellowships, awards, and assistantships in Graduate and Postdoctoral Studies.

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## 8 Postdoctoral Research

Students must inform themselves of University rules and regulations and keep abreast of any changes that may occur. The *Postdoctoral Research* section of this publication contains important details postdoctoral scholars will require during their studies at McGill and should be periodically consulted, along with other sections and related publications.

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### 8.1 Postdocs

Postdocs are recent graduates with a Ph.D. or equivalent (i.e., Medical Specialist Diploma) engaged by a member of the University's academic staff, including Adjunct Professors, to assist him/her in research.

Postdocs must be appointed by their department and registered with Enrolment Services in order to have access to University facilities (library, computer, etc.).

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## 8.2 Guidelines and Policy for Academic Units on Postdoctoral Education

The general guidelines listed below are meant to encourage units to examine their policies and procedures to support postdoctoral education. Every unit hosting Postdocs should have explicitly stated policies and procedures for the provision of postdoctoral education as well as established means for informing Postdocs of policies, procedures, and privileges (e.g., orientation sessions, handbooks, etc.), as well as mechanisms for addressing complaints. Academic units should ensure that their policies, procedures and privileges are consistent with these guidelines and the Charter of Students' Rights. For their part, Postdocs are responsible for informing themselves of policies, procedures, and privileges.

### 1. Definition and Status

i. Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations. Persons may only be registered with postdoctoral status for a period of up to five years from the date they were awarded a Ph.D. or equivalent degree. Time allocated to parental or health leave is added to this period of time. Leaves for other reasons, including vacation leave, do not extend the term. Postdocs must do research under the supervision of a McGill professor, including Adjunct Professors, who is a member of McGill's academic staff qualified in the discipline in which training is being provided and with the abilities to fulfil responsibilities as a supervisor of the research and as a mentor for career development. They are expected to be engaged primarily in research with minimal teaching or other responsibilities.

### 2. Registration

i. Postdocs must be registered annually with the University through Enrolment Services. Initial registration will require an original or notarized copy of the Ph.D. diploma. Registration will be limited to persons who fulfil the definition above and for whom there is an assurance of appropriate funding and where the unit can provide assurance of the necessary resources to permit postdoctoral education.

ii. Upon registration, the Postdoc will be eligible for a University identity card issued by Enrolment Services.

### 3. Appointment, Pay, Agreement of Conditions

i. Appointments may not exceed your registration eligibility status.

ii. In order to be registered as a Postdoc, you must be assured of financial support other than from personal means during your stay at McGill University, equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies. There are no provisions for paid parental leave unless this is stipulated in the regulations of a funding agency outside the University.

iii. At the outset of a postdoctoral appointment, a written Letter of Agreement for Postdoctoral Education should be drawn up and signed by the Postdoc, the supervisor, and the department head or delegate (see template Letter of Agreement and supporting document—[Commitments of Postdoctor](#)

x. Access to student services and athletic services are available to the Postdoc on an opt-in basis. Fees are applicable.

## **5. Responsibilities**

i. Postdocs are subject to the responsibilities outlined at [www.mcgill.ca/students/srr](http://www.mcgill.ca/students/srr) and must abide by the policies listed at [www.mcgill.ca/secretariat/policies-and-regulations](http://www.mcgill.ca/secretariat/policies-and-regulations).

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:

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department shall forw

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## 10 Graduate Student Services and Information

Graduate students are encouraged to refer to : [Student Services and Information](#) for information on the following topics:

- Service Point
- Student Rights & Responsibilities
- Student Services – Downtown & Macdonald Campuses
- Residential Facilities
- Athletics and Recreation
- Ombudsperson for Students
- Extra-Curricular and Co-Curricular Activities
- Bookstore
- Computer Store
- Day Care

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

Refer to [University Regulations & Resources](#) > Graduate > : [Research Policy and Guidelines](#) for information on the following:

- Regulations on Research Policy
- Regulations Concerning the Investigation of Research Misconduct
- Requirements for Research Involving Human Participants
- Policy on the Study and Care of Animals
- Policy on Intellectual Property
- Regulations Governing Conflicts of Interest
- Safety in Field Work
- Office of Sponsored Research
- Postdocs
- Research Associates

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## 12 Browse Academic Units & Programs

The programs and courses in the following sections have been approved for the 2019–2020 session as listed. The Faculty/School reserves the right to introduce changes as may be deemed necessary or desirable at any time throughout the year.

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### 12.1 Atmospheric and Oceanic Sciences

#### 12.1.1 Location

Department of Atmospheric and Oceanic Sciences  
Burnside Hall  
805 Sherbrooke Street West, Room 945  
Montreal QC H3A 0B9  
Canada  
Telephone: 514-398-3764  
Fax: 514-398-6115

Email: [info.aos@mcgill.ca](mailto:info.aos@mcgill.ca); graduate studies: [graduateinfo.aos@mcgill.ca](mailto:graduateinfo.aos@mcgill.ca)  
Website: [www.mcgill.ca/meteo](http://www.mcgill.ca/meteo)

### 12.1.2 About Atmospheric and Oceanic Sciences

The Department of Atmospheric and Oceanic Sciences offers courses and research opportunities in atmospheric sciences and physical oceanography leading to the **M.Sc.** and **Ph.D.** degrees. Research programs borrow from fundamental fields such as mathematics, statistics, physics, chemistry, and computing to address a broad range of topics relating to weather and climate. Examples include:

- atmospheric chemistry;
- climate dynamics;
- cloud and precipitation physics;
- dynamical oceanography and meteorology;
- geophysical turbulence;
- numerical modelling;
- numerical weather prediction;
- ocean carbon budgets;
- sea ice dynamics;
- synoptic, mesoscale, and radar and satellite meteorology.

Some faculty members have close ties with other departments, schools, and centres, including the Chemistry, and Mathematics and Statistics Departments; the *McGill School of Environment*; *ArcticNet*; and *Quebec Ocean*. Facilities include the J. Stewart Marshall Radar Observatory, as well as state-of-the-art field and laboratory equipment for atmospheric chemistry. Graduate students have access to computers, ranging from desktop PCs to the massive parallel machines available to us through Compute 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 12.1.5: 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 of

### **12.1.3 Atmospheric and Oceanic Sciences Admission Requirements and Application Procedures**

#### **12.1.3.1 Admission Requirements**

### **Emeritus Professors**

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

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

### **Professors**

P. Ariya; B.Sc., Ph.D.(York) (*James McGill Professor*) (*joint appt. with Chemistry*)

P. Bartello; B.S.c., M.Sc., Ph.D.(McG.)

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

M.K. Yau; S.B., S.M., Sc.D.(MIT) (*NSERC/Hydro-Québec Industrial Research Chair in Short-term Forecasting of Precipitation*)

### **Associate Professors**

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

Y. Huang; B.Sc., M.Sc.(Peking), Ph.D.(Princ.)

D. Kirshbaum; B.Sc.(Ill.), M.Sc.(Johns Hop.), Ph.D.(Wash.)

T. Merlis; B.Sc.(Col.), Ph.D.(Calif. Tech.)

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

B. Tremblay; B.Sc., M.Sc.(Car.), Ph.D.(McG.)

### **Assistant Professors**

C. e9.Sc., M.Sc.2M.ScEler2 459.04 Tm(C. e9.Sc)Tj1 0 0 1 15TV.Sc., Ph.D.(M1 08 0 1 15TV.Scr9.597 574.08 Tm(onment)Tj6hanceash.)

ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
ATOC 519*	(3)	Advances in Chemistry of Atmosphere
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 548	(3)	Mesoscale Meteorology.
ATOC 568	(3)	Ocean Physics
ATOC 626	(3)	Atmospheric/Oceanic Remote Sensing
ATOC 646	()	
CHEM 519*	(3)	Advances in Chemistry of Atmosphere

\* Students may select either ATOC 519 or CHEM 519.

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.

### 12.1.6 Master of Science (M.Sc.) Atmospheric and Oceanic Sciences (Thesis): Environment (45 credits)

\*\* This program is currently not offered \*\*

#### 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

Although registration is not required, students registered in M.Sc. programs are expected to regularly attend one of 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 519*	(3)	Advances in Chemistry of Atmosphere
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 626	(3)	Atmospheric/Oceanic Remote Sensing
ATOC 646	(3)	Mesoscale Meteorology
CHEM 519*	(3)	Advances in Chemistry of Atmosphere

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

\* Students may select either ATOC 519 or CHEM 519.

3 credits of MSE courses chosen from the following:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
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.

### 12.1.7 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.

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## 12.2 Biology

### 12.2.1 Location

Department of Biology  
Stewart Biological Sciences Building, Room N7/18B  
1205 Dr. Penfield Avenue  
Montreal QC H3A 1B1  
Canada  
Telephone: 514-398-5478  
Fax: 514-398-5069  
Email: [ancil.gittens@mcgill.ca](mailto:ancil.gittens@mcgill.ca)  
Website: [biology.mcgill.ca](http://biology.mcgill.ca)

### 12.2.2 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
- Plant Biology

In addition to the regular **M.Sc.** and **Ph.D.** programs, the Biology Department offers specialized programs, known as “concentrations”, in the areas of Neotropical Environment (NEO), Bioinformatics, and Environment.

Both the M.Sc. and Ph.D. are research-intensive degrees, and the emphasis in both programs is on developing the intellectual and technical skills necessary for independent research. The main component of both degrees is a thesis presenting the results of this work in the form of a student’s original contribution to scientific knowledge. Formal coursework, usually in the form of literature-based seminar courses, is minimal and typically completed within the first year. To complement their classroom and laboratory training, students regularly attend other seminar series and journal clubs and present their own work annually in a formal seminar.

In addition to working with world-class researchers, graduate students in Biology have access to top-notch research infrastructure. The recently renovated Stewart Biology Building and the newly constructed Bellini Life Sciences Complex are equipped with state-of-the-art equipment and facilities for sophisticated imaging, robotic, and genetic techniques, to name a few. These in-house capabilities are complemented by a wide range of field research facilities, which include:

- [Gault Nature Reserve](#) at Mont St. Hilaire (Quebec);
- [Morgan Arboretum](#) (Quebec);
- [Huntsman Marine Science Centre](#) (New Brunswick);
- [Subarctic Research Station](#) (Quebec);
- [Bellairs Research Institute](#) (Barbados);
- [Smithsonian Tropical Research Institute](#) (Panama);
- Limnology research station at the

**section 12.2.5: Master of Science (M.Sc.) Biology (Thesis) (45 credits)**

The typical graduate student in this program has a strong background knowledge in cell and molecular biology, biochemistry, organismal biology, ecology, developmental biology, and statistics, often with special strengths in the area of proposed study. Given the continuing trend toward interdisciplinary work, the program also accepts some students with a high scholastic standing who have completed a program in fields other than biology (medicine, engineering, chemistry, physics, etc.).

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, pursuing careers as wildlife biologists, forensic technologists, or science policy advisers, to name a few.

**section 12.2.8: Master of Science (M.Sc.) Biology (Thesis): Bioinformatics (48 credits)**

The goal of the Bioinformatics concentration 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 concentration 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 concentration. Students in this concentration will have access to five specialized courses that are open only to students within the Bioinformatics concentration. At the M.Sc. level, students successfully completing the Bioinformatics concentration will be fluent in the concepts, language, approaches, and limitations of the field.

**section 12.2.6: Master of Science (M.Sc.) Biology (Thesis): Environment (48 credits)**

The Environment graduate concentration 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 concentration 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 concentration 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 concentration 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 12.2.7: 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 concentration 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 12.2.9: Doctor of Philosophy (Ph.D.) Biology**

The typical graduate student in this program has a strong background knowledge in cell and molecular biology, biochemistry, organismal biology, ecology, developmental biology, and statistics, often with special strengths in the area of proposed study. Given the continuing trend toward interdisciplinary work, the program also accepts some students with a high scholastic standing who have completed a program in fields other than biology (medicine, engineering, chemistry, physics, etc.).

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, pursuing careers as wildlife biologists, forensic technologists, or science policy advisers, to name a few.

**section 12.2.12: Doctor of Philosophy (Ph.D.) Biology: Bioinformatics**

The goal of the Bioinformatics concentration 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.

*section 12.2.12: Doctor of Philosophy (Ph.D.) Biology: Bioinformatics*

The Bioinformatics graduate concentration 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 concentration. Students in this concentration will have access to five specialized courses that are open only to students within the Bioinformatics concentration. At the Ph.D. level students will be fluent in the concepts, language, approaches, and limitations of the field and will also have the capability of dev

### 12.2.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Biology Department and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.mcgill.ca/gps/contact/graduate-program).

Application Opening Dates		Application Deadlines		
		All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)
<b>Fall Term:</b>	Sept. 15	Jan. 15	March 15	March 15
<b>Winter Term:</b>	Feb. 15	Aug. 15	Oct. 15	Oct. 15
<b>Summer Term:</b>	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit. All inquiries pertaining to admission procedures should be directed to the [Graduate Admissions Secretary](#).



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

### 12.2.4 Biology Faculty

#### Chair

Gregor Fussmann

#### Graduate Program Director

Frédéric Guichard

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)

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

Rona Poole (y; B.Sc., Ph.D.(Ind.))

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

Donald L. Kramer; B.Sc.(Bosat an; M265.i49.gcrarv

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Gregor Fussm; rampaIn(Berlinan.), Ph.D.ax Plancknd.)RGcm1 0 0 1-4 3193 0 8 440.523193 0 8 440.523193 m8 1569.523193 18 1569.523693 188 440.523693 18 lh gBT 0 18.1 Tf1 0 0

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## Professors

Andrew Gonzalez; B.Sc.(Nott.), Ph.D.(Imperial Coll., Lond.) (*Canada Research Chair in Biodiversity Science*)

Fr

### **Assistant Professors**

Stephanie C. Weber; B.Sc.(Duke), Ph.D.(Stan.)

### **Associate Members**

*BioEngineering:* Adam Hendricks

*Biochemistry: Biochemistry:* Maxime Bouchard

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

*Environment:* Colin Chapman

*Glen site:* Hugh J. Clarke, Daniel Dufort, Teruko Taketo

*MCH:* Rima Rozen

*Medical Genetics, Chair:* David Rosenblatt

*MNI:* Kenneth Hastings  
f0 G0 gBT/F3 8.1 Tf1 0mDF2 8.1 Tf1 0 On Chapman

**Complementary Courses (3 credits)**

3 credits, one of the following courses:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
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 level or higher recommended by the Advisory Committee and approved by the Environment Option Committee.

**12.2.7 Master of Science (M.Sc.) Biology (Thesis): Neotropical Environment (48 credits)**

Participation in the MSE-P11 0 0 1 70.52 607.421Tj.123ster BIOL .02 0 1 221.949 607.4214623.03ster of Sci's 0 1 255.924 50.93214623.03ster 0:11 0 0 1 70.52 607.4

### 12.2.9 Doctor of Philosophy (Ph.D.) 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 (6 credits)

BIOL 700	(0)	Doctoral Qualifying Examination
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.

### 12.2.10 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)

(0)	Doctoral Qualifying Examination
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A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to kno

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

### 12.3.2 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](#).

#### Analytical/Environmental

The Analytical/Environmental Thematic Research Group at McGill is involved in 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; thermochemical, box, and cloud modelling; and state-of-the-art atmospheric kinetics and photochemistry; 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 Research 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 Research 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 bioph

**section 12.3.6: Doctor of Philosophy (Ph.D.) Chemistry**

Please consult the Department for more information about this program.

**12.3.3 Chemistry Admission Requirements and Application Procedures****12.3.3.1 Admission Requirements**

The minimum academic standard for admission to research thesis degree programs is a minimum standing equivalent to a cumulative grade point average (CGPA) of 3.0 out of a possible 4.0 or a GPA of 3.2/4.0 for the last two full-time academic years. Applicants from other institutions should have an academic background equivalent to that of a McGill graduate in the Chemistry Honours/Major programs. If possible, candidates should specify the field of research in which they are interested.

**12.3.3.2 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).

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

**FINANCIAL ASSISTANCE****M.Sc. and Ph.D. Degrees**

Graduate students devote 12 hours per week (contact hours, plus grading of reports, etc.) during the academic session to their teaching duties. Financial assistance during the remainder of the year is provided from research funds. Scholarship holders, such as NSERC or awards of similar value, receive a tuition fee waiver.

**12.3.3.2.1 Additional Requirements**

- GRE – may be required for international degrees

**12.3.3.3 Application Dates and Deadlines**

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Chemistry and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.mcgill.ca/gps/contact/graduate-program).

		Application Opening Dates		Application Deadlines	
		All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
<b>Fall Term:</b>	Sept. 15	April 30	June 15	June 15	
<b>Winter Term:</b>	Feb. 15	Aug. 31	Oct. 31	Oct. 31	
<b>Summer Term:</b>	N/A	N/A	N/A	N/A	

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.



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

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

**12.3.4 Chemistry Faculty****Chair**

D. Perepichka

**Director of Graduate Studies**

G. Cosa

**Emeritus Professors**

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

**Assistant Professors**

M. Harrington; B.A.(Delaware), Ph.D.(Calif., Santa Barbara)

CHEM 701	(0)	Comprehensive Examination
CHEM 702	(0)	Progress Assessment 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.

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## **12.4 Computer Science**

### **12.4.1 Location**

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

*section 12.4.8: Doctor of Philosophy (Ph.D.) Computer Science*

The Ph.D. program trains students to become strong, independent researchers in the field of their choice. Our graduates take challenging positions in industry or take academic positions at universities and research labs. In order to apply to the Ph.D. program, applicants should normally hold a master's degree in Computer Science or a closely related area, from a well-recognized university, but exceptional students can be admitted to the Ph.D. program directly without a master's degree.

*section 12.4.9: Doctor of Philosophy (Ph.D.) Computer Science: Bioinformatics*

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This 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.

**12.4.3 Computer Science Admission Requirements and Application Procedures**

**12.4.3.1 Admission Requirements**

**Master's (M.Sc.)**

The minimum requirement for admission is a bachelor's degree (cumulative grade point average (CGPA) of 3.2 out of 4.0 or better, or equivalent) with the coursework in Computer Science as listed on our [website](#).

The website supplements the information in this publication, and should be consulted by all graduate students.

**Ph.D.**

In order to apply to the Ph.D. program, applicants should hold an M.Sc. degree in Computer Science or a closely related area, from a well-recognized university. Students who hold a B.Sc. degree in Computer Science but have an exceptionally strong academic record may be admitted directly to the Ph.D. program, but they must initially apply to the M.Sc. program. Students who are in the M.Sc. program have the option to be fast-tracked into the Ph.D. program at the end of their first academic year, contingent on excellent performance as judged by the Ph.D. committee.

**12.4.3.2 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).

See [University Regulations & Resources](#) > Graduate > Graduate Admissions and Application Procedures > : [Application Procedures](#) for detailed application procedures.

**12.4.3.2.1 Additional Requirements**

The items and clarifications below are additional requirements set by this department:

- Curriculum Vitae – required for both M.Sc. and Ph.D. programs
- Statement of Purpose – required for both M.Sc. and Ph.D. programs
- [Graduate Record Examination](#) (GRE General Test) – required for degrees from outside Canada. Optional for Ph.D. program.

For further details, consult the [School of Computer Science's website](#)

**12.4.3.3 Application Dates and Deadlines**

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the School of Computer Science and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.mcgill.ca/gps/contact/graduate-program).

Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
<b>Fall Term:</b>	Sept. 15	March 1	March 1	March 1
<b>Winter Term:</b> (*Ph.D. only)	Feb. 15*	Sept. 1*	Sept. 1*	Sept. 1*
<b>Summer Term:</b>	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

For further details on our admission requirements, please visit our website at [www.cs.mcgill.ca/academic/gr](http://www.cs.mcgill.ca/academic/gr)

**Associate Professors**

E. Patitsas; B.Sc.(Br. Col.), M.Sc., Ph.D.(Tor.)  
 B. Pientka; B.Sc., M.Sc.(Tech. U. of Darmstadt, Germany), Ph.D.(Carn. Mell)  
 J. Pineau; B.Sc.(Wat.), M.Sc., Ph.D.(Carn. Mell) (*William Dawson Scholar*)  
 D. Precup; B.Sc.(Tech. U. of Cluj-Napoca), M.Sc., Ph.D.(Mass.)  
 R. Rabbany; B.Sc.(Amirkabir University of Technology, Iran), M.Sc., Ph.D.(Alta.)  
 D. Ruths; B.Sc., M.Sc., Ph.D.(Rice)  
 C. Verbrugge; B.A.(Qu.), Ph.D.(McG.)  
 A. Vetta; B.Sc., M.Sc.(LSE), Ph.D.(MIT)  
 J. Waldispuhl; B.Sc.(Nice Sophia Antipolis), M.Sc.(Paris VII), Ph.D.(École Poly., France)

**Assistant Professors**

Y. Cai; B.S.(Peking), M.S., Ph.D.(MIT) (*William Dawson Scholar*)  
 J. Cheung; B.Sc.(Br. Col.), M.Sc., Ph.D.(Tor.)  
 D. Meger; B.Sc.(Br. Col.), M.Sc.(McG.), Ph.D.(Br. Col.)

**Faculty Lecturer**

G. Alberini; B.Sc., M.Sc.(Universita degli Studi di Padova, Italy), Ph.D.(McG.)  
 J. Vybihal; B.Sc., M.Sc.(McG.)

**Associate Members**

D. Schlimm (*Philosophy*)  
 T.R. Shultz (*Psychology*)

**Adjunct Professors**

A. Baretto, P.J. Mosterman, T. Perkins, I. Rekleitis, G.O. Sabidussi

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

22 credits selected from:

COMP 691	(3)	Thesis Research 1
COMP 696	(3)	Thesis Research 2
COMP 697	(4)	Thesis Research 3
COMP 698	(10)	Thesis Research 4
COMP 699	(12)	Thesis Research 5

**Required Course**

COMP 601	(2)	Thesis Literature Review
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**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.

#### 12.4.6 Master of Science (M.Sc.) Computer Science (Thesis): Bioinformatics (45 credits)

##### Thesis Courses (24 credits)

22 credits selected from:

COMP 691	(3)	Thesis Research 1
COMP 696	(3)	Thesis Research 2
COMP 697	(4)	Thesis Research 3
COMP 698	(10)	Thesis Research 4
COMP 699	(12)	Thesis Research 5

##### Required Courses (3 credits)

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

##### Required Course

COMP 601	(2)	Thesis Literature Review
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##### 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.

#### 12.4.7 Master of Science (M.Sc.) Computer Science (Non-Thesis) (45 credits)

##### Research Project (15 credits)

15 credits selected as follows:

COMP 693	(3)	Research Project 1
COMP 694	(6)	Research Project 2
COMP 695	(6)	Research Project 3

##### Complementary Courses (30 credits)

30 credits (nine courses), of which 12 credits must be of 4-credit courses at the 500, 600, or 700 level of COMP courses.

#### 12.4.8 Doctor of Philosophy (Ph.D.) Computer Science

Required coursework: Students must take eight graduate courses, of which at least five

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 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)	Advanced Computational Biology Methods and Research
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 627	(4)	Theoretical Programming Languages
COMP 642	(4)	Numerical Estimation Methods
COMP 647	(4)	Advanced Cryptography
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

## Software Architecture

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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**12.5 Earth and Planetary Sciences****12.5.1 Location**

Applying physics to study the interactions between the solid Earth, ice, ocean, and climate systems; numerical modelling, analysis, and interpretation of paleo and modern sea-level changes, solid earth deformation and glacial isostatic adjustment, and ice in the Earth and climate systems.

### **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.

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

Sedimentology, stratigraphy, and isotope geochemistry as guides to reconstructing ancient environments. Reconstruction of Proterozoic paleogeographies and the origin and evolution of Proterozoic sedimentary basins. Documenting and interpreting paleoenvironmental change during the Proterozoic. Relationships between tectonics (i.e., supercontinental break-up and assembly), seawater chemistry and ocean redox, and climate change. Calibrating the diversification of early eukaryotes and their impact on global biogeochemical cycles.

### **Mineralogy**

Chemistry and crystallography of carbonate and a variety of rock-forming and biogenic minerals; experimental investigations of the effect of environmental factors (e.g., solution composition and temperature) on the morphology and composition of carbonate and phosphate minerals.

### **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 and Structural Geology**

Digital field mapping, microstructural characterization, and mineralogical analyses of deformation structure kinematics, geometry, and deformation processes; Archean orogenic processes; structural controls on ore deposit genesis; fluid flow in faults, granular flow in faults, and catastrophic structural/geochemical events in faults; earthquake mechanics and processes recorded in rocks; brittle-ductile transition structures and rheology.

### **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. [Sub1 0 .5entologyM.Sc.peroth the EaP36 TmsediScin](#)



### section 12.5.8: Doctor of Philosophy (Ph.D.) Earth and Planetary Sciences: Environment

The graduate option in Environment provides students with an appreciation for the role of science in informed decision-making in the environmental sector, and its influence on 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 that have been admitted through their home department or faculty may apply for admission to the option. Option requirements are consistent across academic units. The option is coordinated by the *McGill School of Environment* (MSE), in partnership with participating academic units.

## 12.5.3 Earth and Planetary Sciences Admission Requirements and Application Procedures

### 12.5.3.1 Admission Requirements

Applicants should have an academic background equivalent to that of a McGill graduate in the Honours or Majors program in geology, geophysics, chemistry, or physics (minimum CGPA of 3.0 out of 4.0). The Admissions Committee may modify the requirements in keeping with the field of graduate study proposed. In some cases, a Qualifying year may be required.

### 12.5.3.2 Application Procedures

Students should first *contact potential supervisors* within the Department of Earth and Planetary Sciences and assess their interest in accepting new students before starting the formal application procedure. General inquiries concerning the Department should be addressed to Graduate Admissions, Department of Earth and Planetary Sciences at [grad.eps@mcgill.ca](mailto:grad.eps@mcgill.ca). Candidates should indicate their field(s) of interest when making formal applications for admission.

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

See *University Regulations & Resources* > Graduate > Graduate Admissions and Application Procedures > : *Application Procedures* for detailed application procedures.

### 12.5.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Earth and Planetary Sciences and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.mcgill.ca/gps/contact/graduate-program).

Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
<b>Fall Term:</b>	Sept. 15	Feb. 1	Feb. 1	Feb. 1
<b>Winter Term:</b>	Feb. 15	Sept. 1	Sept. 1	Sept. 1
<b>Summer Term:</b>	N/A	N/A	N/A	N/A

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

## 12.5.4 Earth and Planetary Sciences Faculty

### Chair

Jeffrey McKenzie

### Emeritus Professors

Jafar Arkani-Hamed; B.Eng.(Tehran), Ph.D.(MIT)

Donald Francis; B.Sc.(McG.), M.Sc.(Br. Col.), Ph.D.(MIT)

Reinhard Hesse; D.Sc., Ph.D. (Tech. Munich)

Andrew J. Hynes; B.Sc.(Tor.), Ph.D.(Cant.)

Robert F. Martin; B.Sc.(Ott.), M.S.(Penn. St.), Ph.D.(Stan.)

Colin W. Stearn; B.Sc.(McM.), M.S., Ph.D.(Yale), F.R.S.C.

**Professors**

Don Baker; A.B.(Chic.), Ph.D.(Penn. St.)

Olivia G. Jensen; B.Sc., M.Sc., Ph.D.(Br. Col.)

Alfonso Mucci; B.Sc., M.Sc.(Montr.), Ph.D.(Miami)

John Stix; A.B.(Dart.), M.Sc., Ph.D.(Tor.)

A.E. (Willy) Williams-Jones; B.Sc., M.Sc.(Natal), Ph.D.(Qu.) (*William E. Logan Professor of Geology*)

**Associate Professors**

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

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

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

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

Christie Rowe; A.B.(Smith), Ph.D.(Calif.-Santa Cruz) (*Robert Wares Faculty Scholar*)

Vincent van Hinsberg; Propadeuse, Doctorandus(Utrecht), Ph.D.(Brist.) (*Osisko Faculty Scholar*)

**Assistant Professors**

Kim Berlo; Propadeuse, Doctorandus(Utrecht), Ph.D.(Brist.)

Nicolas Cowan; B.Sc.(McG.), Ph.D.(Wash.) (*joint appt. with Physics*)

Peter Douglas; B.Sc., Ph.D.(Yale)

Natalya Gomez; B.Sc., M.Sc.(Tor.), Ph.D.(Harv.)

James Kirkpatrick; B.Sc., M.Sc.(Leeds), Ph.D.(Glas.)

Nagissa Mahmoudi; B.Sc.(Tor.), Ph.D.(McM.)

**Faculty Lecturer**

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

**Adjunct Professors**

R. Léveillé, B. Sundby

**12.5.5 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

**Complementary Courses (12 credits)**

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

**12.5.6 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 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.

**12.5.7 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. degr482dde

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 700	(0)	Preliminary Doctoral Examination

### Complementary Courses

\* Two to six courses (6-18 credits)

One course chosen from the following courses:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
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.

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

## 12.6 Geography

### 12.6.1 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.mcgill.ca/geography](http://www.mcgill.ca/geography)

### 12.6.2 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 Development;
- Geographic Information Systems and Remote Sensing;
- Land Surface Processes, Ecosystem Biogeochemistry, and Ecohydrology;
- Earth System Science and Global Change;
- Sustainability Science and Environmental Management.

Geography houses McGill's Hitschfield Geographic Information Centre, maintains the *McGill Arctic Research Station* (Axel Heiburg Island, Nunavut Territory) and the *McGill Sub-Arctic Research Station* (Schefferville, Quebec), and has strong ties with McGill's *School of Environment*. F

Being both a natural and a social science, geography pro

**section 12.6.5: Master of Science (M.Sc.) Geography (Thesis) (45 credits)**

Master's degrees in both the physical (M.Sc.) and social (M.A.) sciences are offered by Geography. The core of both programs for all students is field-based research, supervised by a faculty member, culminating in a thesis. The core program consists of the thesis component, required, and complementary graduate (500- or 600-level) courses. Geography also offers a number of M.A. and M.Sc. options in association with other McGill departments and programs that students may choose to follow.

**section 12.6.6: Master of Science (M.Sc.) Geography (Thesis): Environment (45 credits)**

The Environment option is offered in association with the *McGill School of Environment* (MSE) and is composed of a thesis component; required Geography and Environment courses; and complementary Geography and Environment courses. The graduate option in Environment provides students with an appreciation for the role of science in informed decision-making in the environmental sector, and its influence on political, socio-economic, and ethical judgments. Students who have been admitted through their home department or Faculty may apply for admission to the option. Option requirements are consistent across academic units. The option is coordinated by the MSE, in partnership with participating academic units.

**section 12.6.7: Master of Science (M.Sc.) Geography (Thesis): Neotropical Environment (45 credits)**

The McGill-STRI Neotropical Environment Option (NEO) is a research-based option for master's students offered in association with several university departments, the *McGill School of Environment*, and the *Smithsonian Tropical Research Institute* (STRI-Panama). The option includes a thesis; required courses in Geography, Environment, and Biology; and complementary 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 environmental issues relevant to the Neotropics and Latin American countries. NEO favours interdisciplinary approaches to research and learning through the participation of researchers from McGill and from STRI. Students will complete their research in Latin America and NEO's core and complementary courses will be taught in Panama. NEO's educational approach seeks to facilitate a broader understanding of tropical environmental issues and the development of skills relevant to working in the tropics.

**Ph.D. Programs in Geography****: 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, and a minimum of two complementary courses.

**: Doctor of Philosophy (Ph.D.) Geography: Environment**

The Environment option consists of the thesis and comprehensive examination; required courses from Geography and Environment; and complementary courses in Environment or other fields recommended by the research committee and approved by the Environment Option Committee. The graduate option in Environment provides students with an appreciation for the role of science in informed decision-making in the environmental sector, and its influence on political, socio-economic, and ethical judgments. Students who have been admitted through their home department or faculty may apply for admission to the option. Option requirements are consistent across academic units. The option is coordinated by the *McGill School of Environment*, in partnership with participating academic units.

**: Doctor of Philosophy (Ph.D.) Geography: Gender and Women's Studies**

This doctoral option is an interdisciplinary program for students who meet the degree requirements in Geography and who wish to earn 9 credits of approved coursework on gender and women's studies and issues in feminist research and methods. It includes a thesis centrally related to gender and/or women's studies; the comprehensive examination; required courses in Geography and Women's Studies; and complementary courses, one of which must pertain to gender and/or women's issues.

**: 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 courses in Geography, Environment, and Biology; and complementary 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 environmental issues relevant to the Neotropics and Latin American countries. NEO favours interdisciplinary approaches to research and learning through the participation of researchers from McGill and from STRI. Students will complete their research in Latin America and NEO's core and complementary courses will be taught in Panama. NEO's educational approach seeks to facilitate a broader understanding of tropical environmental issues and the development of skills relevant to working in the tropics.

## 12.6.3 Geography Admission Requirements and Application Procedures

### 12.6.3.1 Admission Requirements

#### M.A. and M.Sc. Degrees

Applicants not satisfying the conditions in [University Regulations & Resources > Graduate > : Graduate Admissions and Application Procedures](#), but with primary undergraduate specialization in a cognate field, may be admitted to the M.A. or M.Sc. degree in Geograph

### Post-Retirement

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

### Professors

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

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

T.R. Moore; Ph.D.(Aberd.), F.R.S.C.

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

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

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

S. Turner; M.Soc.Sc.(Waikato, N.Z.), Ph.D.(Hull)

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

### Associate Professors

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

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

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

M. Kalacska; M.Sc., Ph.D.(Alta.)

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

B. Lehner; M.Sc.(Freiburg), Ph.D.(Frankfurt)

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

N. Oswin; M.A.(Dal.), Ph.D.(Br. Col.)

B. Robinson; B.Sc.(Georgia Tech.), M.Eng., MCP(MIT), Ph.D.(Wisc. Madison)

R. Sengupta; M.Sc., Ph.D.(Ill.) (*joint appt. with McGill School of Environment*)

R. Sieber; M.P.A.(W. Mich.), Ph.D.(Rutg.) (*joint appt. with McGill School of En352 36988 Tm(N. Oswin; M.A.(Dalpt. with McGill Sc)Tj1 0 07.(Aberd.)th McGill Sci,*

GEOG 699 (24) Thesis Research

**Required Course (3 credits)**

GEOG 631 (3) Methods of Geographical Research

**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.

**12.6.6 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 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.

**12.6.7 Master of Science (M.Sc.) Geography (Thesis): Neotropical Environment (45 credits)**

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

**Thesis Courses (30 credits)**

Thesis Proposal

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.

### 12.6.8 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.

### 12.6.9 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



### 12.6.11 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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## 12.7 Mathematics and Statistics

### 12.7.1 Location

Department of Mathematics and Statistics  
 Burnside Hall, Room 1005  
 805 Sherbrooke Street West  
 Montreal QC H3A 0B9  
 Canada  
 Telephone: 514-398-3800  
 Fax: 514-398-3899  
 Email: [grad.mathstat@mcgill.ca](mailto:grad.mathstat@mcgill.ca)  
 Website: [www.mcgill.ca/mathstat/](http://www.mcgill.ca/mathstat/)

### 12.7.2 About Mathematics and Statistics

The Department of Mathematics and Statistics offers programs that can be focused on applied mathematics, pure mathematics, and statistics leading to master's degrees (**M.A.** or **M.Sc.**), with program options in Bioinformatics and in Computational Science and Engineering (CSE). The research groups are:

- Algebra;
- Algebraic Geometry;
- Analysis;
- Applied Mathematics;
- Differential Equations;
- Differential Geometry;
- Discrete Mathematics;
- Geometric Group Theory;

- Logic;
- Mathematical Biology;
- Mathematical Physics;
- Number Theory;
- Probability;
- Statistics.

In the basic master's programs, students must choose between the thesis option, and the non-thesis option which requires a project. The Bioinformatics and CSE options require a thesis. In addition to the Ph.D. program in Mathematics and Statistics, there is a Ph.D. option in Bioinformatics.

The *Department's website* provides extensive information on the Department and its facilities, including the research activities and research interests of individual faculty members. It also provides detailed supplementary information concerning our programs, admissions, funding of graduate students, thesis requirements, advice concerning the choice of courses, etc.

Students are urged to consult the *Institut des Sciences Mathématiques (ISM) website*, which coordinates intermediate and advanced-level graduate courses among Montreal and Quebec universities. A list of courses available under the ISM auspices can be obtained from the ISM website. The ISM also offers fellowships and promotes a variety of joint academic activities greatly enhancing the mathematical environment in Montreal and in the province of Quebec.

#### **Master of Arts (M.A.) Programs in Mathematics and Statistics**

Detailed program requirements for the following M.A. programs are found in [Arts](#) > [Graduate](#) > [Browse Academic Units & Programs](#) > [Mathematics and Statistics](#).

##### ***: Master of Arts (M.A.) Mathematics and Statistics (Thesis) (45 credits)***

The Department of Mathematics and Statistics offers programs with concentrations in applied mathematics, pure mathematics, and statistics leading to the master's degree (M.A.). The thesis option requires a thesis and six approved courses.

##### ***: Master of Arts (M.A.) Mathematics and Statistics (Non-Thesis) (45 credits)***

The Department of Mathematics and Statistics offers programs with concentrations in applied mathematics, pure mathematics, and statistics leading to the master's degree (M.A.). The non-thesis option requires a project and eight approved courses.

#### **Master of Science (M.Sc.) Programs in Mathematics and Statistics**

Detailed program requirements for the following M.Sc. programs are found in [Science](#) > [Graduate](#) > [Browse Academic Units & Programs](#) > [Mathematics and Statistics](#).

##### ***section 12.7.5: Master of Science (M.Sc.) Mathematics and Statistics (Thesis) (45 credits)***

The Department of Mathematics and Statistics offers programs with concentrations in applied mathematics, pure mathematics, and statistics leading to the master's degree (M.Sc.). The thesis option requires a thesis and six approved courses.

##### ***section 12.7.6: Master of Science (M.Sc.) Mathematics and Statistics (Thesis): Bioinformatics (48 credits)***

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This 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. Students successfully completing the Bioinformatics option at the M.Sc. level will be fluent in the concepts, language, approaches, and limitations of the field.

##### ***section 12.7.7: Master of Science (M.Sc.) Mathematics and Statistics (Thesis): Computational Science & Engineering (47 credits)***

CSE is a rapidly growing multidisciplinary area with connections to the sciences, engineering, mathematics, and computer science. CSE focuses on the development of problem-solving methodologies and robust tools for the solution of scientific and engineering problems.

##### ***section 12.7.8: Master of Science (M.Sc.) Mathematics and Statistics (Non-Thesis) (45 credits)***

The Department of Mathematics and Statistics offers programs with concentrations in applied mathematics, pure mathematics, and statistics leading to the master's degree (M.Sc.). The non-thesis option requires a project and eight approved courses.

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

***: Doctor of Philosophy (Ph.D.) Mathematics and Statistics***

The Department offers a course of studies leading to the Ph.D. degree. It differs substantially from the master's programs in that the student must write a thesis that makes an original contribution to knowledge. The thesis topic is chosen by the student in consultation with the research supervisor. The thesis must be examined and approved by an internal examiner (normally the research supervisor), an external examiner, and the Oral Examination Committee. The student must present an oral defence of the thesis before that Committee. To submit a thesis for examination, the student must first pass comprehensive examinations.

***: Doctor of Philosophy (Ph.D.) Mathematics and Statistics: Bioinformatics***

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics option is to train students to become researchers in this interdisciplinary field. This 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. Students successfully completing the Bioinformatics option at the Ph.D. level will be fluent in the concepts, language, approaches, and limitations of the field and will have the capability of developing an independent bioinformatics

Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
<b>Fall Term:</b>	Sept. 15	Jan. 15	Jan. 15	Jan. 15
	Feb. 15	Sept. 10	Sept. 15	Sept. 15

## Professors

Pengfei Guan; B.Sc.(Zhejiang), M.Sc., Ph.D.(Princ.) (*Canada Research Chair*)  
Jacques C. Hurtubise; B.Sc.(Montr.), D.Phil.(Oxf.) F.R.S.C.  
Dmitry Jakobson; B.Sc.(MIT), Ph.D.(Princ.) (*Peter Redpath Professor*)  
Vojkan Jaksic; B.S.(Belgrade), Ph.D.(Calif. Tech.)  
Niky Kamran; B.Sc., M.Sc.(Bruxelles), Ph.D.(Wat.), F.R.S.C. (*James McGill Professor*)  
Adam Oberman; B.S.(Tor.), M.S., Ph.D.(Chic.)  
Charles Roth; M.Sc.(McG.), Ph.D.(Hebrew)  
David A. Stephens; B.Sc., Ph.D.(Nott.)  
John A. Toth; B.Sc., M.Sc.(McM.), Ph.D.(MIT)  
Adrian Vetta; B.Sc., M.Sc.(LSE), Ph.D.(MIT) (*joint appt. with Computer Science*)  
Daniel T. Wise; B.A.(Yeshiva), Ph.D.(Princ.) (*James McGill Professor*)  
David Wolfson; B.Sc., M.Sc.(Natal), Ph.D.(Purd.)

## Associate Professors

Louigi Addario-Berry; B.Sc., M.Sc., Ph.D.(McG.)  
Antony R. Humphries; B.A., M.A.(Camb.), Ph.D.(Bath)  
Abbas Khalili; B.S., M.S.(Isfahan Univ. of Tech), Ph.D.(Wat.)  
Jean-Philippe Lessard; B.Sc.(Sher.), M.Sc.(Montr.), Ph.D.(Georgia Tech.)  
Jean-Christophe Nave; B.Sc., Ph.D.(Calif., Santa Barbara)  
Johanna Neslehova; B.Sc., M.Sc.(Hamburg), Ph.D.(Oldenburg)  
Sergey Norin; M.S.(Saint Petersburg St.), Ph.D.(Georgia Tech.)  
Mikael Pichot; B.Sc.(Lyon), M.S., Ph.D.(ENS Lyon)  
Russell Steele; B.S., M.S.(Carn. Mell), Ph.D.(Wash.)  
Gantumur Tsogtgerel; B.Sc.(Nat. Univ. Mongolia), M.Sc., Ph.D.(Utrecht)

## Assistant Professors

Linan Chen; B.S.(Tsinghua), Ph.D.(MIT)  
Sarah Harrison; B.Sc.(MIT), Ph.D.(Stan.) (*joint appt. with Physics*), (*Canada Research Chair*)  
Tim Hoheisel; Dipl., Ph.D.(Wurzburg)  
Jessica Lin; B.A.(NYU), Ph.D.(Chic.)  
Michael Lipnowski; B.Sc. (Waterloo), Ph.D. (Stanford)  
Piotr Przytycki; M.Sc., Ph.D.(Warsaw)  
Brent Pym; B.ScE (Queens), M.Sc., Ph.D. (Toronto)  
Marcin Sabok; M.Sc., Ph.D.(Warsaw)  
Jérôme Vétois; Ph.D.(Cergy-Pontoise)  
Yi Yang; B.S.(Sichuan), M.S., Ph.D.(Minn.)

## Associate Members

Xiao-Wen Chang (*Computer Science*)  
Pierre R.L. Dutilleul (*Plant Science*)  
Leon Glass (*Physiology*)  
James A. Hanley (*Epidemiology and Biostatistics*)  
Hamed Hatami (

### Associate Members

Anmar Khadra (*Physiology*)

Michael Mackey (*Physiology*)

Erica E.M. Moodie (*Epidemiology and Biostatistics*)

Prakash Panangaden (*Computer Science*)

Robert W. Platt (*Epidemiology and Biostatistics*)

James O. Ramsay (*Psychology*)

Alexandra Schmidt (*Epidemiology and Biostatistics*)

Kaleem Siddiqi (*Computer Science*)

Christina Wolfson (*Epidemiology and Biostatistics*)

### Adjunct Professors

Renato C. Calleja; B.S.(Tec. Autonomo de Mexico), Ph.D.(Texas-Austin)

Vasek Chvatal; Ph.D.(Wat.)

Eliot Freid; B.S.(Calif. Poly. St.), M.S., Ph.D.(Calif. Tech.)

Andrew Granville; B.A., CASM(Camb.), Ph.D.(Qu.)

Adrian Iovita; B.S.(Bucharest), Ph.D.(Boston)

Dimitris Koukoulopoulos; M.Sc., Ph.D.(Ill.-Chic.)

Xin Yang Lu; B.Sc., M.Sc., Ph.D.(Pisa)

Etienne Marceau; B.Sc., M.Sc.(Laval); Ph.D.(Louvain)

Ming Mei; B.Sc., M.Sc.(Jiangxi Normal Uni.), Ph.D.(Kanazawa)

M. Ram Murty; B.Sc.(Car.), Ph.D.(MIT), F.R.S.C.

Claude-Alain Pillet; M.Sc., Ph.D.(ETH Zurich)

Iosif Polterovich; M.Sc.(Moscow St.), Ph.D.(Weizmann Inst.)

F. Bruce Shepherd; B.Sc.(Vic., Tor.), M.Sc., Ph.D.(Wat.)

Armen Shirikyan; M.Sc., Ph.D.(Moscow St.); Habilitation(Paris-Sud XI)

Johannes Walcher; Dip., Ph.D.(ETH Zurich) (*joint appt. with Physics*)

### Senior Faculty Lecturer

Axel Hundemer; M.Sc., Ph.D.(Munich)

Armel Djivede Kelome; M.Sc.(Benin), M.Sc.(McG.), Ph.D.(Georgia Tech.)

### Faculty Lecturers

José A. Correa; M.Sc.(Wat.), Ph.D.(Car.)

Jérôme Fortier; B.Sc., M.Sc.(Laval), Ph.D.(UQAM)

Jeremy Macdonald; B.Sc., M.Sc.(Alberta), Ph.D.(McG.)

Sidney Trudeau; Ph.D.(McG.)

## 12.7.5 Master of Science (M.Sc.) Mathematics and Statistics (Thesis) (45 credits)

### Thesis Courses (24 credits)

MATH 600	(6)	Master's Thesis Research 1
		Master's Thesis Research 2r's

**Complementary Courses (21 credits)**

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

**12.7.6 Master of Science (M.Sc.) Mathematics and Statistics (Thesis): Bioinformatics (48 credits)****Thesis Courses (24 credits)**

MATH 600	(6)	Master's Thesis Research 1
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 (3 credits)**

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

**Complementary Courses (21 credits)**

6 credits 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

15 credits of approved courses at the 500 or 600 level. Additional courses may be required at the discretion of the candidate's supervisory committee.

**12.7.7 Master of Science (M.Sc.) Mathematics and Statistics (Thesis): Computational Science & Engineering (47 credits)****Thesis Courses (24 credits)**

MATH 600	(6)	Master's Thesis Research 1
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
AT	(3)	Turbulence in Atmosphere and Oceans





related to the physics and mathematics of superstring theory. The high-energy theorists have close connections to the nuclear theory group, the astrophysics group, the high-energy e

a Ph.D. in Physics administered through the Department of Physics with a research emphasis on medical physics supervised, funded, and hosted by Medical

### 12.8.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the Department of Physics and may be revised at any time. Applicants must verify all deadlines and documentation requirements well in advance on the appropriate McGill departmental website; please consult the list at [www.mcgill.ca/gps/contact/graduate-program](http://www.mcgill.ca/gps/contact/graduate-program).

Application Opening Dates		Application Deadlines		
	All Applicants	Non-Canadian citizens (incl. Special, Visiting & Exchange)	Canadian citizens/Perm. residents of Canada (incl. Special, Visiting & Exchange)	Current McGill Students (any citizenship)
<b>Fall Term:</b>	Sept. 15	Dec. 15	Dec. 15	Dec. 15
<b>Winter Term:</b>	Feb. 15	Sept. 10	Sept. 10	Sept. 10
<b>Summer Term:</b>	N/A	N/A	N/A	N/A

Please note, the Ph.D. program with a research emphasis on medical physics only accepts students in Fall.

Admission to graduate studies is competitive; accordingly, late and/or incomplete applications are considered only as time and space permit.

### 12.8.4 Physics Faculty

Chair

P. Grönlund

**Professors**

P

## Associate Members

M. Chacron (*Physiology*)

S. Devic (*Oncology*)

S. Enger (*Oncology*)

K. Gehring (*Biochemistry*)

P

## **12.9 Psychology**

### **12.9.1 Location**

Department of Psychology  
2001 McGill College Avenue, 7th Floor  
Montreal QC H3A 1G1  
Canada  
Telephone: 514-398-6124/514-398-6100  
Fax: 514-398-4896  
Email:

**Arts > Graduate > Browse Academic Units & 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.

**Science > Graduate > Browse Academic Units & Programs > Psychology > section 12.9.5: Master of Science (M.Sc.) 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.

**: Doctor of Philosophy (Ph.D.) Psychology**

Please contact the Department for more information about this program.

**section 12.9.7: Doctor of Philosophy (Ph.D.) Psychology: Behavioural Neuroscience**

The Ph.D. in Psychology: Behavioural Neuroscience program emphasizes modern, advanced theory and methodology aimed at the neurological underpinnings of behaviour in human and non-human animals. This program is intended for graduate students in any area of Psychology who wish to obtain unique, intensive training at the intersection of psychology and neuroscience, thereby enhancing their expertise, the interdisciplinary potential of their dissertation research, and enabling them to compete successfully for academic or commercial positions in either field alone, or their intersection. It requires that students complete a dissertation that addresses Behavioural Neuroscience themes.

**section 12.9.8: Doctor of Philosophy (Ph.D.) Psychology: Language Acquisition**

This unique interdisciplinary program focuses on the scientific exploration of language acquisition by different kinds of learners in diverse contexts. Students in the Language Acquisition program are introduced to theoretical and methodological issues on language acquisition from the perspectives of cognitive neuroscience, theoretical linguistics, psycholinguistics, education, communication sciences and disorders, and neuropsychology.

**section 12.9.9: Doctor of Philosophy (Ph.D.) Psychology: Psychosocial Oncology**

The Department of Oncology, in conjunction with the Ingram School of Nursing, the Department of Psychology, and the School of Social Work, has developed the cross-disciplinary Psychosocial Oncology Option (PSOO). This option is open to doctoral students in the Ingram School of Nursing and in the Department of Psychology who are interested in broadening their knowledge of psychosocial issues in oncology.

**12.9.3 Psychology Admission Requirements and Application Procedures****12.9.3.1 Admission Requirements**

Admission to the graduate program depends on an evaluation of students' research interests and their aptitude for original contributions to knowledge and, if applicable, for professional contributions in the applied field.

The usual requirement for admission is an Honours or majors degree (B.A. or B.Sc.) in Psychology. This usually includes an introductory course plus twelve courses in psychology (each equivalent to three term hours). Courses in experimental psychology, the theoretical development of modern ideas in psychology, and statistical methods as applied to psychological problems (equivalent to an introductory course) are essential. Applicants' knowledge of relevant biological, physical, and social sciences is considered. Students applying to the clinical program are advised to complete 42 specific undergraduate credits in psychology as specified by the *Order of Psychologists of Quebec* (*Ordre des psychologues du Québec*).

Applicants who hold a bachelor's degree but who have not met these usual requirements should consult the Graduate Program Director to determine which (if any) courses must be completed before an application can be considered. Students with insufficient preparation for graduate work may register as Special Students (undergraduate level) in the Faculty of Arts or the Faculty of Science, and follow an appropriate course of study. Such registration requires the permission of the Department but carries no advantage with respect to a student's eventual admission to graduate studies.

Applicants should note that the deadline for many scholarships and fellowships is about four months earlier than the application deadlines and that applications for scholarships and fellowships should be submitted through their home university.

All applicants must take the *GRE* General Test if they have studied in an English-speaking university. For those who have a psychology background, it is recommended to take the Subject component of the GRE. Applicants with little or no background in psychology are not required to submit scores on the Subject component of the GRE. Canadians who have not studied in an English-speaking university are not required to submit the GRE General Test and Subject component.



**Note:** Official transcripts need not be included as part of an application; they will only be requested once applicants are formally accepted into the program.

### **12.9.3.2 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).

See [University Regulations & Resources](#) > *Graduate* > *Graduate Admissions and Application Procedures* > : [Application Procedures](#) for detailed application procedures.

#### **12.9.3.2.1 Additional Requirements**

The items and clarifications below are additional requirements set by this department:

- Three letters of reference
- Personal Statement
-



## Assistant Professors

J. Flake; B.Sc.(NKU), M.A.(JMU), Ph.D.(Conn.)

O. Hardt; B.Sc., M.Sc.(Trier), Ph.D.(Ariz.)

E. Hehman; B.A.(Mass.), Ph.D.(Delaware)

L. Human; B.A., M.A., Ph.D.(Br. Col.)

R. Otto; B.Sc.(Calif.-LA), Ph.D.(Texas-Austin)

S. Racine; B.Sc.(McG.), M.A., Ph.D.(Mich. St.)

M. Roy; B.Sc., Ph.D.(Montr.)

S. Sheldon; B.Sc.(Alta.), M.A., Ph.D.(Tor.)

D. Vachon; B.Sc.(Tor.), M.Sc., Ph.D.(Purd.)

A. Weinberg; B.A.(Wesl.), M.A., Ph.D.(SUNY, Stony Brook) (*Canada Research Chair*)

TTTJ. Flaudith LeGallais., M.A., Ph.D.(BrBr

### 12.9.6 Doctor of Philosophy (Ph.D.) Psychology

All candidates for the Ph.D. degree must demonstrate broad scholarship, mastery of current theoretical issues in psychology and their historical development, and a detailed knowledge of their special field. Great emphasis is placed on the development of research skills, and the dissertation forms the major part of the evaluation at the Ph.D. level.

Ph.D. students in Clinical Psychology must fulfil similar requirements to Ph.D. students in the Experimental Program and must also take a variety of specialized courses, which include practicum and internship experiences.

#### 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

PSYC 701 (0) Doctoral Comprehensive Examination

#### Complementary Courses

12-24 credits

12 credits (one course per term in Year 2 and Year 3) chosen from the following list:

PSYC 710	(3)	Comparative and Physiological Psychology 1
PSYC 711	(3)	Comparative and Physiological Psychology 2
PSYC 712	(3)	Comparative and Physiological Psychology 3
PSYC 713	(3)	Comparative and Physiological Psychology 4
PSYC 714	(3)	Comparative and Physiological Psychology 5
PSYC 715	(3)	Comparative and Physiological Psychology 6
PSYC 718	(3)	Learning and Motivation
PSYC 722	(3)	Personality and Social Psychology
PSYC 723	(3)	Personality and Social Psychology
PSYC 724	(3)	Personality and Social Psychology
PSYC 725	(3)	Personality and Social Psychology
PSYC 727	(3)	Personality and Social Psychology

PSYC 746	(3)	Quantitative and Individual Differences
PSYC 747	(3)	Quantitative and Individual Differences
PSYC 748	(3)	Quantitative and Individual Differences
PSYC 749	(3)	Quantitative and Individual Differences
PSYC 752D1	(3)	Psychotherapy and Behaviour Change
PSYC 752D2	(3)	Psychotherapy and Behaviour Change
PSYC 753	(3)	Health Psychology Seminar 1
PSYC 754	(3)	Health Psychology Seminar 2
PSYC 755	(3)	Health Psychology Seminar 3
PSYC 756	(3)	Health Psychology Seminar 4

0-12 credits from the follo

PSYC 660D2

(3)

Psychology Theory

Note: The Department of Psychology does not ordinarily require an examination in a foreign language however, all students planning on practicing clinical psychology in the pro

PSYC 741	(3)	Perception and Cognition
PSYC 742	(3)	Perception and Cognition
PSYC 743	(3)	Perception and Cognition
PSYC 744	(3)	Perception and Cognition
PSYC 746	(3)	Quantitative and Individual Differences
PSYC 747	(3)	Quantitative and Individual Differences
PSYC 748	(3)	Quantitative and Individual Differences
PSYC 749	(3)	Quantitative and Individual Differences
		Psychotherapy and Beh5 0 0 1 258001 eption andg

0-3 credits of statistics from the following list:

EDPE 676	(3)	Intermediate Statistics
EDPE 682	(3)	Univariate/Multivariate Analysis
LING 620	(3)	Experimental Linguistics: Methods
PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2

Students who have taken an equivalent course in statistics will be deemed to have satisfied this requirement for the Language Acquisition Option.

These 3 credits are only required for students who have a course in statistics.

PSYC 650	(3)	Advanced Statistics 1
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PSYC 507	(3)	Emotions, Stress, and Illness
PSYC 753	(3)	Health Psychology Seminar 1
SWRK 609	(3)	Understanding Social Care
SWRK 668	(3)	Living with Illness, Loss and Bereavement

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## **12.10 Redpath Museum**

### **12.10.1 Location**

Redpath Museum  
859 Sherbrooke Street rbrook

### **Associate Professors**

Hans C.E. Larsson; B.Sc.(McG.), Ph.D.(Chic.)

Virginie Millien; Maîtrise(Paris VI), DEA, Ph.D.(Montpellier II)

### **Assistant Professor**

Rowan Barrett; B.Sc.(Guelph), M.Sc.(McG.), Ph.D.(Br. Col.) (*CRC Tier 2 Chair in Biodiversity Science*)

### **Associate Members**

*Biology*: Graham A.C. Bell, Lauren Chapman

*Chemistry*: David N. Harpp (*T*)

