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

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## 1 Graduate and Postdoctoral Studies

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### 1.1 Administrative Officers

#### Administrative Officers

Josephine Nalbantoglu; B.Sc., Ph.D.(McG.)

**Associate Provost (Graduate Education) and Dean (Graduate and Postdoctoral Studies)**

Lorraine Chalifour; B.Sc., Ph.D. (Manit.)

**Associate Dean (Graduate and Postdoctoral Studies)**

Nathan Hall; B.A., M.A., Ph.D. (Manit.)

**Associate Dean (Graduate and Postdoctoral Studies)**

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

**Associate Dean (Graduate and Postdoctoral Studies)**

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### 1.2 Location

James Administration Building, Room 400  
845 Sherbrooke Street West  
Montreal QC H3A 0G4  
Website: [mcgill.ca/gps](https://mcgill.ca/gps)



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

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### 1.3 Graduate and Postdoctoral Studies' Mission

The mission of Graduate and Postdoctoral Studies (GPS) is to promote university-wide academic excellence for graduate and postdoctoral education at McGill. GPS provides leadership and strategic direction across the university in close collaboration with the academic and administrative units, and the graduate and postdoctoral community.

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## 2 Important Dates

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

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## 3 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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## 4 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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## 5 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 information regarding admissions and application procedures for Graduate and Postdoctoral Studies.

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## 6 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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## 7 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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### 7.1 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 them 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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### 7.2 Guidelines and Policy for Academic Units on Postdoctoral Education

Every unit hosting postdocs should apply institutional policies and procedures for the provision of postdoctoral education and have established means for informing postdocs of policies, procedures, and privileges (available at [mcgill.ca/gps/postdocs](http://mcgill.ca/gps/postdocs)), as well as mechanisms for addressing complaints. For their part, postdocs are responsible for informing themselves of such policies, procedures, and privileges.

#### 1. Definition and Status

- Postdoctoral status will be recognized by the University in accordance with Quebec provincial regulations as may be modified from time to time. The eligibility period for postdoctoral status is up to five years from the date when the Ph.D. or equivalent degree was awarded. A : *leave of absence* for parental or health reasons may extend the eligibility period. Leaves for other reasons, including vacation, do not impact the eligibility period.
- Some McGill postdocs have dual status as both students and employees (unionized or non-unionized). Consult the [Graduate and Postdoctoral Studies website](#) for definitions of Postdoctoral Fellows, Postdoctoral Scholars, and Postdoctoral Researchers.
- Postdocs must conduct research under the supervision of a McGill professor (including Adjunct Professors), qualified in the discipline in which training is being provided and with the ability to fulfil supervisory responsibilities and act as a mentor for career development. Postdocs are expected to engage primarily in research with minimal teaching or other responsibilities.

#### 2. Registration

- Postdocs must *register* annually with the University through Enrolment Services. Registration will be limited to postdocs who fulfil the definition above, and who meet the eligibility criteria as stipulated on the [Graduate and Postdoctoral Studies website](#).

- ii. Upon registration, postdocs will be eligible for a University identity card issued by Enrolment Services.
- iii. Leaves of absence must comply with the Graduate and Postdoctoral Studies Policies for Vacation, Parental/Familial, and Health Leave (see [section 7.3: Vacation Policy for Graduate Students and Postdocs](#) and [University Regulations & Resources](#) > Graduate > Regulations > Categories of Students > : [Leave of Absence Status](#)).

### **3. Appointment, Funding, Letter of Agreement**

- i. Postdoctoral appointments may not exceed the registration eligibility period as defined above.
- ii. In order to be registered, the postdoc must be assured of financial support other than from personal means during their stay at McGill University. This amount must be equivalent to the minimal stipend requirement set by the University in accordance with guidelines issued by federal and provincial research granting agencies or the collective agreement, as applicable. Funding during parental leave is subject to the conditions of the funding agency or the collective agreement, as applicable.
- iii. Postdocs require a [Letter of Agreement for Postdoctoral Education](#) signed by the postdoc, the supervisor, and the department/unit head or delegate.
- iv. Postdocs with full responsibility for teaching a course should be compensated over and above

- to clarify expectations regarding intellectual property rights in accordance with the University's policy;
- to provide mentorship for career development; and
- to prepare, sign, and adhere to a Letter of Agreement for Postdoctoral Education.

vi. Some examples of the responsibilities of postdocs are:

- to inform themselves of and adhere to the University'

research stage. Individuals who are expecting to spend more than one year are encouraged to obtain formal training (Master's or Ph.D.) through application to a relevant graduate program.

**Category 4:** An individual with a regulated health professional degree (as defined under CIHR-eligible health profession), but not a Ph.D. or equivalent or medical specialty training, but who fulfils criteria for funding on a tri-council operating grant or by a CIHR fellowship (up to maximum of five years post-degree).



**Note:** Individuals who are not Canadian citizens or permanent residents must inquire about eligibility for a work permit.

#### General Conditions

- The maximum duration is three years.
- The individual must be engaged in full-time research.
- The individual must provide copies of official transcripts/diplomas.
- The individual must have the approval of a McGill professor to supervise the research and of the Unit.
- The individual must have adequate proficiency in English, but is not required to provide official proof of English competency to Enrolment Services.
- The individual must comply with regulations and procedures governing research ethics and safety and obtain the necessary training.
- The individual will be provided access to McGill libraries, email, and required training in research ethics and safety. Any other University services must be purchased (e.g., access to athletic facilities).
- The individual must arrange for basic health insurance coverage prior to arrival at McGill and may be required to provide proof of coverage.

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## 8 Graduate Studies Guidelines and Policies

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

- Guidelines and Regulations for Academic Units on Graduate Student Advising and Supervision
- Policy on Graduate Student Research Progress Tracking
- Ph.D. Comprehensives Policy
- Graduate Studies Reread Policy
- Failure Policy
- Guideline on Hours of Work

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## 9 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 and Responsibilities
- Student Services – Downtown and 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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## 10 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 Gov](#)

- synoptic and mesoscale meteorology; and
- remote sensing of weather and climate.

Some faculty members have close ties with other departments, schools, and centres, including the Chemistry and the Mathematics and Statistics departments; the *Bieler School of Environment*; *ArcticNet*; and *Quebec Ocean*. Facilities include the McGill Atmospheric Profiling 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 high-performance computing clusters available through the Digital Research Alliance of 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 is available for all qualified graduate students. Additional financial support is provided in the form of teaching assistantships, subject to availability and eligibility constraints.

#### ***section 11.1.4: 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, this background is not necessary to succeed in the program. McGill offers the only program in Canada that includes both atmospheric and oceanic sciences. Students benefit from a high professor-to-student ratio and access to state-of-the-art computing, remote sensing, and atmospheric chemistry laboratory equipment. The Department also has close ties with Environment & Climate Change Canada's numerical weather prediction centre in Dorval, Quebec.

Our program allows considerable flexibility as to the choice of research topics, and gives students both a strong classroom knowledge of the subject as well as the opportunity to choose from a variety of thesis research projects. Students who do not choose to continue in academia find employment in a variety of areas and places; for example, working with Environment & Climate Change Canada as research associates or weather forecasters.

#### ***section 11.1.5: Doctor of Philosophy (Ph.D.) Atmospheric and Oceanic Sciences***

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

#### ***section 11.1.6: Doctor of Philosophy (Ph.D.) Atmospheric and Oceanic Sciences: Environment***

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

The Ph.D. in Atmospheric and Oceanic Sciences: Environment (option) is a research program offered in collaboration with the *Bieler School of Environment*. As a complement to the unit's expertise, the program considers how various dimensions (scientific, social, legal, ethical) interact to define environment and sustainability issues. The Environment option builds on the same program and a similar undergraduate background as described under Doctor of Philosophy (Ph.D.) Atmospheric and Oceanic Sciences. In addition, the Environment option includes required courses from Atmospheric and Oceanic Sciences and from Environment, as well as complementary courses in Atmospheric and Oceanic Sciences and in Environment.

Prospective Environment Option students must apply for admission to both Atmospheric and Oceanic Sciences and the School of Environment and must meet the entrance requirements of both. Acceptability into the Environment option will be based on academic experience and performance, availability of a supervisor or co-supervisor, the proposed research, and plans for funding as articulated by the supervisor(s). This option is not available to students entering at the Ph.D. 1 level, but can be chosen in subsequent years.

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

### **11.1.3.1 Admission Requirements**

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

Applicants to the Ph.D. program would normally have a strong background in meteorology, physical oceanography, or related disciplines such as mathematics, physics, chemistry, and engineering. Many students will have an M.Sc. degree in one of these fields, although this is not a formal requirement. All Ph.D. students are required to take at least two graduate-level courses in atmospheric and oceanic sciences. Students entering without a master's degree or without a sufficient background in atmospheric and/or oceanic sciences are admitted at the Ph.D. 1 level and are required to take an additional five graduate-level courses in atmospheric and oceanic sciences, these usually being completed in the first two semesters.

Applicants to the Environment Option of our Ph.D. program must apply for admission to both Atmospheric and Oceanic Sciences and the Bieler School of Environment and must meet the entrance requirements of both programs (see also information here: [mcgill.ca/environment/envroption](http://mcgill.ca/environment/envroption)). Acceptability into the Environment option will be based on academic experience and performance, availability of a supervisor or co-supervisor, the proposed research, and plans for funding as articulated by the supervisor(s). This option is not available to students entering at the PhD 1 level, but can be chosen in subsequent years.

Inquiries should be addressed directly to the [Student Affairs Coordinator](#), Department of Atmospheric and Oceanic Sciences; see the [department website](#) for more information.

### English Language Proficiency

For graduate applicants whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized Canadian or American (English or French) institution or from a recognized foreign institution where English is the language of instruction, documented proof of English proficiency is required prior to admission. For a list of acceptable test scores and minimum requirements, visit [mcgill.ca/gradapplicants/international/proficiency](http://mcgill.ca/gradapplicants/international/proficiency)

#### 11.1.3.2 Application Procedures

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

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

#### 11.1.3.2.1 Additional Requirements

The item below is an additional requirement set by this department:

- Acceptance by a research supervisor – required for the Ph.D. program

#### 11.1.3.3 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 Atmospheric and Oceanic Sciences. Applicants are responsible for verifying all deadlines and documentation requirements well in advance by consulting the departmental website at [mcgill.ca/meteo/programs-0/graduate-studies/prospective-graduate-students](http://mcgill.ca/meteo/programs-0/graduate-studies/prospective-graduate-students).

Please note that application deadlines may exceptionally be revised during the application cycle. For current deadline information, please visit the above-mentioned departmental website ().

Information on application deadlines is available at [mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines](http://mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines).

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.

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

The M.Sc. degree requires a minimum of 45 credits, up to a maximum of 51 credits. The program includes from 9 to 27 credits of coursework (depending on the student's background).

#### 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.

#### Complementary Courses (21 credits)

Must complete or have completed the following courses or equivalent:

ATOC 512	(3)	Atmospheric and Oceanic Dynamics
ATOC 513	(3)	Waves and Stability
ATOC 515	(3)	Turbulence in Atmosphere and Oceans
ATOC 519*	(3)	Advances in Chemistry of Atmosphere
ATOC 521	(3)	Cloud Physics
ATOC 525	(3)	Atmospheric Radiation





ATOC 700	(1)	Ph.D. Proposal Seminar
ATOC 701	(0)	Ph.D. Comprehensive (General)
ENVR 615	(3)	Interdisciplinary Approach Environment and Sustainability

**Complementary Courses (13 credits)**

Students are required to take ATOC 751D1 and ATOC 751D2 OR ATOC 752D1 and ATOC 752D2.

1 credit from:

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

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

3-6 credits from:

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 614	(3)	Mobilizing Research for Sustainability

0-3 credits from:

ENVR 585	(3)	Readings in Environment 2
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or 3 credits at the 500 level or higher recommended by the Advisory Committee and approved by the Environment Option Committee. (Environment Option)

- [Conservation, Ecology, Evolution and Behaviour](#)
- [Molecular, Cellular and Developmental Biology](#)
- [Neurobiology and Behaviour](#)

In addition to the regular M.Sc. and Ph.D. programs, the Biology Department offers specialized program options in Environment and Neotropical Environment (NEO) (see below).

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 includes a two-course sequence on research and professional skills, and one to two topical courses, usually in the form of literature-based seminars. To complement their classroom and research training, students regularly attend seminar series and journal clubs, and present their own work annually in a formal seminar.

The Department of Biology is embedded in an outstanding and collaborative research environment with access to state-of-the-art infrastructure in the Stewart Biology Building and the Bellini Life Science Complex, as well as excellent field facilities in Canada and abroad. Affiliated centres and field stations include:

- [McGill University Phytotron](#)
- [Redpath Museum](#)
- [Integrated Quantitative Biology Initiative \(IQBI\)](#)
- [Advanced BioImaging Facility \(ABIF\)](#)
- [Gault Nature Reserve](#) at Mont St. Hilaire (Quebec)
- [Penfield Nature Conservancy](#) on Lake Memphrémagog (Quebec)
- [McGill Subarctic Research Station](#) at Schefferville (Quebec)
- [Bellairs Research Institute](#) (Barbados)
- [Smithsonian Tropical Research Institute \(STRI\)](#) (Panama)

The Department of Biology offers financial support to both Canadian and international students. Funding packages include a stipend to offset living expenses and a tuition and fees subsidy. For more information on graduate student funding in Biology, please visit [Biology > Graduate Studies > Current Graduate Students > Graduate Funding](#).

#### ***section 11.2.4: Master of Science (M.Sc.) Biology (Thesis) (45 credits)***

The Master of Science in Biology is a research-focused program that encompasses a diverse range of topics in biology, from molecules and cells to organisms and ecosystems, including development, behaviour and evolution. Research themes include: (1) molecular, cellular and developmental biology, (2) conservation, ecology and evolution, and (3) neurobiology and behaviour. This program allows students considerable flexibility in their choice of research and coursework and encourages cross-disciplinary thinking.

Incoming graduate students will have a strong background in the biological sciences, often with specific strengths in their proposed area of study. To encourage interdisciplinary work, the program may also accept students with a high scholastic standing in fields other than biology (medicine, engineering, chemistry, physics, etc.). Alumni have gone on to pursue a widearray



#### 11.2.4 Master of Science (M.Sc.) Biology (Thesis) (45 credits)

The Master of Science in Biology is a research-focused program that encompasses a diverse range of topics in biology, from molecules and cells to organisms and ecosystems, including development, behaviour and evolution. Research themes include: (1) molecular, cellular and developmental biology, (2) conservation, ecology and evolution, and (3) neurobiology and behaviour. This program allows students considerable flexibility in their choice of research and coursework and encourages cross-disciplinary thinking.

##### Required Courses (39 credits)

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

### 11.2.6 Master of Science (M.Sc.) Biology (Thesis): Neotropical Environment (45 credits)

The McGill-STRI Neotropical Environment Option (NEO) is a research-based option for Masters students in the departments of Anthropology, Biology, Bioresource Engineering, Geography, Natural Resource Sciences, Plant Science, and Political Science at McGill University. NEO is aimed at students who wish to focus their graduate research on environmental issues relevant to the Neotropics and Latin American countries. NEO favors 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.

Whether applying to a Master or a PhD, students are expected to meet all the degree requirements of the department in which they are registered. In addition, NEO students will have to meet the specific requirements of the option.

#### Thesis Courses (36 credits)

BIOL 690	(10)	Master's Thesis Research 4
BIOL 697	(13)	Master's Thesis Research 1
BIOL 698	(13)	Master's Thesis Research 2

#### Required Courses (6 credits)

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

#### Elective Courses (3 credits)

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

### 11.2.7 Doctor of Philosophy (Ph.D.) Biology

The Doctor of Philosophy in Biology is a research-focused program that encompasses a diverse range of topics in biology, from molecules and cells to organisms and ecosystems, including development, behaviour and evolution. Research themes include: (1) molecular, cellular and developmental biology, (2) conservation, ecology and evolution, and (3) neurobiology and behaviour.

### 11.2.8 Doctor of Philosophy (Ph.D.) Biology: Environment

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

The Ph.D. in Biology- Environment Option is a research program offered with the Bieler School of Environment and other academic units at McGill. As a complement to the unit's expertise, the program considers how various dimensions (scientific, social, legal, ethical) interact to define environment and sustainability issues.

#### Thesis

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

#### Required Courses (9 credits)

BIOL 700	(0)	Doctoral Qualifying Examination
BIOL 702	(6)	Ph.D. Seminar
ENVR 615	(3)	Interdisciplinary Approach Environment and Sustainability

#### Complementary Courses (6 credits)

3-6 credits chosen from:

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 614	(3)	Mobilizing Research for Sustainability

0-3 credits chosen from:

ENVR 585	(3)	Readings in Environment 2
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or 3 credits at the 500 level or higher recommended by the Advisory Committee and approved by the Environment Option Committee.

### 11.2.9 Doctor of Philosophy (Ph.D.) Biology: Neotropical Environment

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

#### Thesis

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

#### Required Courses (12 credits)

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

#### Elective Courses (3 credits)

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

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## 11.3 Chemistry

### 11.3.1 Location

Department of Chemistry  
Otto Maass Chemistry Building  
801 Sherbrooke Street West  
Montreal QC H3A 0B8  
Canada  
Telephone: 514-398-6999  
Fax: 514-398-3797  
Email: [graduate.chemistry@mcgill.ca](mailto:graduate.chemistry@mcgill.ca)



physical properties of nanostructures. There is significant activity in understanding directed molecular assembly at interfaces and in the application of sophisticated spectroscopic tools to explore them.

### **Green and Sustainable Chemistry**

Green Chemistry is a concept developed in the 1990s by pioneers Paul Anastas and John Warner. It proposes a vision for chemistry in which its products and processes are designed so as to not harm our health or our environment. The sister concept of sustainable chemistry was developed in parallel, with the idea to add the notion of ensuring the renewability of resources. Green and Sustainable Chemistry is now a strategic, key area of research development, with its own vibrant community, dedicated journals and international research centres. It is also identified as a key strategic area for McGill University, as the Department of Chemistry has pioneered the teaching of the topic since 1999. Typically Green and Sustainable Chemistry covers research using tools in organic, inorganic, physical, and biological chemistries with the goal to develop concepts and solutions to grand challenges in sustainability. This field is directly harnessing the powers of chemistry as a toolbox to enable the Sustainable Development Goals, set by the United Nations in 2015.

### **Synthesis/Catalysis**

The Synthesis/Catalysis Research Activity Group is a collective that develops state-of-art catalysts, synthetic methodologies, reaction mechanisms, and synthetic routes for organic chemicals, natural products, and materials. The collective's major research activities at McGill include: (1) Development of novel catalysts and catalytic reactions for highly efficient organic synthesis; Green Chemistry. This includes the study and discov

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CHEM 692	(6)	M.Sc. Thesis Research 2
CHEM 693	(9)	M.Sc. Thesis Research 3
CHEM 694	(12)	M.Sc. Thesis Research 4
CHEM 695	(15)	M.Sc. Thesis Research 5

#### Required Courses

(5 credits)

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

#### Complementary Courses

(9-16 credits)

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

### 11.3.5 Doctor of Philosophy (Ph.D.) Chemistry

#### Thesis

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

#### Required Courses

CHEM 650	(1)	Seminars in Chemistry 1
CHEM 651	(1)	Seminars in Chemistry 2
CHEM 688	(3)	Progress Assessment 1
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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## 11.4 Computer Science

### 11.4.1 Location

School of Computer Science  
McConnell Engineering, Room 318  
3480 University Street  
Montreal QC H3A 0E9  
Canada  
Telephone: 514-398-7071  
Fax: 514-398-3883  
Email: [grad.cs@mcgill.ca](mailto:grad.cs@mcgill.ca)  
Website: [cs.mcgill.ca](http://cs.mcgill.ca)

#### 11.4.2 About Computer Science

The School of Computer Science is one of the leading teaching and research centres for computer science in Canada and offers several graduate programs. The Master of Science (M.Sc.) Thesis and Doctor of Philosophy (Ph.D.) are research-centric programs preparing students for research careers in academia or industry. They both offer an option in bioinformatics. The Master of Science (M.Sc.) Non-Thesis program is targeted at students looking for careers in applied research and development in industry. In all programs, students will be exposed to cutting-edge computer science developments. Research in the School covers a broad range of areas, including:

- **Theory:** algorithms, combinatorial optimization, computational geometry, cryptography, graph theory, logic and computation, programming languages,

### **11.4.3.2 Application Procedures**

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

See [University Regulations & Resources](#) > *Graduate* > *Graduate Admissions and Application Procedure*

COMP 547	(4)	Cryptography and Data Security
COMP 552	(4)	Combinatorial Optimization
COMP 553	(4)	Algorithmic Game Theory
COMP 554	(4)	Approximation Algorithms
COMP 562	(4)	Theory of Machine Learning
COMP 566	(3)	Discrete Optimization 1
COMP 567	(3)	Discrete Optimization 2
COMP 610	(4)	Information Structures 1
COMP 611	(4)	Mathematical Tools for Computer Science
COMP 642	(4)	Numerical Estimation Methods
COMP 647	(4)	Advanced Cryptography
COMP 649	(4)	Quantum Cryptography
COMP 690	(4)	Probabilistic Analysis of Algorithms
COMP 760	(4)	Advanced Topics Theory 1
COMP 761	(4)	Advanced Topics Theory 2

Category B: Systems

(4)	Distri2on
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COMP 561	(4)	Computational Biology Methods and Research
COMP 564	(3)	Advanced Computational Biology Methods and Research
COMP 565	(4)	Machine Learning in Genomics and Healthcare
COMP 579	(4)	Reinforcement Learning
COMP 585	(4)	Intelligent Software Systems
COMP 588	(4)	Probabilistic Graphical Models
COMP 618	(3)	Bioinformatics: Functional Genomics
COMP 652	(4)	Machine Learning
COMP 654	(4)	Graph Representation Learning
COMP 680	(4)	Mining Biological Sequences
COMP 766	(4)	Advanced Topics Applications 1
COMP 767	(4)	Advanced Topics: Applications 2

#### 11.4.5 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
	(12)	Thesis Research 5

**11.4.6 Master of Science (M.Sc.) Computer Science (Non-Thesis) (45 credits)**

The M.Sc. in Computer Science; Non-Thesis offers an in depth study of advanced topics in computer science, mainly through course-based work. The program includes the possibility to complete a short research project or to conduct an internship for practical experience.

**Required Courses (2 credits)**

COMP 602	(1)	Computer Science Seminar 1
COMP 603	(1)	Computer Science Seminar 2

**Complementary Courses (43 credits)**

Choose either: project courses and course work; or internship and course work; or all course work.

**Research Project**

0-15 credits from:

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

**Internship**

0-15 credits from:

COMP 689	(15)	Internship in Computer Science
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**Course Work**

28-43 credits of lecture- or seminar-based COMP courses at the 500 level or higher.

The following courses outside of the School of Computer Science may count towards the complementary courses, subject to approval by an academic adviser.

ECSE 507	(3)	Optimization and Optimal Control
ECSE 508	(3)	Multi-Agent Systems
ECSE 516	(3)	Nonlinear and Hybrid Control Systems
ECSE 518	(3)	Telecommunication Network Analysis
ECSE 523	(3)	Speech Communications
ECSE 526	(3)	Artificial Intelligence
ECSE 539	(4)	Advanced Software Language Engineering
ECSE 542	(4)	Human Computer Interaction
ECSE 546	(4)	Advanced Image Synthesis
ECSE 551	(4)	Machine Learning for Engineers
ECSE 552	(4)	Deep Learning
ECSE 556	(4)	Machine Learning in Network Biology
ECSE 570	(3)	Automatic Speech Recognition
ECSE 626	(4)	Statistical Computer Vision
MATH 523	(4)	Generalized Linear Models
MATH 524	(4)	Nonparametric Statistics
MATH 533	(4)	Regression and Analysis of Variance
MATH 559	(4)	Bayesian Theory and Methods
MATH 563	(4)	Honours Convex Optimization

MATH 578	(4)	Numerical Analysis 1
MATH 680	(4)	Computation Intensive Statistics
MECH 513	(3)	Control Systems

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

Required coursework: Students must take eight graduate courses, of which at least five are computer science courses. These courses should be chosen by the student in consultation with the supervisor (or co-supervisor) and the Progress 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

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 525	(3)	Formal Verification
COMP 531	(3)	Advanced Theory of Computation
COMP 540	(4)	Matrix Computations
COMP 547	(4)	Cryptography and Data Security
COMP 549	(3)	Brain-Inspired Artificial Intelligence
COMP 552	(4)	Combinatorial Optimization
COMP 554	(4)	Approximation Algorithms
COMP 561	(4)	Computational Biology Methods and Research
COMP 562	(4)	Theory of Machine Learning
COMP 564	(3)	Advanced Computational Biology Methods and Research
COMP 565	(4)	Machine Learning in Genomics and Healthcare
COMP 566	(3)	Discrete Optimization 1
COMP 567	(3)	Discrete Optimization 2
COMP 588	(4)	Probabilistic Graphical Models
COMP 598	(3)	Topics in Computer Science 1
COMP 599	(4)	Topics in Computer Science 2
COMP 610	(4)	Information Structures 1
COMP 611	(4)	Mathematical Tools for Computer Science
COMP 618	(3)	Bioinformatics: Functional Genomics
COMP 642	(4)	Numerical Estimation Methods
COMP 647	(4)	Advanced Cryptography
COMP 649	(4)	Quantum Cryptography



COMP 654	(4)	Graph Representation Learning
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

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

### Complementary Courses

Two courses chosen from the following:

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

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

## 11.5 Earth and Planetary Sciences

### 11.5.1 Location

Department of Earth and Planetary Sciences  
 Frank Dawson Adams Building  
 3450 University Street  
 Montreal QC H3A 0E8  
 Telephone: 514-398-6767  
 Email: [grad.eps@mcgill.ca](mailto:grad.eps@mcgill.ca)  
 Website: [mcgill.ca/eps](http://mcgill.ca/eps)

### 11.5.2 About Earth and Planetary Sciences

The Department of Earth and Planetary Sciences offers both **M.Sc.** and **Ph.D.** degree programs. Graduate programs are based on research, although some courses are required to build the backgrounds of students. Research in the Department is wide-ranging, and includes:

- the geochemistry of the mantle;
- the nature of processes concentrating metals in hydrothermal mineral deposits;
- the controls of viscosity in magmas and the mechanisms of volcanic eruption;
- the fate of carbon and trace metals in marine sediments;
- the nature of changes in atmospheric and oceanic chemistry during Earth's history;
- earthquakes and fault mechanisms;
- geomicrobiology;
- the movement of water and nutrients within complex ecohydrological systems;
- wetland hydrogeology;
- interactions between the cryosphere, solid Earth, and climate systems;
- global human processes and their relationship to planetary boundaries.

There is a very substantial interdisciplinary basis to much of the research.

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

Financial assistance is available in the form of teaching assistantships, graduate student stipends, and scholarships.

**Areas of Research :**

**Aquatic Geochemistry**

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

**Biogeochemistry**

Response of the marine ecosystem to climate change and anthropogenic stresses through observations of the modern ocean, and experimental and numerical simulations of ocean biogeochemistry. Reconstructions of past climate change using sediments from lacustrine, coastal, and marine sediments. The processes controlling carbon cycling in freshwater environments, including the burial of organic matter in sediments and the production of greenhouse g

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

*section 11.5.4: Master of Science (M.Sc.) Earth and Planetary Sciences (Thesis) (45 credits)*

The nature of graduate research in the Department of Earth and Planetary Sciences is highly variable. As a result, students may enter the graduate program with backgrounds in earth sciences, chemistry, or physics, depending on their research interests and the supervisor with whom they wish to work. Students pursuing on an

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.

## **11.5.5 Doctor of Philosophy (Ph.D.) Earth and Planetary Sciences**

Highly qualified B.Sc. graduates may be admitted directly to the Ph.D. 1 year. Students with the M.Sc. degree are normally admitted to the Ph.D. 2 year.

\* Students are required to take four graduate-level courses in the Ph.D. 1 year, and two courses plus a comprehensive oral examination in the Ph.D. 2 year.

### **Thesis**

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

### **Required Courses**

EPSC 700	(0)	Preliminary Doctoral Examination
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### **Complementary Courses**

Two to six courses (6 to 18 credits) approved at the 500, 600, or 700 level selected in consultation with the student's supervisor and approved by the Academic Standing Committee.

## **11.6 Geography**

### **11.6.1 Location**

Department of Geography  
 Burnside Hall  
 805 Sherbrooke Street West, Room 305  
 Montreal QC H3A 0B9  
 Canada  
 Telephone: 514-398-4111  
 Email: [grad.geo](mailto:grad.geo)



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

***section 11.6.4: 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 11.6.5: Master of Science (M.Sc.) Geography (Thesis): Environment (45 credits)***

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

The Environment option is offered in association with the [Bieler School of Environment](#) (BSE) 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 11.6.6: 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 [Bieler 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***

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

### **11.6.3 Geography Admission Requirements and Application Procedures**

#### **11.6.3.1 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 Geography in certain circumstances. In general, applicants who have deficiencies in their preparation but are otherwise judged to be acceptable, will be required to register for a Qualifying program or to undertake additional courses.

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

Students who have completed a master's degree in Geography or a related discipline (with high standing) may be admitted at the Ph.D. 2 level.

On rare occasions, a student may be admitted to the Ph.D. degree without having first taken the master's degree. These students, who have deficiencies in their preparation but are otherwise acceptable, will be required to re



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

### **11.6.5 Master of Science (M.Sc.) Geography (Thesis): Environment (45 credits)**

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

The Environment Option is offered in association with the Bieler 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
		MENVR 652

### **Complementary Course (3 credits)**

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

### **Elective Course (3 credits)**

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

## **11.6.7 Doctor of Philosophy (Ph.D.) Geography**

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

### **Thesis**

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

### **Required Courses**

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

### **Complementary Courses**

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

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

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

The Ph.D. in Geography Environment is a research program offered in collaboration with the Bieler School of Environment. As a complement to the unit's expertise, the program considers how various dimensions (scientific, social, legal, ethical) interact to define environment and sustainability issues.

### **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 e

ENVR 614 (3) Mobilizing Research for Sustainability

0-3 credits chosen from:

ENVR 585 (3) Readings in Environment 2  
(3) Civilization and Environment

GEOG 700	(0)	Comprehensive Examination 1
GEOG 701	(0)	Comprehensive Examination 2
GEOG 702	(0)	Comprehensive Examination 3

### Elective Courses

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

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## 11.7 Mathematics and Statistics

### 11.7.1 Location

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

### 11.7.2 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 (M.A. or M.Sc.) and Ph.D. degrees. The research areas are:

- Algebra;
- Algebraic Geometry;
- Analysis;
- Category Theory;
- Data Science;
- Discrete Mathematics;
- Differential Geometry;
- Dynamical Systems;
- Geometric Group Theory;
- Logic;
- Mathematical Biology;
- Mathematical Economics;
- Mathematical Physics;
- Mathematics of Machine Learning;
- Number Theory;
- Numerical Analysis;
- Optimization;
- Partial Differential Equations;
- 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 Ph.D. program in Mathematics and Statistics is thesis only.

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 Master of Arts (M.A.) in Mathematics and Statistics (Thesis) is an advanced program for students working in the areas of Applied Mathematics, Pure Mathematics, and Statistics. The thesis option requires a thesis and six approved courses.

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

The Master of Arts (M.A.) in Mathematics and Statistics (Non-Thesis) is an advanced program for students working in the areas of Applied Mathematics, Pure Mathematics, and Statistics. The non-thesis option requires a project, that is a shorter work than a thesis, 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 11.7.4: Master of Science \(M.Sc.\) Mathematics and Statistics \(Thesis\) \(45 credits\)](#)**

The Master of Science (M.Sc.) in Mathematics and Statistics (Thesis) is an advanced program for students working in the areas of Applied Mathematics, Pure Mathematics, and Statistics. The thesis option requires a thesis and six approved courses.

##### **[section 11.7.5: Master of Science \(M.Sc.\) Mathematics and Statistics \(Non-Thesis\) \(45 credits\)](#)**

The Master of Science (M.Sc.) in Mathematics and Statistics (Non-Thesis) is an advanced program for students working in the areas of Applied Mathematics, Pure Mathematics, and Statistics. The non-thesis option requires a project, that is a shorter work than a thesis, and eight approved courses.

#### **Ph.D. Programs in Mathematics and Statistics**

##### **[: 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 (usually a member of the Progress Tracking Committee), 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 the Ph.D. Qualifying Examination.

### **11.7.3 Mathematics and Statistics Admission Requirements and Application Procedures**

#### **11.7.3.1 Admission Requirements**

In addition to the general Graduate and Postdoctoral Studies requirements, the Department requirements are as follows:

##### **Master's Degree**

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

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

Applicants wishing to concentrate in statistics should have a strong background in linear algebra and basic real analysis. A calculus-based course in probability and one in statistics are required, as well as some knowledge of computer programming. Some knowledge of numerical analysis and optimization is desirable.

Applicants wishing to concentrate in applied mathematics should have a strong background in most of the areas of linear algebra, analysis, differential equations, discrete mathematics, and numerical analysis. Some knowledge of computer programming is also desirable.

Students whose preparation is insufficient for the program they wish to enter may, exceptionally, be admitted to a Qualifying year.

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

A master's degree with high standing is required, in addition to the requirements listed above for the master's program. Students may transfer directly from the master's program to the Ph.D. program under certain conditions. Students without a master's degree, but with exceptionally strong undergraduate training, may be admitted directly to Ph.D. 1.



## Required Courses

MATH 701 (0) Ph.D. Qualifying Examination

## Complementary Courses (21 credits)

21 credits of courses at the 500 level or above, including at least 6 credits at the 600 level or above. The choice of courses to fulfill this requirement must be prior approved by the student's Advisory Committee. The Department recommends that students take complementary courses in at least three different areas of Mathematics and Statistics.

All credits of complementary courses should be taken before the end of PhD 3. In exceptional circumstances, an extension can be granted by the student's Advisory Committee.

Students who wish to take more than 8 credits of complementary courses from outside the Department should request approval from the Graduate Program Director.

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## 11.8 Physics

### 11.8.1 Location

Department of Physics  
Ernest Rutherford Physics Building  
3600 University Street  
Montreal QC H3A 2T8  
Canada  
Telephone: 514-398-6485 (Graduate Information)  
Fax: 514-398-8434  
Email: [graduate.physics@mcgill.ca](mailto:graduate.physics@mcgill.ca)  
Website: [physics.mcgill.ca](http://physics.mcgill.ca)

### 11.8.2 About Physics

The Department of Physics currently has a faculty of approximately 40 members, including sev

Departmental researchers enjoy technical support in the areas of engineering, electronics, and precision machining. The Department maintains an excellent conventional machine shop as well as the McGill Nanotools-Microfab facility. Most of the scientific computing is done with an extensive in-house network of powerful workstations and several Beowulf clusters.

Remote access to supercomputing sites in Canada and the United States is also possible including the McGill HPC super-computing facility which is a part of the nationwide network of high performance computing installations in Quebec.

The Department of Physics offers a competitive funding package for both local and international students. For more information about financial support, please [physics.mcgill.ca/grads/finance.html](http://physics.mcgill.ca/grads/finance.html).

Graduate students in the Department of Physics come from many different countries and cultural backgrounds, providing a stimulating cosmopolitan atmosphere in the Department. This, coupled with the unique opportunities af





See [University Regulations & Resources](#) > *Gr*

Candidates must successfully complete two 3-credit graduate courses at the 600 level or above; one of these courses should be in the candidate's area of specialization. If the candidate completed two or more courses at the 600 level as part of the McGill Physics M.Sc. program, then one of these courses may be used as a substitute for one of the required courses. In all cases, candidates must also pass the Ph.D. preliminary examination (PHYS 700).

PHYS 700 (0) Preliminary Ph.D. Examination

## 11.9 Psychology

### 11.9.1 Location

Department of Psychology  
2001 McGill College Avenue, 7th Floor  
Montreal QC H3A 1G1  
Canada  
Telephone: 514-398-6127/514-398-6137  
Email: [psychology.grad@mcgill.ca](mailto:psychology.grad@mcgill.ca)  
Website: [mcgill.ca/psychology](http://mcgill.ca/psychology)

### 11.9.2 About Psychology

The aim of the Experimental program is to provide students with an environment in which they are free to develop skills and expertise that will serve during a professional career of teaching and research as a psychologist. Coursework and other requirements are at a minimum. Success in the program depends on the student's ability to organize unscheduled time for self-education. Continuous involvement in research planning and execution is considered a very important component of the student's activities.

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

Research interests of members of the Psychology Department include:

- behavioural neuroscience;
- clinical psychology;
- cognition and cognitive neuroscience;
- developmental science;
- health psychology;
- quantitative psychology and modelling; and
- social and personality psychology.

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



**Note:** Many MUHC-affiliated hospitals and institutes are now located at the Glen site; further information is available on the [MUHC website](#).

For inquiries about all programs and financial aid, and for application forms, contact the [Graduate Program Administrator](#).

#### Ph.D. Option in Behavioural Neuroscience

Information about this option is available from the Department and at [mcgill.ca/psychology/graduate/program-tracks](http://mcgill.ca/psychology/graduate/program-tracks).

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

Information about this option is available from the Department and at [psych.mcgill.ca/lap.html](http://psych.mcgill.ca/lap.html) and [mcgill.ca/psychology/graduate/program-tracks/experimental/additional-program-opportunities](http://mcgill.ca/psychology/graduate/program-tracks/experimental/additional-program-opportunities).

#### **: 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.

#### *section 11.9.4: 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 11.9.6: 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 11.9.7: 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.

### 11.9.3 Psychology Admission Requirements and Application Procedures

#### 11.9.3.1 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 Major 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.

The *GRE* General Test as well as the Psychology Subject Test are not mandatory, but if you wish to take either or both, your scores can be submitted to us and will be added to your application.



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

#### English Language Proficiency

For graduate applicants whose mother tongue is not English, and who have not completed an undergraduate or graduate degree from a recognized Canadian or American (English or French) institution or from a recognized foreign institution where English is the language of instruction, documented proof of English proficiency is required prior to admission. For a list of acceptable test scores and minimum requirements, visit [mcgill.ca/gradapplicants/international/proficiency](http://mcgill.ca/gradapplicants/international/proficiency).

#### 11.9.3.2 Application Procedures

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

See : *Application Procedures* for detailed application procedures.

#### 11.9.3.2.1 Additional Requirements

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

- Three letters of reference

- Personal Statement
- Curriculum Vitae
- Application Summary Sheet

For further details about these additional requirements, consult the Department of Psychology's [website](#).

### 11.9.3.3 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 Psychology 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 [mcgill.ca/gps/contact/graduate-program](http://mcgill.ca/gps/contact/graduate-program).

Information on application deadlines is available at [mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines](http://mcgill.ca/gradapplicants/how-apply/application-steps/application-deadlines).

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

## 11.9.4 Master of Science (M.Sc.) Psychology (Thesis) (45 credits)

### Thesis Courses (27 credits)

PSYC 690	(15)	Masters Research 1
PSYC 699	(12)	Masters Research 2

### Required Courses (18 credits)

PSYC 601	(6)	Master's Comprehensive
PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2
PSYC 660D1	(3)	Psychology Theory
PSYC 660D2	(3)	Psychology Theory

## 11.9.5 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
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### Complementary Courses

12-24 credits

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

PSYC 712	(3)	Comparative and Physiological Psychology 3
PSYC 715	(3)	Comparative and Physiological Psychology 6
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 728	(3)	Ethics and Professional Issues
PSYC 729	(3)	Theory of Assessment
PSYC 730	(3)	Clinical Neuroscience Methods
PSYC 732	(3)	Clinical Psychology 1
PSYC 733	(3)	Clinical Psychology 2
PSYC 734	(3)	Developmental Psychology and Language
PSYC 735	(3)	Developmental Psychology and Language
PSYC 736	(3)	Developmental Psychology and Language
PSYC 740	(3)	Perception and Cognition
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
PSYC 750	(3)	Applied Bayesian Statistics
PSYC 752D1	(3)	Psychotherapy and Behaviour Change
PSYC 752D2	(3)	Psychotherapy and Behaviour Change
PSYC 753	(3)	Health Psychology Seminar 1

0-12 credits from the following (students without a master's degree from McGill need to take all 12 credits):

PSYC 650	(3)	Advanced Statistics 1
PSYC 651	(3)	Advanced Statistics 2
PSYC 660D1	(3)	Psychology Theory
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 province of Quebec will be examined based on their proficiency in French before being admitted to the professional association.

### 11.9.6 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 neurobiological 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 a Ph.D. in Psychology.



PSYC 730	(3)	Clinical Neuroscience Methods
PSYC 732D1	(1.5)	Clinical Psychology 1
PSYC 732D2	(1.5)	Clinical Psychology 1
PSYC 733D1	(1.5)	Clinical Psychology 2
PSYC 733D2	(1.5)	Clinical Psychology 2
PSYC 734	(3)	Developmental Psychology and Language
PSYC 735	(3)	Developmental Psychology and Language
PSYC 736	(3)	Developmental Psychology and Language
PSYC 740	(3)	Perception and Cognition
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
PSYC 750	(3)	Applied Bayesian Statistics
PSYC 752D1	(3)	Psychotherapy and Behaviour Change
PSYC 752D2	(3)	Psychotherapy and Behaviour Change
PSYC 753	(3)	Health Psychology Seminar 1

At least 3 credits selected from the following list:

EDSL 620	(3)	Social Justice Issues in Second Language Education
EDSL 623	(3)	Second Language Learning
EDSL 624	(3)	Educational Sociolinguistics
EDSL 627	(3)	Instructed Second Language Acquisition Research
EDSL 632	(3)	Second Language Literacy Development
LING 651	(3)	Topics in Acquisition of Phonology
LING 655	(3)	Theory of L2 Acquisition
LING 751	(3)	Advanced Seminar: Experimental 1
LING 752	(3)	Advanced Seminar: Experimental 2
PSYC 545	(3)	Topics in Language Acquisition
PSYC 735	(3)	Developmental Psychology and Language
SCSD 619	(3)	Phonological Development
SCSD 632	(3)	Phonological Disorders: Children
SCSD 637	(3)	Developmental Language Disorders 1
SCSD 643	(3)	Developmental Language Disorders 2
SCSD 652	(3)	Advanced Research Seminar 1
SCSD 653	(3)	Advanced Research Seminar 2
SCSD 654	(3)	Advanced Research Seminar 3



0-2 from the following:

EDPE 713	(2)	Language Acquisition Issues 5
EDSL 711	(2)	Language Acquisition Issues 3

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 not previously taken an equiv

### **11.10.3.2 Application Procedures**

Students in the Redpath Museum may enrol in McGill's Department of [section 11.2: Biology](#) or other units, including the Department of [section 11.5: Earth and Planetary Sciences](#), the Department of [Anthropology](#), the Department of [Natural Resource Sciences](#), or the [Faculty of Education](#). Anyone interested should contact the unit concerned.

### **11.10.3.3 Application Dates and Deadlines**

For more information, please contact the Graduate Program Coordinator in the department you are interested in.