



**Faculty of Agricultural and Environmental
Sciences, including School of Human Nutrition
(Graduate)
Programs, Courses and University Regulations
2020-2021**

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

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8.2 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), 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

- i. Postdoctoral status will be recognized by the University in accordance with Quebec pro

- i. Postdocs are subject to the responsibilities outlined at www.mcgill.ca/students/srr and must abide by the policies listed at 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 av

Students who have been granted such a leave will have to register for the term(s) in question and their registration will show as “leave of absence” on their record. No tuition fees will be charged for the duration of the authorized leave. Research supervisors are not obligated to remunerate students and Postdocs on leave. A summary table of various leave policies (paid or unpaid) for students and Postdocs paid from the Federal and Quebec Councils through fellowships or research grants is available at www.mcgill.ca/gps/funding/getting-paid under “Leave Policies and Form.”

8.5 Postdoctoral Research Trainees

Eligibility

If your situation does not conform to the Government of Quebec's definition of a Postdoctoral Fellow, you may be eligible to attend McGill as a Postdoctoral Research Trainee. While at McGill, you can perform research only (you may not register for courses or engage in clinical practice). Medical specialists who will have clinical exposure and require a training card must register through Postgraduate Medical Education of the Faculty of Medicine—not Graduate and Postdoctoral Studies.

The category of Postdoctoral Research Trainee is for:

Category 1: An individual who has completed requirements for the Doctoral degree or medical specialty, but whose degree/certification has not yet been awarded. An individual in this category will subsequently be eligible for registration as a Postdoctoral Fellow.

Category 2: An individual who is not eligible for Postdoctoral Registration according to the Government of Quebec's definition, but is a recipient of an external postdoctoral award from a recognized Canadian funding agency.

Category 3: An individual who holds a professional degree (or equivalent) in a regulated health profession (as defined under CIHR-eligible health profession) and is enrolled in a program of postgraduate medical education at another institution. This individual wishes to conduct the research stage or elective component of his/her program of study at McGill University under the supervision of a McGill professor. This individual will be engaged in full-time research with well-defined objectives, responsibilities, and methods of reporting. Applications must be accompanied by a letter of permission from the applicant's home institution (signed by the Department Chair, Dean, or equivalent) confirming registration in their program and stating the expected duration of the 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

9 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

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

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

Website: www.mcgill.ca/nrs/graduate-students/graduate/agricultural-economics

12.1.2 About Agricultural Economics

The goal of graduate training in Agricultural Economics is to provide students with the applied concepts and tools to identify, define, and analyze economic problems affecting the performance of the agri-food sector and the environment. Attention is given to:

- the development of analytical skills in Applied Economics related to agriculture, environment, and ecological economics;
- Environmental and Resource Economics;
- International Agricultural Development;
- Farm Management, Production, and Finance.

The program prepares graduates for rewarding careers in research, analysis, and decision-making in academia; private and NGO sectors; and government. For more information on the

Application Opening Dates		Application Deadlines		
Summer Term:	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. International applicants are advised to apply well in advance of these dates because immigration procedures may be lengthy.

12.1.4 Agricultural Economics Faculty

Program Director

P.J. Thomassin

Associate Professors

N. Kosoy; B.Sc.(USB), M.Sc., Ph.D.(Autonoma, Barcelona)

P.J. Thomassin; B.Sc.(Agr.)(McG.), M.S., Ph.D.(Hawaii Pac.)

Assistant Professor

A.P. Harou; B.S.(Sus.), M.S.(Calif., Davis), Ph.D.(Cornell)

Associate Member

C. Barrington-Leigh; S.M.(MIT), Ph.D.(Stan.), Ph.D.(Br. Col.)

12.2 Animal Science

12.2.1 Location

Department of Animal Science
Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue QC H9X 3V9
Canada
Telephone: 514-398-7838
Email: gradstudies.macdonald@mcgill.ca
Website: www.mcgill.ca/animal

12.2.2 About Animal Science

The Department of Animal Science provides exciting challenges to graduate students in the areas of:

- Animal Breeding and Genetics
- Animal Models for Human Medical Applications
- Dairy Cattle Welfare
- Epigenetic Modelling
- Food Safety
- Genome Editing (CRISPR tools)
- Large-data Analyses
- Metabolomics
- Reproductive Physiology
- Ruminant and Non-ruminant Nutrition and Metabolism

as they relate, not only to livestock production, but also leading into the fields of human nutrition and medicine via animal models for human disease, infertility, and obesity. Official options in Biotechnology are also available.

Departmental researchers have excellent wet-lab facilities at their disposal; large-animal studies can be carried out at the Large Animal Research Unit on the Macdonald campus farm, where other livestock species are available for research trials as well. Research can make use of the Small Animal Research Unit for studies involving rodent animal models, guinea pigs, neonatal piglets, and rabbits. Expertise is also available in applied information systems, management-software development, and large-scale data analyses. Close collaboration with the *Quebec Centre for Expertise in Dairy Production (Valacta)* allows for large-scale data-mining projects, software development, and the production of advising tools for the industry. The Department also has significant expertise in food safety, environmental studies related to animal production, and global food security. Our staff's many connections via research networks allow for rich learning environments for our graduate students.

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

Two one-semester courses and three seminar courses at the postgraduate level complement an area of research (resulting in a thesis) under the supervision of one of our staff—many of whom are leaders in their respective fields. Entrance to this program is highly competitive, requiring an excellent B.Sc. and letters of reference. Graduates of this program are well prepared for careers in the animal industry, the pharmaceutical sector, and many varied fields in biotechnology.

section 12.2.6: Master of Science, Applied (M.Sc.A.) Animal Science (Non-Thesis) (45 credits)

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

section 12.2.7: Master of Science, Applied (M.Sc.A.) Animal Science (Non-Thesis): Sustainable Agriculture (45 credits)

Climate change and rising human population have increased the need for sustainable agricultural practices. The Sustainable Agriculture option is taken with a M.Sc. Applied (Non-Thesis) program, and designed for students who wish to supplement their basic degree with graduate studies in animal science, with a specific focus on sustainability in agriculture. Students will be exposed to different approaches to improve the sustainability of agricultural systems through specialized coursework and a research project. The program aims to provide graduate training in applied areas of animal production with a view toward integrating technology and management in sustainable animal production with allied areas of agricultural resource utilisation.

section 12.2.8: Doctor of Philosophy (Ph.D.) Animal Science

Since the Ph.D. is primarily a research degree, the amount of coursework required will normally be considerably less than is the case for the M.Sc. It depends on the background of the individual student and must be approved by the student's advisory committee.

Complementary Courses (30 credits)

15-30 credits from the following:

AEMA 610	(3)	Statistical Methods 2
ANSC 504	(3)	Population Genetics
ANSC 530	(3)	Experimental Techniques in Nutrition
ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
ANSC 560	(3)	Biology of Lactation
ANSC 565	(3)	Applied Information Systems
ANSC 600	(3)	Advanced Eukaryotic Cells and Viruses
ANSC 604	(3)	Advanced Animal Biotechnology
ANSC 605	(3)	Estimation: Genetic Parameters
ANSC 606	(3)	Selection Index and Animal Improvement
ANSC 622	(3)	Experimental Techniques in Animal Science
ANSC 635	(3)	Vitamins and Minerals in Nutrition
ANSC 636	(3)	Analysis - Animal Breeding Research Data
ANSC 691	(3)	Special Topic: Animal Sciences
ANSC 692	(3)	Topic in Animal Sciences 1

0-15 credits selected from 500- and 600-level courses from across the Faculty (with the possibility of up to 9 credits from outside the Faculty if deemed appropriate by the supervisor).

12.2.7 Master of Science, Applied (M.Sc.A.) Animal Science (Non-Thesis): Sustainable Agriculture (45 credits)

** NEW PROGRAM **

Climate change and rising human population have increased the need for sustainable agricultural practices. The Sustainable Agriculture option is taken with a M.Sc. Applied (Non-Thesis) program, and designed for students who wish to supplement their basic degree with graduate studies in animal science, with a specific focus on sustainability in agriculture. Students will be exposed to different approaches to improve the sustainability of agricultural systems through specialized coursework and a research project. The program aims to provide graduate training in applied areas of animal production with a view toward integrating technology and management in sustainable animal production with allied areas of agricultural resource utilization.

Research Project (15 credits)

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

Required Courses (12 credits)

ANSC 555	(3)	The Use and Welfare of Animals
BREE 533	(3)	Water Quality Management
IGFS 611	(3)	Advanced Issues on Development, Food and Agriculture
PLNT 602	(3)	Advances in Agronomy

Complementary Courses (18 credits)

3 credits from the following list:

AEMA 610	(3)	Statistical Methods 2
AEMA 611	(3)	Experimental Designs 1
AEMA 614	(3)	Temporal and Spatial Statistics 1

9-15 credits from the following list:

ANSC 530	(3)	Experimental Techniques in Nutrition
ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
ANSC 560	(3)	Biology of Lactation
ANSC 565	(3)	Applied Information Systems
ANSC 604	(3)	Advanced Animal Biotechnology
ANSC 611D1	(1.5)	Advanced Reproductive Biology
ANSC 611D2	(1.5)	Advanced Reproductive Biology
ANSC 622	(3)	Experimental Techniques in Animal Science
ANSC 635	(3)	Vitamins and Minerals in Nutrition
ANSC 637	(3)	Livestock Breeding Systems
FDSC 545	(3)	Advances in Food Microbiology
PLNT 662	(3)	Advances in Plant Biotechnology

0-6 credits of sufficient 500-, or 600-level courses (with Adviser's approval) to bring the total credits to 45.

12.2.8 Doctor of Philosophy (Ph.D.) Animal Science

Since the Ph.D. is primarily a research degree, the amount of coursework required will depend on the background of the individual student, and must be approved by the student's advisory 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

ANSC 701	(0)	Doctoral Comprehensive Examination
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Two seminar courses at the 500, 600, or 700 level.

12.2.9 Doctor of Philosophy (Ph.D.) Animal Science: Bioinformatics

Thesis

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

Required Courses (5 credits)

ANSC 701	(0)	Doctoral Comprehensive Examination
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ANSC 797	(1)	Animal Science Seminar 3
ANSC 798	(1)	Animal Science Seminar 4
COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar

Complementary Courses (6 credits)

Two courses chosen from the following:

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

Additional courses at the 500, 600, or 700 level may be required at the discretion of the candidate's supervisory committee.

12.3 Bioresource Engineering

12.3.1 Location

Department of Bioresource Engineering
 Macdonald Campus
 21,111 Lakeshore Road
 Sainte-Anne-de-Bellevue QC H9X 3V9
 Canada
 Telephone: 514-398-7838
 Email: gradstudies.macdonald@mcgill.ca
 Website: www.mcgill.ca/bioeng

12.3.2 About Bioresource Engineering

The Department offers M.Sc. and Ph.D. research programs in various areas of bioresource engineering including:

- plant and animal environments;
- ecological engineering (ecosystem modelling, design, management, and remediation);
- water resources management (hydrology, irrigation, drainage, water quality);
- agricultural machinery, mechatronics, and robotics;
- food engineering and bio-processing;
- post-harvest technology;
- waste management and protection of the environment;
- bio-energy;
- artificial intelligence.

The Department has well-equipped laboratories for conducting research in all these areas.

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

section 12.3.5: Master of Science (M.Sc.) Bioresource Engineering (Thesis) (46 credits)

This option for the M.Sc. degree is oriented toward individuals who intend to develop a career in bioresource engineering research. The research areas include: plant and animal environments; ecological engineering (ecosystem modelling, design, management and remediation); water resources management

section 12.3.5: Master of Science (M.Sc.) Bioresource Engineering (Thesis) (46 credits)

(hydrology, irrigation, drainage, water quality); agricultural machinery, mechatronics and robotics; food engineering and bio-processing; post-harvest technology; waste management and protection of the environment; bio-energy; and artificial intelligence.

section 12.3.6: Master of Science (M.Sc.) Bioresource Engineering (Thesis): Environment (46 credits)

The Environmental option is coordinated through the McGill School of Environment (MSE). This option is intended for students who want to take an interdisciplinary approach in their graduate research on environmental issues. Students will learn how to transfer knowledge into action and develop an appreciation for the roles of science, politics, economics, and ethics with regard to the environment.

section 12.3.7: Master of Science (M.Sc.) Bioresource Engineering (Non-Thesis): Integrated Water Resources Management (45 credits)

Integrated Water Resource Management is a one-year program providing an essential approach for sustainable management of our natural watershed resources. The 13-credit internship is a central feature of this master's program. The degree gives students the unique opportunity to study the biophysical, environmental, legal, institutional, and socio-economic aspects of water use and management, in an integrated context. The degree is directed at practising professionals who wish to upgrade and/or focus their skill set to address water management issues.

As a graduate from this program, you will be well suited to opportunities in diverse fields of employment, such as water resources consulting, international development project management, research with governments or universities, public policy and governance development, and climate change impact assessment.

section 12.3.8: Master of Science, Applied (M.Sc.A.) Bioresource Engineering (Non-Thesis) (45 credits)

The non-thesis option is aimed at individuals already employed in industry or seeking to improve their skills in specific areas (soil and water, structures and environment, waste management, environment protection, post-harvest technology, food process engineering, environmental engineering) in order to attain a higher level of engineering qualification. Candidates must be qualified to be members of a Canadian professional engineering association such as the *Ordre des ingénieurs du Québec* (OIQ) and must maintain contact with their academic adviser in the Department of Bioresource Engineering before registration to clarify objectives, investigate project possibilities, and plan a program of study.

section 12.3.9: Master of Science, Applied (M.Sc.A.) Bioresource Engineering (Non-Thesis): Environment (45 credits)

The non-thesis Environment option is aimed at individuals already employed in industry or seeking to improve their skills in specific areas with the coordination of the McGill School of Environment.

section 12.3.10: Master of Science, Applied (M.Sc.A.) Bioresource Engineering (Non-Thesis): Environmental Engineering (45 credits)

The Environmental Engineering program emphasizes interdisciplinary fundamental knowledge, practical perspective, and awareness of environmental issues through a wide range of technical and non-technical courses of

section 12.3.13: Doctor of Philosophy (Ph.D.) Bioresource Engineering: Environment

The Ph.D. Bioresource Engineering: Environment – MSE Option is coordinated through the McGill School of Environment (MSE). This option is intended for students who want to take an interdisciplinary approach in their graduate research on environmental issues. Students will learn how to transfer knowledge into action and develop an appreciation for the roles of science, politics, economics, and ethics with regard to the environment.

12.3.3 Bioresource Engineering Admission Requirements and Application Procedures

12.3.3.1 Admission Requirements

The general rules of Graduate and Postdoctoral Studies apply. Candidates should indicate in some detail their fields of special interest when applying for

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)
	March 15	March 15	March 15

Adjunct Professors

Boris Tartakovsky; M.Sc., Ph.D.(Moscow St.)

Faculty Lecturers

Alice Cherestes; B.Sc., M.Sc.(QC, CUNY), Ph.D.(CUNY)

David Titley-Peloquin; B.Sc., Ph.D.(McG.)

Research/Academic Associates

Yvan Gariépy; B.Sc., M.Sc.(McG.)

Ebenezer Kwofie; B.Sc.(KNUST), M.Sc.(Borås), Ph.D.(McG.)

Li (Laura) Liu; B.Sc., M.Sc.(Harbin Inst. Tech.), Ph.D.(PolyU, Hong Kong)

Darwin Lyew; B.Sc., M.Sc., Ph.D.(McG.)

Technical

Scott Manktelow

12.3.5 Master of Science (M.Sc.) Bioresource Engineering (Thesis) (46 credits)

This option for the M.Sc. degree is oriented toward individuals who intend to develop a career in bioresource engineering research.

Thesis Courses (32 credits)

BREE 691	(4)	M.Sc. Thesis 1
BREE 692	(4)	M.Sc. Thesis 2
BREE 693	(4)	M.Sc. Thesis 3
BREE 694	(4)	M.Sc. Thesis 4
BREE 695	(4)	M.Sc. Thesis 5
BREE 696	(4)	M.Sc. Thesis 6
BREE 697	(4)	M.Sc. Thesis 7
BREE 698	(4)	M.Sc. Thesis 8

Required Courses (5 credits)

BREE 696	(4)	M.Sc. Thesis 6
BREE 697	(4)	M.Sc. Thesis 7
BREE 698	(4)	M.Sc. Thesis 8

Required Courses (11 credits)

BREE 651	(1)	Departmental Seminar M.Sc. 1
BREE 652	(1)	Departmental Seminar M.Sc. 2
BREE 699	(3)	Scientific Publication
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 (3 credits)

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 500-, 600-, or 700-level course recommended by the Advisory Committee and approved by the Environment Option Committee.

12.3.7 Master of Science (M.Sc.) Bioresource Engineering (Non-Thesis): Integrated Water Resources Management (45 credits)**Research Project (6 credits)**

BREE 631	(6)	Integrated Water Resources Management Project
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Required Courses (27 credits)

BREE 503	(3)	Water: Society, Law and Policy
BREE 510	(3)	Watershed Systems Management
BREE 630	(13)	Integrated Water Resources Management Internship
BREE 651	(1)	Departmental Seminar M.Sc. 1
BREE 652	(1)	Departmental Seminar M.Sc. 2
BREE 655	(3)	Integrated Water Resources Management Research Visits
PARA 515	(3)	Water, Health and Sanitation

Elective Courses (12 credits)

12 credits, at the 500 level or higher, of any relevant course(s) chosen in consultation with the Program Director.

12.3.8 Master of Science, Applied (M.Sc.A.) Bioresource Engineering (Non-Thesis) (45 credits)

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

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

Each candidate for this option is expected to establish and maintain contact with his/her academic adviser in the Department of Bioresource Engineering some time before registration in order to clarify objectives.

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 Options Committee.

22 additional credits of 500-level or higher chosen in consultation with the academic adviser.

12.3.10 Master of Science, Applied (M.Sc.A.) Bioresource Engineering (Non-Thesis): Environmental Engineering (45 credits)

This inter-departmental graduate program leads to a master's degree in Environmental Engineering. The objective of the program is to train environmental professionals at an advanced level. The program is designed for individuals with an undergraduate degree in engineering. This non-thesis degree falls within the M.Eng. and M.Sc. programs which are offered in the Departments of Bioresource, Chemical, Civil, and Mining, Metals, and Materials Engineering.

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or an approv

Minimum of 3 credits selected from the following:

AGEC 630	(3)	Food and Agricultural Policy
AGEC 633	(3)	Environmental and Natural Resource Economics
AGEC 642	(3)	Economics of Agricultural Development
AGRI 510	(3)	Professional Practice

Minimum of 3 credits selected from the following:

BTEC 502	(3)	Biotechnology Ethics and Society
FDSC 519	(3)	Advanced Food Processing
FDSC 535	(3)	Food Biotechnology
FDSC 538	(3)	Food Science in Perspective
GEOG 515	(3)	Contemporary Dilemmas of Development
NUTR 501	(3)	Nutrition in Developing Countries

9 credits of any relevant graduate-level course chosen in consultation with the Program Director.

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 (3 credits)

Note: BREE 701, the comprehensive component, must be taken either late in the first, or early in the second, registration year to qualify to proceed to the completion of the Ph.D. degree.

BREE 701	(0)	Ph.D. Comprehensive Examination
BREE 751	(0)	Departmental Seminar Ph.D. 1
BREE 752	(0)	Departmental Seminar Ph.D. 2
BREE 753	(0)	Departmental Seminar Ph.D. 3
BREE 754	(0)	Departmental Seminar Ph.D. 4
ENVR 615	(3)	Interdisciplinary Approach Environment and Sustainability

Complementary Courses (6 credits)

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.

12.4 Biotechnology

12.4.1 Location

Institute of Parasitology
Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue QC H9X 3V9
Canada
Telephone: 514-398-7838
Email: gradstudies.macdonald@mcgill.ca
Website: www.mcgill.ca/biotechgradprog

12.4.2 About Biotechnology

The non-thesis M.Sc.(Applied) degree in Biotechnology offers a course-based curriculum with practical training in laboratory courses and internships offered through the Institute of Parasitology. The Institute is housed on Macdonald Campus of McGill University in beautiful Sainte-Anne-de-Bellevue about 30 kilometres from the Montreal main campus downtown.

Graduates typically enter the biotechnology sector in research, management, or sales, or accept government positions.

Biotechnology Programs

section 12.4.5: Master of Science, Applied (M.Sc.A.) Biotechnology (Non-Thesis) (45 credits)

Candidates must possess a bachelor's degree in the biological/molecular sciences or an equivalent program. This applied master's program is unique in Quebec. It aims to prepare students for entry into the biotechnology and pharmaceutical industry or equip them to pursue further graduate studies in

section 12.4.5: Master of Science, Applied (M.Sc.A.) Biotechnology (Non-Thesis) (45 credits)

biomedicine, agriculture, or the environment. Students can choose from a wide range of complementary courses given throughout the McGill campuses to “design” their own program toward a future career choice. The program provides in-house training in molecular biology with a strong focus on the molecular/biochemical sciences. Concurrently, it provides teaching in management and gives students the opportunity to look at the business aspect of biotechnology.

A research internship of four to eight months is carried out in an active laboratory, and students learn to present and write research results. Graduates will find jobs ranging from positions as research assistants and/or technicians in biomedical or pharmaceutical laboratories to managerial or supervisory positions. They may also pursue a career in the business of biotechnology including patent and intellectual property management.

section 12.4.6: Graduate Certificate (Gr. Cert.) Biotechnology (16 credits)

This program is not currently offered.

Candidates must possess a bachelor's degree in the biological/molecular sciences or an equivalent program. This is a short, intense program for students wishing to deepen their understanding of biotechnology and gain hands-on experience via an intensive laboratory course using the latest molecular biology techniques. Students can choose from a wide range of complementary courses given throughout the McGill campuses to “design” their own program toward a future career choice. Graduates will find employment in research or industrial laboratories as assistants and/or technicians.

12.4.3 Biotechnology Admission Requirements and Application Procedures

12.4.3.1 Admission Requirements

Candidates for the M.Sc.(Applied) in Biotechnology must possess a bachelor's degree in biological sciences or equiv

International applicants are advised to apply well in adv

BTEC 555	(3)	Structural Bioinformatics
BTEC 691	(3)	Biotechnology Practicum
EXMD 511	(3)	Joint Venturing with Industry
EXMD 602	(3)	Techniques in Molecular Genetics

Health

EXMD 610	(3)	Molecular Methods in Medical Research
PARA 635	(3)	Cell Biology and Infection
PHGY 518	(3)	Artificial Cells

Environment and Food

BREE 530	(3)	Fermentation Engineering
FDSC 535	(3)	Food Biotechnology

12.5 Food Science and Agricultural Chemistry

12.5.1 Location

Department of Food Science and Agricultural Chemistry
 Macdonald-Stewart Building, Room MS1-033
 Macdonald Campus of McGill University
 21,111 Lakeshore Road
 Sainte-Anne-de-Bellevue QC H9X 3V9
 Canada
 Telephone: 514-398-7838
 Email: gradstudies.macdonald@mcgill.ca
 Website: www.mcgill.ca/foodscience

12.5.2 About Food Science and Agricultural Chemistry

The Department of Food Science and Agricultural Chemistry offers M.Sc. (thesis and non-thesis) and Ph.D. programs. These programs provide training in evolving interdisciplinary areas of:

- food quality;
- food safety/food microbiology;
- food chemistry;
- food biotechnology;
- functional ingredients;
- applied infrared spectroscopy;
- food processing;
- thermal generation of aromas and toxicants;
- marine biochemistry;
- food chemical toxicants.

The Department has key infrastructure with all major equipment necessary for conducting research in all these areas. Our graduate program provides strong mentoring/advisory support while maintaining high flexibility for individual research projects.

section 12.5.6: Master of Science (M.Sc.) Food Science and Agricultural Chemistry (Non-Thesis) (45 credits)

The program offers advanced food science courses in a broad range of areas. It is suitable for students with an undergraduate degree in food science or a closely related discipline. Students must complete a total of 45 credits including ten graduate-level courses, the graduate seminar, and the research project.

section 12.5.6: Master of Science (M.Sc.) Food Science and Agricultural Chemistry (Non-Thesis) (45 credits)

The program may be completed in three to four academic terms (12 to 16 months). Entry is possible from other disciplines; however, students may be required to complete selected undergraduate courses as determined by the Department at the time of admission in order to orient themselves to food science. Subsequent career paths include work within the food industry and government agencies.

section 12.5.7: Master of Science (M.Sc.) Food Science & Agricultural Chemistry: Food Safety (Non-Thesis) (45 credits)

The Food Safety concentration is offered to candidates who seek further specialization in the area of food safety but do not wish to pursue independent research. It is intended to train graduate students as specialists in food safety with the expectation that graduates will be well-prepared academically to take on the challenging food safety ev

- Proof of funding (all graduate programs, international applicants only): Documents must be provided in the application to prove that funding is available for the entire duration of the applied-for degree (including tuition, fees, surcharges, books and supplies, living and personal expenses, and any mandatory medical insurance required for the applicant's studies).
- An interview with the applicant may be requested by the Department of Food Science and Agricultural Chemistry in order to assist in the evaluation of the application.

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 Food Science and Agricultural 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.

	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)
Fall Term:	Sept. 15	March 15	March 15	March 15
Winter Term*:	Feb. 15*	Aug. 31*	Aug. 31*	Aug. 31*
Summer Term:	N/A	N/A	N/A	N/A

* Admission to the Winter term is open for thesis programs only.

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

International applicants are advised to apply well in advance of these dates because immigration procedures may be lengthy.

12.5.4 Food Science and Agricultural Chemistry Faculty

Chair

Varoujan A. Yaylayan

Graduate Program Director

Ashraf Ismail

Emeritus Professors

Inteaz Alli; B.Sc.(Guyana), M.Sc., Ph.D.(McG.)

Frederik R. van de Voort; B.Sc., M.Sc., Ph.D.(Bcultural Chemi637 444B.Sc., M.Sc.Bcunl Coli637 44o48 592.147 lhf122.8227 293.121 Tmrg0.9804 0.9(ance of these e

Adjunct Professors

Luis Garcia; M.Sc.(Guelph)

Lawrence Goodridge; B.Sc., M.Sc., Ph.D.(Guelph)

Jocelyn Pare; B.Sc.(McG.), Ph.D.(Car.)

Ali Taherian; B.Sc.(SBU, Iran), M.Sc., Ph.D.(McG.)

Research/Academic Associates

Jacqueline Sedman; B.Sc., Ph.D.(McG.)

12.5.5 Master of Science (M.Sc.) Food Science and Agricultural Chemistry (Thesis) (45 credits)

For candidates entering the M.Sc. program without restrictions, i.e., those not requiring a qualifying term/year, the M.Sc. degree consists of 45 graduate credits. These credits are obtained through a combination of graduate courses and a research thesis.

The residence time for a M.Sc. degree is three academic terms based on unqualified entry into the M.Sc. program. Students are encouraged to complete their studies within this time frame.

Thesis (30 credits)

FDSC 690	(8)	M.Sc. Literature Review
FDSC 691	(7)	M.Sc. Research Protocol
FDSC 692	(15)	M.Sc. Thesis

Required Courses (6 credits)

FDSC 695	(3)	M.Sc. Graduate Seminar 1
FDSC 696	(3)	M.Sc. Graduate Seminar 2

Complementary Courses (9 credits)

At least 9 credits, normally from 500- or 600-level departmental courses.

12.5.6 Master of Science (M.Sc.) Food Science and Agricultural Chemistry (Non-Thesis) (45 credits)

This 45-credit program is offered to candidates who seek further training in Food Science, but do not wish to pursue independent research. These credits are obtained through a combination of graduate courses.

The residence time for a M.Sc. degree (Non-Thesis) is three academic terms.

PROGRAM REQUIREMENTS

Research Project (12 credits)

FDSC 697	(6)	M.Sc. Project Part 1
FDSC 698	(6)	M.Sc. Project Part 2

Complementary Courses (18 credits)

3 credits chosen from the following:

FDSC 695	(3)	M.Sc. Graduate Seminar 1
FDSC 696	(3)	M.Sc. Graduate Seminar 2

15 credits chosen from the following:

AGRI 510	(3)	Professional Practice
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FDSC 515	(3)	Enzymology
FDSC 516	(3)	Flavour Chemistry
FDSC 519	(3)	Advanced Food Processing
FDSC 520	(3)	Biophysical Chemistry of Food
FDSC 535	(3)	Food Biotechnology
FDSC 536	(3)	Food Traceability
FDSC 537	(3)	Nutraceutical Chemistry
FDSC 538	(3)	Food Science in Perspective
FDSC 540	(3)	Sensory Evaluation of Foods
FDSC 545	(3)	Advances in Food Microbiology
FDSC 634	(3)	Food Toxins & Toxicants
FDSC 651	(3)	Principles of Food Analysis 2
FDSC 652	(3)	Separation Techniques in Food Analysis 2

Elective Courses (15 credits)

At the 500 level or higher, and chosen in consultation with the academic adviser.

12.5.7 Master of Science (M.Sc.) Food Science & Agricultural Chemistry: Food Safety (Non-Thesis) (45 credits)

The program is intended to train graduate students as specialists in food safety with the expectation that graduates will be well prepared academically to take on the challenging food safety events and issues that emerge both in Canada and globally. The program will cover food safety through the entire food supply chain from food production through processing/manufacturing to the food consumer; the courses which make up the program reflect the food safety considerations at the different stages of the farm to table food supply chain.

Required Courses (12 credits)

FDSC 545	(3)	Advances in Food Microbiology
FDSC 624	(3)	Current Food Safety Issues
FDSC 626	(3)	Food Safety Risk Assessment
FDSC 634	(3)	Food Toxins & Toxicants

Research Project (12 credits)

FDSC 697	(6)	M.Sc. Project Part 1
FDSC 698	(6)	M.Sc. Project Part 2

Complementary Courses (15 credits)

3 credits chosen from the following:

FDSC 695	(3)	M.Sc. Graduate Seminar 1
FDSC 696	(3)	M.Sc. Graduate Seminar 2

12 credits chosen from the following:

AGRI 510	(3)	Professional Practice
BREE 535	(3)	Food Safety Engineering
FDSC 525	(3)	Food Quality Assurance
FDSC 536	(3)	Food Traceability

- nutritional management and development of novel nutritional approaches to optimize health during chronic diseases and for treatment during surgery and recovery from disease;

Research is conducted in our on-site research labs, the *Centre for Indigenous Peoples' Nutrition and Environment* (CINE), the *McGill Institute for Global Food Security*, the *Mary Emily Clinical Nutrition Research Unit* (MECNRU), and the MUHC Teaching Hospitals. Students can conduct research or participate in clinical rotations in Ghana and field sites in Asia, Africa, Latin America, and the Caribbean.

section 12.6.5: Master of Science (M.Sc.) Human Nutrition (Thesis) (45 credits)

A master's degree in Human Nutrition offers advanced Nutrition courses in a broad range of research areas. The program is suitable for students with an undergraduate degree in nutritional sciences, exercise physiology, kinesiology, food science, biochemistry, medicine, or another closely related field. Students are required to complete advanced nutrition coursework and activities related to their thesis research. Graduates of our M.Sc. thesis degree have pursued successful careers in research, international health agencies, government agencies, and industry.

section 12.6.7: Master of Science, Applied (M.Sc.A.) Human Nutrition (Non-Thesis): Practicum (45 credits) and section 12.6.8: Master of Science, Applied (M.Sc.A.) Human Nutrition (Non-Thesis): Project (45 credits)

The M.Sc. Applied program is a course-based master's program. It allows students to further develop knowledge and expertise in nutrition. Students are required to complete advanced Nutrition courses and activities related to a research project or an advanced practicum (reserved for registered dietitians). Careers include managerial positions for practising dietitians, and careers in nutrition programs, government, and industry.

section 12.6.6: Master of Science, Applied (M.Sc.A.) Human Nutrition (Non-Thesis): Dietetics Credentialing (83 credits)

The M.Sc. Applied program in Dietetics Credentialing is a course-based master's program with a dietetics *Stage* (internship) included. At the end of the program, students are qualified to be licensed with one of the provincial regulatory bodies in Canada, as well as in other countries, and practise in the areas of clinical nutrition, community nutrition, and foodservice management; French competency is an asset. The program is preceded by a Qualifying year, if necessary, to complete certain courses required for licensure. This is followed by three semesters of graduate-level courses and three semesters of *Stage*, which include a practice-based graduate project.

section 12.6.9: Doctor of Philosophy (Ph.D.) Human Nutrition

A Ph.D. degree in Human Nutrition is suitable for students with an M.Sc. degree in Nutritional Sciences or related areas who wish to become independent researchers and/or leaders in the field of nutritional sciences. The School offers a stimulating research environment with opportunities in a wide range of areas of basic science, clinical research with our many hospital clinicians, as well as population health in Canada and abroad. Careers include academic, senior government, and industry positions within Canada and internationally.

section 12.6.10: Graduate Diploma (Gr. Dip.) Registered Dietitian Credentialing (30 credits)

In the School of Human Nutrition at McGill, students pursuing a Ph.D. in human nutrition have the opportunity to apply to our Graduate Diploma in R.D. Credentialing, upon completion of the Ph.D. program and upon completion of the undergraduate courses required by *l'Ordre professionnel des diététistes du Québec* (OPDQ). Additional preparatory courses for *Stages* (internships) are NUTR 513, NUTR 515, NUTR 607, and NUTR 611. This Diploma consists of two semesters of *Stage* (internship) in Clinical Nutrition, Community Nutrition, and Foodservice Management. Upon completion of the Diploma, the recipient is eligible to re

equivalency of 3.2/4.0 (second class–upper division) during their bachelor's and master's degree programs. Exceptional students may apply to transfer to the Ph.D. program after one year of study in the M.Sc. (Thesis) program.

Qualifying Students

Some applicants whose academic degrees and standing entitle them to serious consideration for admission to graduate studies, but who are considered inadequately prepared in the subject selected may be admitted to a Qualifying program if they have met the School's minimum CGPA of 3.2 out of 4.0. The courses to be taken in a Qualifying program will be prescribed by the academic unit. Qualifying students are registered in graduate studies, **but not as candidates for a degree**. Only one Qualifying year (two terms) is permitted. **Successful completion of a Qualifying program does not guarantee admission to a degree program. Students must re-apply for admission to a degree program.**

Financial Aid

Financial aid is available but limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application. Normally, a student will not be accepted unless adequate financial support can be provided through a scholarship/award and/or by the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships.

12.6.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

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

12.6.3.2.1 Additional Requirements

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

- Final acceptance to the M.Sc. (Thesis) and Ph.D. programs depends on a faculty member agreeing to serve as the student's supervisor. A supervisor is not required for acceptance to the M.Sc. (Applied) program.
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Professors

Hope Weiler; B.A.Sc.(Guelph), Ph.D.(McM.), R.D.(CDO) (*on leave*)

Linda J. Wykes; B.Sc., M.Sc., Ph.D.(Tor.)

Associate Professors

Niladri Basu; B.Sc.(Qu.), M.Sc.(Br. Col.), Ph.D.(McG.) (*Canada Research Chair*) (*joint appt. with Natural Resource Sciences*) (*Assoc. Member of Epidemiology and Biostatistics, Faculty of Medicine*)

Stéphanie Chevalier; B.Sc., M.Sc., Ph.D.(Montr.), Dt. P.(OPDQ) (*Assoc. Member Dept of Medicine*) (*Graduate Program Director*)

Treena Delormier; B.Sc., M.Sc.(McG.), Ph.D.(Montr.), P. Dt.(OPDQ) (*Associate Director of the Centre for Indigenous Peoples' Nutrition and Environment*)

Kristine G. Koski; B.S., M.S.(Wash.), Ph.D.(Calif.), R.D.(U.S.)

Stan Kubow; B.Sc.(McG.), M.Sc.(Tor.), Ph.D.(Guelph)

Grace S. Marquis; B.A.(Ind.), M.Sc.(Mich. St.), Ph.D.(Cornell)

Hugo Melgar-Quinonez; M.Sc.(SPHM), M.D.(USAC), D.Sc.(Friedrich Schiller) (*Academic Scholar, Margaret A. Gilliam Institute for Global Food Security*)

Assistant Professors

Anne-Sophie Brazeau; B.Sc., Ph.D.(Montr.), P. Dt.(OPDQ) (*Director, Dietetics Education and Practice*)

Ryan Mailloux; B.Sc., Ph.D.(Laur.)

Daiva Nielsen; B.Sc., Ph.D.(Tor.)

Academic Associate

Patrick Cortbaoui; Ph.D.(McG.), Ag.Eng. (*Managing Director, Margaret A. Gilliam Institute for Global Food Security*)

Senior Faculty Lecturers

Sandy Phillips; B.Sc., M.Sc.(A.)(McG.), Dt. P. (*University Coordinator, Professional Practice (Stage) in Dietetics*)

Hugues Plourde; B.Sc.(McG.), M.Sc., Ph.D.(Montr.), Dt. P.

Maureen Rose; B.Sc., M.Ed., Ph.D.(McG.), Dt. P. (*Director, Food and Nutrition LaLrition LaLrite.4on LaLrition LaLrite.4on LaLsors*)

Adjunct Professor

Kevin A. Cockell; B.Sc., Ph.D.(Guelph) (*Health Canada*)

Isabelle Germain; B.Sc.(Montr.), M.Sc., Ph.D.(McG.) (*Agriculture and Agri-Food Canada*)

Elizabeth D. Mansfield; B.Sc.(C'odia), B.Sc., M.Sc., Ph.D.(McG.),

Affiliate Members

Marie-Ève Besner; B.Sc.(Laval), PDt (*Montreal Childr*

PSYC 650 (3) Advanced Statistics 1

Elective Courses (3 credits)

To be chosen, at the 500 level or higher, in consultation with the Program Coordinator.

12.6.7 Master of Science, Applied (M.Sc.A.) Human Nutrition (Non-Thesis): Practicum (45 credits)

Practicum (12 credits)

NUTR 656 (3) M.Sc. (Applied) Practicum 1
NUTR 657 (3) M.Sc. (Applied) Practicum 2
NUTR 658 (3) M.Sc. (Applied) Practicum 3
NUTR 659 (3) M.Sc. (Applied) Practicum 4

Required Courses (6 credits)

NUTR 651 (3) M.Sc. (Applied) Literature Review
NUTR 660 (1) M.Sc.(Applied) Final Presentation
NUTR 695 (1) Human Nutrition Research Orientation
NUTR 696 (1) Human Nutrition Seminar

Complementary Courses (18 credits)

3 credits in statistics at the 500 level or higher

3 credits in research methods at the 500 level or higher

12 credits of course work, at the 500 level or higher, in Nutrition, Animal Science, or Food Science chosen in consultation with the student's supervisor.

Elective Courses (9 credits)

9 credits of 500-level or higher courses in consultation with the student's academic adviser or supervisor.

12.6.8 Master of Science, Applied (M.Sc.A.) Human Nutrition (Non-Thesis): Project (45 credits)

Research Project (12 credits)

NUTR 652 (3) M.Sc. (Applied) Project 1
NUTR 653 (3) M.Sc. (Applied) Project 2
NUTR 654 (3) M.Sc. (Applied) Project 3
NUTR 655 (3) M.Sc. (Applied) Project 4

Required Courses (6 credits)

NUTR 651 (3) M.Sc. (Applied) Literature Review
NUTR 660 (1) M.Sc.(Applied) Final Presentation
Human Nutrition Research Orientation

3 credits in research methods at the 500 level or higher

12 credits of course work, at the 500 level or higher, in Nutrition, Animal Science, or Food Science chosen in consultation with the student's supervisor.

Elective Courses (9 credits)

9 credits of 500-level or higher courses in consultation with the student's academic adviser or supervisor.

12.6.9 Doctor of Philosophy (Ph.D.) Human Nutrition

Thesis

12.7.2 About Natural Resource Sciences

The Department of Natural Resource Sciences offers programs leading to **M.Sc.** and **Ph.D.** degrees in:

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section 12.7.11: Master of Science (M.Sc.) Renewable Resources (Thesis): Environment (46 credits)

Please contact the Department for more information about this program.

section 12.7.12: Master of Science (M.Sc.) Renewable Resources (Thesis): Neotropical Environment (48 credits)

Please contact the Department for more information about this program.

section 12.7.13: Master of Science (M.Sc.) Renewable Resources (Non-Thesis): Environmental Assessment (45 credits)

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

Ph.D. Degrees in Entomology, Microbiology, or Renewable Resources (Includes Micrometeorology, Forest Science, Soil Science, and Wildlife Biology)***section 12.7.14: Doctor of Philosophy (Ph.D.) Entomology***

Graduate students in the entomology program work within, and often across, multiple disciplines of basic and applied environmental sciences. Specialties within the program include terrestrial arthropod ecology, physiology, zoogeography, diversity, and systematics. Our students typically have exceptionally strong backgrounds in one or more of these specialties and an interest in research that advances both theory and applied management of ecosystems. After completing their degrees they go on to careers in academia, environmental policy, government agencies, industry, and other fields.

section 12.7.15: Doctor of Philosophy (Ph.D.) Entomology: Environment

Please contact the Department for more information about this program.

section 12.7.16: Doctor of Philosophy (Ph.D.) Entomology: Neotropical Environment

Please contact the Department for more information about this program.

section 12.7.17: Doctor of Philosophy (Ph.D.) Microbiology

Graduate students in the microbiology program work within, and often across, multiple disciplines of basic and applied environmental sciences. Specialties within the program range from the study of microbial diversity in extreme environments, either natural or man-induced, to the role of microbes in managed ecosystems, such as in agriculture and forests. Our students typically have exceptionally strong backgrounds in one or more of these specialties and an interest in research that advances our fundamental knowledge about microorganisms and leads to improved efficiencies of our managed ecosystems. After completing their degrees they go on to careers in academia, environmental policy, government agencies, industry, and other fields.

section 12.7.18: Doctor of Philosophy (Ph.D.) Microbiology: Bioinformatics

Please contact the Department for more information about this program.

: Doctor of Philosophy (Ph.D.) Microbiology: Environment

Please contact the Department for more information about this program.

section 12.7.19: Doctor of Philosophy (Ph.D.) Renewable Resources

Graduate students in the renewable resources program work within, and often across, multiple disciplines of basic and applied environmental sciences. Specialties within the program include environmental and ecological economics, environmental health and toxicology, forest ecology and fisheries biology, landscape ecology, limnology, micrometeorology, soil science, and wildlife biology. Our students typically have exceptionally strong backgrounds in one or more of these specialties and an interest in research that advances both theory and applied management of natural resources. After completing their degrees they go on to careers in academia, environmental policy, government agencies, industry, and other fields.

section 12.7.20: Doctor of Philosophy (Ph.D.) Renewable Resources: Environment

Please contact the Department for more information about this program.

section 12.7.21: Doctor of Philosophy (Ph.D.) Renewable Resources: Neotropical Environment

Please contact the Department for more information about this program.

12.7.3 Natural Resource Science Admission Requirements and Application Procedures

12.7.3.1 Admission Requirements

M.Sc. Thesis (Agricultural Economics)

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

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

M.Sc. Thesis (Entomology, Microbiology, Renewable Resources)

Candidates are required to have a bachelor's degree with a minimum equivalent CGPA of 3.0/4.0 (second class–upper division) or a minimum GPA of 3.2/4.0 during the last two years of full-time university study. High grades are expected in courses considered by the academic unit to be preparatory to the graduate program.

M.Sc. in Renewable Resources (Non-Thesis) – Environmental Assessment Option

Applications are not being accepted for the current academic year; the program is currently under review.

Ph.D. Thesis (Entomology, Microbiology, Renewable Resources)

Candidates are normally required to hold an M.Sc. degree and will be judged primarily on their ability to conduct an original and independent research study.

Qualifying Program

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

Financial Aid

Financial aid is available but limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application. Normally, a student will not be accepted unless adequate financial support can be provided through a scholarship/award and/or by the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships.

12.7.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

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

12.7.3.2.1 Additional Requirements

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

-

12.7.4 Natural Resource Sciences Faculty

Chair

Brian Driscoll

Graduate Program Director

Sébastien Faucher

Program Director - Agricultural Economics

Paul J. Thomassin

Emeritus Professors

David M. Bird; B.Sc.(Guelph), M.Sc., Ph.D.(McG.) – *Wildlife Biology*

William H. Hendershot; B.Sc.(Tor.), M.Sc.(McG.), Ph.D.(Br. Col.) – *Soil Science*

Edmund S. Idziak; B.Sc.(Agr.), M.Sc.(McG.), D.Sc.(TU Delft) – *Microbiology*

Angus F. MacKenzie; B.S.A., M.Sc.(Sask.), Ph.D.(Cornell) – *Soil Science*

Peter H. Schuepp; Dipl.Sc.Nat.(Zürich), Ph.D.(Tor.) – *Agricultural Physics*

Robin K. Stewart; B.Sc.(Agr.), Ph.D.(Glas.) – *Entomology*

Professors

Elena Bennett; B.A.(Oberlin), M.S., Ph.D.(Wisc.) (*joint appt. with McGill School of Environment*) – *Ecosystem Ecology*

Peter Brown; B.A.(Haver.), M.A., Ph.D.(Col.) (*joint appt. with Geo*)

Assistant Professors

Denis Roy; B.Sc.(Qu.), M.Sc., Ph.D.(Windsor)

Associate Member

Christopher Barrington (*School of Environment*)

David Green (*Redpath Museum*)

Adjunct Professors

Kimberly Fernie

Charles W. Greer

Baoluo Ma

Affiliate Member

Geoffrey Sunahara

A minimum of 3 credits from the following:

AGEC 630	(3)	Food and Agricultural Policy
AGEC 633	(3)	Environmental and Natural Resource Economics
AGEC 642	(3)	Economics of Agricultural Development
AGEC 685	(3)	Selected Topics in Agricultural Economics

Additional Complementary Courses: To complete the 45 credit program requirement from courses in your field or thesis area at the 500 level or higher in consultation with the Agricultural Economics Adviser.

12.7.6 Master of Science (M.Sc.) Entomology (Thesis) (45 credits)

Thesis Courses (36 credits)

NRSC 691	(12)	M.Sc. Thesis Research 1
NRSC 692	(12)	M.Sc. Thesis Research 2
NRSC 693	(12)	M.Sc. Thesis Research 3

Required Courses (3 credits)

NRSC 643	(1)	Graduate Seminar 1
NRSC 644	(1)	Graduate Seminar 2
NRSC 651	(1)	Graduate Seminar 3

Complementary Courses (6 credits)

Two 3-credit courses at the 500, 600, or 700 level; normally one of these will be a course in statistics.

12.7.7 Master of Science (M.Sc.) Entomology (Thesis): Environment (46 credits)

Thesis Courses (36 credits)

NRSC 691	(12)	M.Sc. Thesis Research 1
NRSC 692	(12)	M.Sc. Thesis Research 2
NRSC 693	(12)	M.Sc. Thesis Research 3

Required Courses (7 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
NRSC 651	(1)	Graduate Seminar 3

Complementary Courses (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 500-, 600-, or 700-level course recommended by the Advisory Committee and approved by the Environment Option Committee.

12.7.8 Master of Science (M.Sc.) Entomology (Thesis): Neotropical Environment (48 credits)

Thesis Courses (36 credits)

NRSC 691	(12)	M.Sc. Thesis Research 1
NRSC 692	(12)	M.Sc. Thesis Research 2
NRSC 693	(12)	M.Sc. Thesis Research 3

Required Courses (9 credits)

BIOL 640	(3)	Tropical Biology and Conservation
ENVR 610	(3)	Foundations of Environmental Policy
52 506.reof En	(1)	Graduate Seminar 1

NRSC 692	(12)	M.Sc. Thesis Research 2
NRSC 693	(12)	M.Sc. Thesis Research 3

Required Courses (3 credits)

NRSC 643	(1)	Graduate Seminar 1
NRSC 644	(1)	Graduate Seminar 2
NRSC 651	(1)	Graduate Seminar 3

Complementary Courses (6 credits)

Two 3-credit courses at the 500 level or higher recommended by the supervisory committee; one of which must be in quantitative methods/techniques.

12.7.11 Master of Science (M.Sc.) Renewable Resources (Thesis): Environment (46 credits)

Thesis Courses (33 credits)

NRSC 691	(12)	M.Sc. Thesis Research 1
NRSC 692	(12)	M.Sc. Thesis Research 2
NRSC 694	(9)	M.Sc. Thesis Research 4

Required Courses (7 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
NRSC 651	(1)	Graduate Seminar 3

Complementary Courses (6 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 500-, 600-, or 700-level course recommended by the Advisory Committee and approved by the Environment Option Committee.

3 credits of statistics at the 500, 600, or 700 level.

NRSC 693 (12) M.Sc. Thesis Research 3

Required Courses (9 credits)

BIOL 640 (3) Tropical Biology and Conservation
ENVR 610 (3) Foundations of Environmental Policy
NRSC 643 (1) Graduate Seminar 1
NRSC 644 (1) Graduate Seminar 2
NRSC 651 (1) Graduate Seminar 3

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

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.

12.7.13 Master of Science (M.Sc.) Renewable Resources (Non-Thesis): Environmental Assessment (45 credits)

This program is currently not offered.

The non-thesis master's in Renewable Resources: Environmental Assessment option is normally taken over a one year cycle beginning in the Winter term and concluding in the Fall term. It is comprised of three interrelated elements: graduate-level courses, primarily given in the Winter term, a Summer term internship, and a project-related research paper, which is completed in the Fall term. The program is aimed at environmental assessment professionals and advanced environmental science scholars planning for careers in the public and private sector agencies, which guide environmental impact assessment, integrated assessment, and sustainable development in Canada and internationally. McGill's non-thesis master's in Environmental Assessment is offered in conjunction with a Memorandum of Understanding (MOU) with the United Nations Environment Program (UNEP - 2003), which designates the Faculty of Agricultural and Environmental Sciences as a UNEP Collaborating Centre on Environmental Assessment. An important component of the MOU is that the Faculty advance teaching and training through the development of course offerings that enable students to prepare for contributing to sustainable development by utilizing the excellent materials provided by UNEP and other national and international agencies.

Research Project (9 credits)

NRSC 616 (9) Environmental Assessment Project Paper

Required Internship (15 credits)

NRSC 615 (15) Environmental Assessment Internship

Required Courses (15 credits)

NRSC 610 (3) Advanced Environmental Assessment
NRSC 611 (3) Environmental Assessment Knowledge Base
NRSC 612 (3) Environmental Assessment and Sustainable Development
Strate

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

NRSC 701	(0)	Ph.D. Comprehensive Examination
NRSC 751	(0)	Graduate Seminar 4
NRSC 752	(0)	Graduate Seminar 5
NRSC 753	(0)	Graduate Seminar 6
NRSC 754	(0)	Graduate Seminar 7

Coursework

Course requirements are specified by the staff in the discipline, but are flexible and depend largely on the student's background, immediate interests, and ultimate objectives.

12.7.15 Doctor of Philosophy (Ph.D.) Entomology: Environment

The Ph.D. in Entomology Environment is a research program offered in collaboration with the McGill School of Environment. As a complement to the unit's expertise, the program considers how various dimensions (scientific, social, leg

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
NRSC 701	(0)	Ph.D. Comprehensive Examination
NRSC 751	(0)	Graduate Seminar 4
NRSC 752	(0)	Graduate Seminar 5
NRSC 753	(0)	Graduate Seminar 6
NRSC 754	(0)	Graduate Seminar 7

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

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.

12.7.17 Doctor of Philosophy (Ph.D.) Microbiology

Includes Micrometeorology, Forest Science, Soil Science, and Wildlife 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

NRSC 701	(0)	Ph.D. Comprehensive Examination
NRSC 751	(0)	Graduate Seminar 4
NRSC 752	(0)	Graduate Seminar 5
NRSC 753	(0)	Graduate Seminar 6
NRSC 754	(0)	Graduate Seminar 7

Coursework

Course requirements are specified by the staff in the discipline, but are flexible and depend largely on the student's background, immediate interests, and ultimate objectives.

12.7.18 Doctor of Philosophy (Ph.D.) Microbiology: Bioinformatics

Thesis

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

Required Courses

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

NRSC 701	(0)	Ph.D. Comprehensive Examination
NRSC 751	(0)	Graduate Seminar 4
NRSC 752	(0)	Graduate Seminar 5
NRSC 753	(0)	Graduate Seminar 6
NRSC 754	(0)	Graduate Seminar 7

Complementary Courses

6 credits 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

Additional courses at the 500, 600, or 700 level may be required at the discretion of the candidate's supervisory committee.

12.7.19 Doctor of Philosophy (Ph.D.) Renewable Resources

Includes Micrometeorology, Forest Science, Soil Science, and Wildlife 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

NRSC 701	(0)	Ph.D. Comprehensive Examination
NRSC 751	(0)	Graduate Seminar 4
NRSC 752	(0)	Graduate Seminar 5
NRSC 753	(0)	Graduate Seminar 6
NRSC 754	(0)	Graduate Seminar 7

Coursework

Course requirements are specified by the staff in the discipline, but are flexible and depend largely on the student's background, immediate interests, and ultimate objectives.

12.7.20 Doctor of Philosophy (Ph.D.) Renewable Resources: Environment

The Ph.D. in Renewable Resources Environment is a research program offered in collaboration with the McGill 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 expression and for publication in the public domain.

Required Courses (3 credits)

21,111 Lakeshore Road
Sainte-Anne-de-Bellevue QC H9X 3V9
Canada
Telephone: 514-398-7838
Email: gradstudies.macdonald@mcgill.ca
Website: www.mcgill.ca/parasitology

12.8.2 About Parasitology

The Institute of Parasitology offers **M.Sc.** and **Ph.D.** thesis research degrees in Parasitology and a non-thesis **M.Sc. (Applied)** degree in Biotechnology (Information on the Biotechnology programs is found in the [section 12.4: Biotechnology](#) section). For the Ph.D. program, it is possible to add a Bioinformatics or Environment option.

The Institute of Parasitology teaches and researches the phenomenon of parasitism in humans, livestock, and other animals, and the control of parasitic diseases. The interface of parasitism/immunity/nutrition is also examined in the context of the host-parasite interaction. Current research involves:

- molecular biology;
- molecular genetics;
- biochemistry;
- bioinformatics;
- pharmacology;
- control and drug resistance;
- immunology;
- epidemiology;
- biology;
- neurobiology;
- drug discovery;
- the ecology of parasitic organisms, such as helminths and protozoa, viruses, and cancer cells.

The non-thesis program in Biotechnology offers course-based curricula with practical training in laboratory courses and internships.

The Institute is housed in its own building adjacent to the Macdonald Campus Library and has well-equipped modern laboratories with excellent facilities for molecular research, and includes a confocal suite. Small and large animal facilities are available on the Macdonald campus. The Institute is affiliated with the [J.D. MacLean Centre for Tropical Diseases](#) at the McGill University Health Centre (MUHC).

Graduates typically go on to academic and research careers; enter private industry in the biotechnology and pharmaceutical sectors in research, management, technical services, and sales; or accept positions in the health, agriculture, food safety, and other government sectors.

Parasitology Programs

[section 12.8.5: Master of Science \(M.Sc.\) Parasitology \(Thesis\) \(45 credits\)](#)

A research project is undertaken in an area of parasitology under the direction of a supervisor, and a thesis is produced. Coursework is minimal. Graduates have gone on to medical school, to teaching positions, or have found employment in scientific fields.

[section 12.8.6: Doctor of Philosophy \(Ph.D.\) Parasitology](#)

An advanced, original research project is undertaken in an area of parasitology supervised by faculty staff. Coursework is minimal. Graduates are well suited for teaching positions in academia or scientific careers in a university, private industry, or government.

[section 12.8.7: Doctor of Philosophy \(Ph.D.\) Parasitology: Bioinformatics](#)

An advanced, original research project in an area of parasitology is undertaken supervised by faculty staff, and a thesis is produced. Additional coursework in the field of bioinformatics is required for this option. Graduates are well suited for a teaching or research career, especially where there is particular emphasis on the science of bioinformatics.

12.8.3 Parasitology Admission Requirements and Application Procedures

12.8.3.1 Admission Requirements

Candidates for either the M.Sc. or the Ph.D. thesis research degree should possess a bachelor's degree in the biological or medical sciences with a minimum cumulative grade point average (CGPA) of 3.2/4.0 (second class–upper division). High grades are expected in courses considered by the academic unit to be preparatory to the graduate program. Previous experience in parasitology is not essential.

Qualifying Students

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

Financial Support

Financial aid is available but limited and highly competitive. It is suggested that students give serious consideration to their financial planning before submitting an application. Normally, a student will not be accepted unless adequate financial support can be provided through a scholarship/award and/or by the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships. For information on awards and funding opportunities, see:

- www.mcgill.ca/gradapplicants/funding;
- www.mcgill.ca/parasitology/graduatestudies/admissions;
- www.mcgill.ca/macdonald/prospective/gradstudies/funding;
- www.mcgill.ca/macdonald/gradstudents/gradawards; and
- www.mcgill.ca/internalawards/faculty/agricultural-and-environmental-sciences.

12.8.3.2 Application Procedures

McGill's online application form for graduate program candidates is available at www.mcgill.ca/gradapplicants/apply.

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

12.8.3.2.1 Additional Requirements

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

- Acceptance to all thesis research programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support.
- International students are strongly encouraged to secure funding from their home country or international agencies.
- Other documents may be required for the admission process. Please consult the Parasitology website at www.mcgill.ca/parasitology/graduatestudies/admission for full details.

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 Institute of Parasitology 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.

12.8.4 Parasitology Faculty

Director

Armando Jardim

Emeritus Professors

Timothy G. Geary; B.Sc.(Notre Dame), Ph.D.(Mich.)

Professors

Roger Prichard; B.Sc., Ph.D.(UNSW) (*James McGill Professor*)

Marilyn Scott; B.Sc.(New Br.), Ph.D.(McG.)

Associate Professors

Robin N. Beech; B.Sc.(Nott.), Ph.D.(Edin.)

Elias Georges; B.Sc., Ph.D.(McG.) (*Canadian Pacific Chair in Biotechnology*)

Armando Jardim; B.Sc., Ph.D.(Vic., BC)

Petra Rohrbach; B.Sc.(McG.), Ph.D.(Heidel.)

Reza Salavati; B.Sc. M.Sc.(Calif. St.), Ph.D.(Wesl.)

Assistant Professors

Igor Cestari; B.Sc.(UFPE, Brazil), M.Sc., Ph.D.(FIOCRUZ, Brazil)

Thavy Long; B.Sc., M.Sc., Ph.D.(ULille)

Fernando Lopes; B.Sc.(UniBH, Brazil), M.Sc., Ph.D.(UFMG.t Pr

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.

12.9 Plant Science

12.9.1 Location

Department of Plant Science
 Macdonald Campus
 21,111 Lakeshore Road
 Sainte-Anne-de-Bellevue QC H9X 3V9
 Canada
 Telephone: 514-398-7838
 Email: gradstudies.macdonald@mcgill.ca
 Website: www.mcgill.ca/plant

12.9.2 About Plant Science

The Department offers an M.Sc. and a Ph.D. in Plant Science with options in Bioinformatics, Environment, or Neotropical Environment, and provides for study in all fields of plant science. Research facilities—both field and laboratory—are available for investigations in plant breeding, crop physiology, crop management, crop quality, plant ecology, the epidemiology and biology of plant diseases, epigenetics, biosystematics, recombinant DNA technology, mycology, weed biology, tissue culture, plant biochemistry, and bioinformatics. Facilities include:

- Horticultural Research Centre
- Emile A. Lods Agronomy Research Centre
- greenhouses
- growth cabinets
- McGill University Herbarium
- multi-scale imaging facility
- genome editing laboratory
- plant-pest containment laboratory
- field phenomics platform

An advisory committee is named for each student and has the responsibility of developing the program of study appropriate to the student's background and area of specialization.

section 12.9.5: Master of Science (M.Sc.) Plant Science (Thesis) (45 credits)

This M.Sc. in Plant Science requires approximately two years for completion. Overall, the program consists of two graduate-level courses, seminars, and a research project leading to a thesis. The courses and the research project are chosen and defined with the help of an advisory committee. Subsequent career paths are varied, but include work with government agencies, the private sector, or further graduate studies in a related field.

section 12.9.6: Master of Science (M.Sc.) Plant Science (Thesis): Bioinformatics (48 credits)

This M.Sc. in Plant Science requires approximately two years for completion. Overall, the program consists of two graduate-level courses, seminars, and a research project leading to a thesis. The courses and the research project are chosen and defined with the help of an advisory committee. The goal of the Bioinformatics option is to train students to become researchers in the interdisciplinary field of bioinformatics, which lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. This option has an added emphasis on bioinformatics, including additional seminars. Subsequent career paths are varied, but include work with government agencies, the private sector, or further graduate studies in a related field.

: Master of Science (M.Sc.) Plant Science (Thesis): Environment (48 credits)

This M.Sc. in Plant Science requires approximately two years for completion. Overall, the program consists of two graduate-level courses, seminars, and a research project leading to a thesis. The courses and the research project are chosen and defined with the help of an advisory committee. Subsequent career paths are varied, but include work with government agencies, the private sector, or further graduate studies in a related field. This Environment graduate option has an added emphasis on environmental sciences, including additional courses and seminars. It is aimed at students who wish to take an interdisciplinary approach in their graduate research on environmental issues and who wish to benefit from interactions with students from a wide range of disciplines.

Qualifying Students

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

Financial Aid

Financial aid is available but limited and highly competitiv

Professors

Philippe Seguin; B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(Minn.)

Donald L. Smith; B.Sc., M.Sc.(Acad.), Ph.D.(Guelph) (*Distinguished James McGill Professor*)

Associate Professors

Jacqueline C. Bede; B.Sc.(Calg.), M.Sc., Ph.D.(Tor.)

Sylvie de Blois; B.Sc.(Agr.)(McG.), M.Sc., Ph.D.(Montr.)

Jean-Benoit Charron; B.Sc.(Montr.), M.Sc., Ph.D.(UQAM)

Valérie Gravel; B.Sc.(Agr.), M.Sc., Ph.D.(Laval)

Jaswinder Singh; B.Sc.(Agr.), M.Sc.(PAU), Ph.D.(Syd.)

Martina V. Stromvik; B.A., M.Sc.(Stockholm), Ph.D.(Ill.)

Assistant Professors

Valerio Hoyos-Villegas; B.Sc.(Caldas), M.Sc.(Missouri/Col.), Ph.D.(Mich.)

Faculty Lecturers

Caroline Begg; B.Sc.(Agr.)(McG.), M.Sc.(Sask.), Ph.D.(McG.)

David Wees; B.Sc.(Agr.), M.Sc.(McG.)

Adjunct Professors

Konstantinos Aliferis

Annick Bertrand

Olivia Wilkins; B.Sc.(Manit.), Ph.D.(Tor.)

12.9.5 Master of Science (M.Sc.) Plant Science (Thesis) (45 credits)

Thesis Courses (39 credits)

PLNT 664	(12)	M.Sc. Thesis 1
PLNT 665	(12)	M.Sc. Thesis 2
PLNT 666	(15)	M.Sc. Thesis 3

Required Invitational Seminar

PLNT 690	(0)	Research Horizons in Plant Science 1
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Complementary Courses (6 credits)

Two graduate-level courses

Additional courses may be required at the discretion of the candidate's supervisory committee.

12.9.6 Master of Science (M.Sc.) Plant Science (Thesis): Bioinformatics (48 credits)

Thesis Courses (39 credits)

PLNT 664	(12)	M.Sc. Thesis 1
PLNT 665	(12)	M.Sc. Thesis 2
PLNT 666	(15)	M.Sc. Thesis 3

Required Invitational Seminar

PLNT 690 (0) Research Horizons in Plant Science 1

Required Courses (3 credits)

COMP 616D1 (1.5) Bioinformatics Seminar

COMP 616D2 (1.5) Bioinformatics Seminar

PLNT 691 (0) Research Horizons in Plant Science 2

Complementary Courses (6 credits)

Chosen from the following:

BINF 511 (3) Bioinformatics for Genomics

12.9.8 Master of Science, Applied (M.Sc.A.) Plant Science (Non-Thesis) (45 credits)

N.B. this program is under revision. Please contact Ms. Carolyn Bowes for information.

12.9.9 Doctor of Philosophy (Ph.D.) Plant Science

Students who have taken their M.Sc. degree at McGill University will be required to spend one term in study at another research institution.

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 Invitational Seminar

PLNT 690	(0)	Research Horizons in Plant Science 1
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Required Courses

* Must be taken within one year of registering

PLNT 701	(0)	Doctoral Comprehensive Examination
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Complementary Courses

Any courses at the 500 or 600 level deemed necessary for the chosen area of specialization.

12.9.10 Doctor of Philosophy (Ph.D.) Plant Science: Bioinformatics

Thesis

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

Required Invitational Seminar

PLNT 690	(0)	Research Horizons in Plant Science 1
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Required Courses (3 credits)

* Must be taken within one year of registering.

COMP 616D1	(1.5)	Bioinformatics Seminar
COMP 616D2	(1.5)	Bioinformatics Seminar
PLNT 701*	(0)	Doctoral Comprehensive Examination

Complementary Courses (6 credits)

Two courses to be chosen from the following:

BINF 511	(3)	Bioinformatics for Genomics
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 or 600 level may be required at the discretion of the candidate's advisory committee.

12.9.11 Doctor of Philosophy (Ph.D.) Plant Science: Environment

The Ph.D. in Plant Science Environment is a research program offered in collaboration with the McGill 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.

Students who have taken their M.Sc. degree at McGill University will be required to spend one term in study at another research institution.

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 Invitational Seminar

PLNT 690	(0)	Research Horizons in Plant Science 1
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Required Courses (3 credits)

* Must be taken within the first year of registering

ENVR 615	(3)	Interdisciplinary Approach Environment and Sustainability
PLNT 701*	(0)	Doctoral Comprehensive Examination

Complementary Courses (6 credits)

3-6 credits from:

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

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.

12.9.12 Doctor of Philosophy (Ph.D.) Plant Science: Neotropical Environment

Students who have taken their M.Sc. degree at McGill University will be required to spend one term in study at another research institution.

The required thesis for this Ph.D. degree must display original scholarship expressed in proper literate style and must be a distinct contribution to knowledge.

Candidates must participate in the STRI seminar series when in residence in Panama, and in the MSE-Panama Symposium Presentation in Montreal.

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 Invitational Seminar

PLNT 690 (0) Research Horizons in Plant Science 1

Required Courses (6 credits)

* Must be taken within one year of registering.

BIOL 640 (3) Tropical Biology and Conservation
ENVR 610 (3) Foundations of Environmental Policy
PLNT 701* (0) Doctoral Comprehensive Examination

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.

12.9.13 Graduate Certificate (Gr. Cert.) Bioinformatics (15 credits)**Required Courses (9 credits)**

BINF 511 (3) Bioinformatics for Genomics
BINF 660 (3) Advances in Bioinformatics
BTEC 555 (3) Structural Bioinformatics

Complementary Courses (6 credits)

6 credits from the following:

ANSC 565 (3) Applied Information Systems
BMDE 652 (3) Bioinformatics: Proteomics
COMP 616D1 (1.5) Bioinformatics Seminar
COMP 616D2 (1.5) Bioinformatics Seminar
COMP 616N1 (1.5) Bioinformatics Seminar
COMP 616N2 (1.5) Bioinformatics Seminar
COMP 618 (3) Bioinformatics: Functional Genomics
GLIS 673 (3) Bioinformatics Resources
HGEN 663 (3) Beyond the Human Genome
