Faculty of Agricultural and Environmental Sciences, including School of Human Nutrition (Graduate)

Programs, Courses and University Regulations

2019-2020

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

1 . McGill University reserves the right to mak

Publication Information

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McGill University reserves the right to make changes to the information contained in this publication - including correcting errors, altering fees, schedules of admission and credit requirements, and revising or cancelling particular courses or programs - without prior notification.

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8.2 Guidelines and Policy for Academic Units on Postdoctoral Education

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

1. **Definition and Status**

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

5. Responsibilities

i. Postdocs are subject to the responsibilities outlined at *www.mcgill.ca/students/srr* 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 availability of research supervision facilities, office space, and research funding before recruiting Postdocs.

iv. Some examples of responsibilities of the department are:

- to verify the Postdoc's eligibility period for registration;
- to provide Postdocs with departmental policy and procedures that pertain to them;
- to oversee the registration and appointment of Postdocs;
- to assign departmental personnel (e.g., Postdoc coordinator and Graduate Program Director) the responsibility for Postdocs;
- to oversee and sign off on the Letter of Agreement for Postdoctoral Education;
- to ensure that each Postdoc has a supervisor, lab and/or office space, access to research operating costs and necessary equipment;
- to include Postdocs in departmental career and placement opportunities;
- to refer Postdocs to the appropriate University policies and personnel for the resolution of conflict that may arise between a Postdoc and a supervisor.

v. Some examples of responsibilities of the supervisor are:

- to uphold and transmit to their Postdocs the highest professional standards of research and/or scholarship;
- to provide research guidance;
- to meet regularly with their Postdocs;
- to provide feedback on research submitted by the Postdocs;
- to clarify expectations regarding intellectual property rights in accordance with the University's policy;
- to provide mentorship for career development;
- to prepare, sign, and adhere to a Letter of Agreement for Postdoctoral Education.

vi. Some examples of responsibilities of Postdocs are:

- to inform themselves of and adhere to the University's policies and/or regulations for Postdocs for leaves, for research, and for student conduct as outlined at *www.mcgill.ca/students/srr* and the Graduate and Postdoctoral Studies *University Regulations and Resources*;
- to submit a complete file for registration to Enrolment Services;
- to sign and adhere to their Letter of Agreement for Postdoctoral Education;
- to communicate regularly with their supervisor;
- to inform their supervisor of their absences.

vii. Some examples of the responsibilities of the University are:

- to register Postdocs;
- to provide an appeal mechanism in cases of conflict;
- to provide documented policies and procedures to Postdocs;
- to provide Postdocs with the necessary information on McGill University student services.

Approved by Senate, April 2000; revised May 2014

8.3 Vacation Policy for Graduate Students and Postdocs

Graduate students and Postdocs should normally be entitled to vacation leave equivalent to university holidays and an additional total of fifteen (15) working days in the year. Funded students and Postdocs with fellowships and research grant stipends taking additional vacation leave may have their funding reduced accordingly.

Council of FGSR April 23, 1999

8.4 Leave of Absence for Health and Parental/Familial Reasons

A leave of absence may be granted for maternity or parental reasons or for health reasons (see *University Regulations & Resources* > *Graduate* > *: Leave of Absence Status*).

Such a leave must be requested on a term-by-term basis and may be granted for a period of up to 52 weeks. For a maternity or parental leave, the eligibility period of a maximum of 52 consecutive weeks is determined based on when the child is born; if the leave is interrupted for one or two terms, the eligibility period cannot be extended. Students and Postdocs must make a request for such a leave in writing to their department and submit a medical certificate. The

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 Inic

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; priv

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)

For further information regarding the Master of Science, Applied (M.Sc.A.) Animal Science (Non-Thesis): Sustainable Agriculture, please click the above link.

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. At a minimum, it includes two seminar courses at the graduate level and the Ph.D. Comprehensive Examination as an admission to candidacy for the Ph.D. As with the M.Sc. (Thesis), admission is based on an excellent track record. Suitable candidates are encouraged to contact potential supervisors within their chosen area of interest. Applicants should, however, be aware that no professor is in a position to accept students without formal approval of the application by the Graduate Admissions Committee.

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

Bioinformatics research lies at the intersection of biological/medical sciences and mathematics/computer science/engineering. The intention of the Bioinformatics Option is to train students to become researchers in this interdisciplinary field. This includes the development of strategies for experimental design, the construction of tools to analyze datasets, the application of modelling techniques, the creation of tools for manipulating bioinformatics data, the integration of biological databases, and the use of algorithms and statistics.

Associate Professors

Kevin M. Wade; B.Sc.(Agr.), M.Sc.(Agr.)(Dublin), Ph.D.(Cornell)

David Zadworny; B.Sc., Ph.D.(Guelph)

Assistant Professors

Sergio Burgos; B.Sc.(Flor.), M.Sc.(Calif., Davis), Ph.D.(Guelph)

Jennifer Ronholm; B.Sc.(Wat.), Ph.D.(Ott.) (*joint appt. with Food Science and Agricultural Chemistry*)

Elsa Vasseur; B.Sc., M.Sc.(ISA, Lille), M.Sc.(AgroParisTech), Ph.D.(Laval) (*Industrial Research Chair in the Sustainable Life of Dairy Cattle*)

Jianguo (Jeff) Xia; B.M.(Peking Health Science), M.Sc., Ph.D.(Alta.) (*joint appt. with Parasitology*) (*Canada Research Chair in Bioinformatics and Big Data Analytics*)

Adjunct Professors

Baurhoo Bushansingh, Eveline Ibeagha-Awemu, Pierre Lacasse, Daniel Lefebvre, Bruce Murphy, Débora Santschi

Affiliate Member

René Lacroix

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

Thesis Courses (36 credits)

ANSC 680	(9)	M.Sc. Thesis 1
ANSC 681	(9)	M.Sc. Thesis 2
ANSC 682	(9)	M.Sc. Thesis 3
ANSC 683	(9)	M.Sc. Thesis 4

Required Courses (9 credits)

6 credits of coursework at the 500 level or higher approved by the student's advisory committee, and three 1-credit seminars.

ANSC 695	(1)	MSc General Topic Seminar
ANSC 696	(1)	MSc Research Proposal Seminar
ANSC 697	(1)	MSc Research Results Seminar

Depending on the needs and competencies of the student, additional coursework may be assigned by the supervisory committee.

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

The program aims to provide 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.

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

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).

Master of Science,

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

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
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 (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 from one domain to another 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 offered by collaborating departments and faculties at the University

12.3.3 Bioresource Engineering Admission Requirements and Application Procedures

12.3.3.1 Admission Requirements

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

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

12.3.3.2 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 Procn Pr*

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

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, investigate project possibilities and plan a program of study.

Research Project (12 credits)

BREE 671	(6)	Project 1
BREE 672	(6)	Project 2

Required Courses (2 credits)

BREE 651	(1)	Departmental Seminar M.Sc. 1
BREE 652	(1)	Departmental Seminar M.Sc. 2

Complementary Courses (31 credits)

31 credits of 500-, 600-, or 700-level courses in bioresource engineering and other fields* to be determined in consultation with the Project Director.

* Note: 12 of the 31 credits are expected to be from collaborative departments, e.g., food process engineering: 12 credits divided between Food Science and Chemical Engineering.

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

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

Research Project (12 credits)

BREE 671	(6)	Project 1
BREE 672	(6)	Project 2

Required Courses (8 credits)

BREE 651	(1)	Departmental Seminar M.Sc. 1
BREE 652	(1)	Departmental Seminar M.Sc. 2
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 (25 credits)

3 credits from the following courses below:

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

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

22 additional credits of 500-, 600-, or 700-level courses 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.

Research Project (6 credits)

BREE 671*	(6)	Project 1
BREE 672	(6)	Project 2

* BREE 671 may also be taken as part of this requirement.

Required Courses (9 credits)

BREE 533	(3)	Water Quality Management

CHEE 591	(3)	Environmental Bioremediation
CIVE 615	(3)	Environmental Engineering Seminar

Complementary Courses (19 credits)

Data Analysis Course

3 credits from the following:

AEMA 611	(3)	Experimental Designs 1
CIVE 555	(3)	Environmental Data Analysis
PSYC 650	(3)	Advanced Statistics 1

Toxicology Course

3 credits from the following:

OCCH 612	(3)	Principles of Toxicology
OCCH 616	(3)	Occupational Hygiene

Water Pollution Engineering Course

4 credits from the following:

CIVE 651	(4)	Theory: Water / Wastewater Treatment
CIVE 652	(4)	Bioprocesses for Wastewater Resource Recovery
CIVE 660	(4)	Chemical and Physical Treatment of Waters

Air Pollution Engineering Course

3 credits from the following:

CHEE 592	(3)	Industrial Air Pollution Control
MECH 534	(3)	Air Pollution Engineering

or an approved 500-, 600-, or 700-level alternative course.

Environmental Impact Course

3 credits from the following:

GEOG 501	(3)	Modelling Environmental Systems
GEOG 551	(3)	Environmental Decisions

or an approved 500-, 600-, or 700-level alternative course.

Environmental Policy Course

3 credits from the following:

URBP 506	(3)	Environmental Policy and Planning

or an approved 500-, 600-, or 700-level alternative course.

Further complementary courses (balance of coursework to meet the 45-credit program requirement):

Remaining Engineering or Non-Engineering courses from an approved list of courses, at the 500, 600, or 700 level, from the Faculty of Engineering, Faculty of Agricultural and Environmental Sciences, Faculty of Law, Faculty of Religious Studies, Desautels Faculty of Management, and Departments of Atmospheric

12.3.11 Master of Science, Applied (M.Sc.A.) Bioresource Engineering (Non-Thesis): Integrated Food and Bioprocessing (45 credits)

Required Courses (6 credits)

BREE 600	(1)	Project/Internship Proposal
BREE 651	(1)	Departmental Seminar M.Sc. 1
BREE 652	(1)	Departmental Seminar M.Sc. 2
BREE 699	(3)	Scientific Publication

Complementary Courses (39 credits)

Minimum of 3 credits of graduate-level Statistics in any department

Minimum of 9 credits from courses selected from the following:

BREE 518	(3)	Ecological Engineering
BREE 519	(3)	Advanced Food Engineering
BREE 520	(3)	Food, Fibre and Fuel Elements
BREE 530	(3)	Fermentation Engineering
BREE 531	(3)	Post-Harvest Drying
BREE 532	(3)	Post-Harvest Storage
BREE 535	(3)	Food Safety Engineering
BREE 603	(3)	Advanced Properties: Food and Plant Materials

Minimum of 12 credits selected from the following:

BREE 601	(6)	Integrated Food and Bioprocessing Internship 1
BREE 602	(6)	Integrated Food and Bioprocessing Internship 2
BREE 671	(6)	Project 1
BREE 672	(6)	Project 2

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.

12.3.12 Doctor of Philosophy (Ph.D.) Bioresource Engineering

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

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

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

Complementary Courses

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

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

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must sho

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 equivalent with a minimum cumulative grade point average (CGPA) of 3.2/4.0, as well as all prerequisites or their equivalents. Applicants are required to have sufficient background in biochemistry, cellular biology, and molecular biology, preferably at an advanced level for the Master's Applied.

Financial Support

Financial support for the Biotechnology program is very limited. 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 by the student. Students, whether Canadian or international, must secure funding from available sources, or must be self-financed. International students are strongly encouraged to secure funding from their home country or international agencies. Academic units cannot guarantee financial support via teaching assistantships or other funds. More information is found at *www.mcgill.ca/biotechgradprog/admissions/tuition*.

12.4.3.2 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.

12.4.3.2.1 Additional Requirements

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

- An *English Proficiency test* is required for most international applicants.
- The GRE (optional).
- Other Supporting Documents – Other documents may be required for the admission process. Please consult the Biotechnology website at *www.mcgill.ca/biotechgradprog/admissions* for full details of the admission process.

12.4.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the 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*.

Application Opening Dates	Application Deadlines	
	Canadian citizens/Perm. residents of Canada (incl. Special, V	Current McGill Students (any citizenship)

Required Courses (20 credits)

BIOT 505	(3)	Selected Topics in Biotechnology
BTEC 501	(3)	Bioinformatics
BTEC 619	(4)	Biotechnology Laboratory 2
BTEC 620	(4)	Biotechnology Laboratory 1
BTEC 621	(3)	Biotechnology Management
HGEN 660	(3)	Genetics and Bioethics

Complementary Courses (9 credits)

9 credits at the 500 level or higher, selected within the Faculties of Agricultural and Environmental Sciences, Medicine, Science, or Management in consultation with the academic adviser of the program in line with the interests of the student.

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

** This program is currently not offered. **

Required Courses (10 credits)

BIOT 505	(3)	Selected Topics in Biotechnology
BTEC 620	(4)	Biotechnology Laboratory 1
BTEC 621	(3)	Biotechnology Management

Complementary Courses (6 credits)

Two courses chosen from the following:

General Topics

ANSC 622	(3)	Experimental Techniques in Animal Science
BINF 511	(3)	Bioinformatics for Genomics
BIOL 524	(3)	Topics in Molecular Biology
BIOL 568	(3)	Topics on the Human Genome
BTEC 501	(3)	Bioinformatics
BTEC 502	(3)	Biotechnology Ethics and Society
BTEC 535	(3)	Functional Genomics in Model Organisms
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. 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 events and issues that emerge in Canada and globally. The program covers food safety through the entire food supply chain from food production through processing/manufacturing to the food consumer. A strong undergraduate background in food science and particularly in microbiology is required. Students must complete a total of 45 credits including ten graduate-level courses, the graduate seminar, and the research project. The program may be completed in three to four academic terms (12 to 16 months). Students may also be required to complete selected undergraduate courses as determined by the Department at the time of admission.

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

This program is a research-based degree in various areas related to food science for candidates entering the M.Sc. program without restrictions (i.e., not requiring a Qualifying term/year). Entry into the M.Sc. (Thesis) program also hinges on the availability of supervisory staff and financing. Therefore, it is

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

advisable that the applicant for the M.Sc. (Thesis) degree select the M.Sc. (Non-Thesis) as a second choice in the application form, to enhance the possibility of entry into the Food Science graduate program. Subsequent career paths include work within the food industry, government agencies, and in research.

section 12.5.8: Doctor of Philosophy (Ph.D.) Food Science and Agricultural Chemistry

A Ph.D. in food science is suitable for students with an M.Sc. degree in food science or related areas who wish to become independent researchers and/or leaders in the field of food science. Candidates with a B.Sc. degree applying for the Ph.D. need to register first for the M.Sc. degree. In cases where the candidates are performing well during their first year, they may be permitted to fast track to the Ph.D. degree. Entry into the Ph.D. graduate program hinges on the availability of supervisory staff and financing.

12.5.3 Food Science and Agricultural Chemistry Admission Requirements and Application Procedures

12.5.3.1 Admission Requirements

Applicants to the M.Sc. programs must be graduates of a university of recognized reputation and hold a B.Sc. in Food Science or a related discipline such as Chemistry, Biochemistry, or Microbiology with a minimum cumulative grade point average (CGPA) of 3.0/4.0 (second class–upper division) and a minimum grade point average (GPA) of 3.2/4.0 during the last two years of full-time university study. Applicants to the Ph.D. program must hold an M.Sc. degree in Food Science or related areas with a minimum CGPA of 3.4 in their M.Sc. and a minimum GPA of 3.2 for the last two years of their B.Sc. degree. High grades are expected in courses considered by the academic unit to be preparatory to the graduate 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 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 for students in thesis programs is very limited and highly competitive. Students in non-thesis master's programs must be self-funded. 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 by the student and/or the student's supervisor. While the Department cannot guarantee financial support, students can apply for teaching assistantships and other scholarships.

12.5.3.2 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.

12.5.3.2.1 Additional Requirements

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

- Final acceptance to the M.Sc. Thesis or Ph.D. program depends on a faculty member agreeing to serve as the student's supervisor. A supervisor is not required for acceptance to the M.Sc. Non-Thesis program.
- The GRE – not required, but highly recommended.
- Proof of funding (all graduate programs, international applicants only): Documents must be provided in the application to prove that funding is available

	Application Opening Dates		Application Deadlines	
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.(Br. Col.)

Professors

Hosahalli S. Ramaswamy; B.Sc.(B'lore), M.Sc., Ph.D.(Br. Col.)

Benjamin K. Simpson; B.Sc.(KNUST, Ghana), Ph.D.(Nfld.)

Varoujan A. Yaylayan; B.Sc.(Beirut), M.Sc., Ph.D.(Alta.)

Associate Professors

Saji George; B.Sc., M.Sc.(Mahatma Gandhi, Kerala), Ph.D.(NUS)

Ashraf A. Ismail; B.Sc., Ph.D.(McG.)

Salwa Karboune; B.Sc., M.Sc.(Hassan II, Rabat), D.E.A., Ph.D.(Aix-Marseille)

Assistant Professor

Stephane Bayen; B.Sc.(ENSCM), M.Sc.(NUS), M.Eng.(ENSCM), Ph.D.(NUS)

Jennifer Ronholm; B.Sc.(Wat.), Ph.D.(Ott.) (*joint appt. with Animal Science*)

Yixiang Wang; B.Sc., Ph.D.(Wuhan)

Adjunct Professors

Luis Garcia; M.Sc.(Guelph)

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

Professors Post-Retirement

Selim Kermasha; B.Sc.(Baghdad), D.Sc.(Nancy)

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 Pro43.992 Tm(h -6)

The research presented must meet current standards of the discipline; as well, the thesis must clearly demonstrate how the research advances knowledge in the field. Finally, the thesis must be written in compliance with norms for academic and scholarly expression and for publication in the public domain.

Required Courses (9 credits)

Note: Candidates should be prepared to take the Comprehensive Preliminary Examination before the end of the second year of the program.

FDSC 700	(0)	Comprehensive Preliminary Examination
FDSC 725	(3)	Advanced Topics in Food Science
FDSC 797	(3)	Ph.D. Graduate Seminar 1
FDSC 798	(3)	Ph.D. Graduate Seminar 2

12.6 Human Nutrition

12.6.1 Location

School of Human Nutrition

of clinical nutrition, community nutrition, and foodservice management; French competenc

- Graduate Record Exam (GRE) – The GRE is required for all Ph.D. applicants to the School of Human Nutrition who are submitting non-Canadian or non-U.S. transcripts.

12.6.3.3 Application Dates and Deadlines

Application opening dates are set by Enrolment Services in consultation with Graduate and Postdoctoral Studies (GPS), while application deadlines are set by the School of Human Nutrition 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 1	March 1	March 1
Winter Term*:	Feb. 15*	June 1*	Oct. 1*	Oct. 1*
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 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.

12.6.4 Human Nutrition Faculty

Director

Linda J. Wykes

Emeritus Professor

Harriet V. Kühnlein; B.S.(Penn. St.), M.S.(Ore. St.), Ph.D.(Calif.), R.D.

Timothy A. Johns; B.Sc.(McM.), M.Sc.(Br. Col.), Ph.D.(Mich.)

Professors

Luis B. Agellon; B.Sc., Ph.D.(McM.)

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-Quiñonez; 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 Laboratories*)

Faculty Lecturers

Paul-Guy Duhamel; B.Sc.(McG.), M.Sc.(Montr.), Dt. P. (*Manager, Food and Nutrition Laboratories*)

Mary Hendrickson; B.A.(St. Benedict), B.Sc.(Minn.), M.Sc.(Colo. St.), Dt. P.

Joane Routhier; B.Sc.(McG.)

Sessional Lecturers

Peter Bender; B.Ed., M.A.(McG.), Ph.D.(Flor. St.)

Francesca Cambria; B.Com., Gr.Dip(C'dia)

Diana Dallmann; B.Sc.(National University of Asunción), M.Sc.(Nuestra Señora de la Asunción)

Michèle Iskandar; B.Sc., M.Sc.(American University of Beirut), Ph.D.(McG.)

Steven Landry; B.Com., B.Ed., M.B.A.(McG.)

Patrick Owen; B.Sc., M.Sc., Ph.D.(McG.)

Dina Spigelski; B.A., B.Sc., M.Sc.(McG.)

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

Thesis Courses (33 credits)

NUTR 680	(7)	Human Nutrition M.Sc. Thesis 1
NUTR 681	(8)	Human Nutrition M.Sc. Thesis 2
NUTR 682	(9)	Human Nutrition M.Sc. Thesis 3
NUTR 683	(9)	Human Nutrition M.Sc. Thesis 4

Required Courses (3 credits)

NUTR 695	(1)	Human Nutrition Research Orientation
NUTR 696	(1)	Human Nutrition Seminar
NUTR 697	(1)	MSc Final Presentation

Complementary Courses (9 credits)

3 credits in graduate-level statistics

3 credits in graduate-level research methods

3 credits in graduate-level courses (chosen in consultation with supervisory committee)

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

This program is open to students with a B.Sc. in nutrition or an allied health profession, including biochemistry, kinesiology, physiology, or other related field, who would like to become a member of the Ordre professional des diététistes du Québec. Students may be required to complete a qualifying year (a variable number of required undergraduate credits), before taking the required M.Sc.Applied professional course, complementary courses, and elective courses (46 credits), followed by a Stage (Internship) component, which includes a practice based project (37 credits). On completion, students will meet OPDQ credits and professional practice requirements for licensure as a registered dietitian. A basic level or professional French competency will be required to complete the professional practice Stage component. The entrance requirements of a CGPA of 3.5 must be maintained throughout the program.

Required Courses (74 credits)

NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 505	(3)	Public Health Nutrition
NUTR 513	(3)	Credentialing in Dietetics
NUTR 515	(1)	Dietetics French Examination
NUTR 545	(4)	Clinical Nutrition 2
NUTR 546	(4)	Clinical Nutrition 3
NUTR 551	(3)	Analysis of Nutrition Data
NUTR 606	(3)	Human Nutrition Research Methods
NUTR 607	(3)	Counselling in Professional Practice
NUTR 611	(3)	Graduate Professional Practice 1
NUTR 612	(8)	Graduate Professional Practice 2 Management
NUTR 613	(7)	Graduate Professional Practice 3 Clinical Nutrition
NUTR 614	(8)	Graduate Professional Practice 4 Community Nutrition
NUTR 615	(7)	Graduate Prof Practice 5 Clinical Nutrition
NUTR 625	(1)	Emerging Issues for Nutritionists
NUTR 626	(2)	Writing for Dietetics Practice
NUTR 629	(6)	Professional Dietetics Project

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

(6 credits)

6 credits from the following:

AEMA 610	(3)	Statistical Methods 2
ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
ANSC 560	(3)	Biology of Lactation
EDKP 654	(3)	Sport Psychology
EDPC 501	(3)	Facilitating Relationships
EDPC 504	(3)	Communication and Critical Conflict Resolution
EDPE 502	(3)	Theories of Human Development
EPIB 507	(3)	Biostats for Health Sciences
FDSC 537	(3)	Nutraceutical Chemistry
FDSC 538	(3)	Food Science in Perspective
FDSC 545	(3)	Advances in Food Microbiology
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 502	(3)	Independent Study 2
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data
NUTR 608	(3)	Special Topics 1
NUTR 610	(3)	Maternal and Child Nutrition
NUTR 641	(3)	Advanced Global Food Security
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

M.Sc. (Applied) Practicum 4M.Sc. ((45 credit 1 165.864 1m(M.Sc165.864 1m Applied (M.Sc.A..9(NUTR 658)Tj3.1sct

M.Sc. (Applied) Literature Review

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
NUTR 695	(1)	Human Nutrition Research Orientation
NUTR 696	(1)	Human Nutrition Seminar

Complementary Courses (18 credits)

3 credits of 500-level or higher Statistics.

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

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, org

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

The Graduate Diploma in Registered Dietitian Credentialing is open to students with a Ph.D. in Human Nutrition from the School of Human Nutrition who would like to become a member of the Ordre professional des diététistes du Québec (OPDQ). The Diploma consists of 30 weeks of stage placements in Clinical, Community, and Management rotations. Before acceptance into the program, students will be required to complete courses in clinical nutrition, and certain required courses in preparation for Stage; and to demonstrate a basic level of French competency. This preparation may be done during the Ph.D. program, or in a qualifying year after the Ph.D. On completion, students will meet OPDQ credits and professional practice requirements for licensure as a registered dietitian.

The Graduate Diploma is open to students who have completed a graduate degree with the School of Human Nutrition including NUTR 513 Credentialing in Dietetics.

Required Courses (30 credits)

NUTR 612	(8)	Graduate Professional Practice 2 Management
NUTR 613	(7)	Graduate Professional Practice 3 Clinical Nutrition
NUTR 614	(8)	Graduate Professional Practice 4 Community Nutrition
NUTR 615	(7)	Graduate Prof Practice 5 Clinical Nutrition

12.7 Natural Resource Sciences

12.7.1 Location

Department of Natural Resource Sciences
McGill University, Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue QC H9X 3V9
Aquired Cour052 Tw/F1 8.1i6146asic le

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

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

Please contact the Department for more information about this program.

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

Please contact the Department for more information about this program.

section 12.7.9: Master of Science (M.Sc.) Microbiology (Thesis) (45 credits)

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 as well as 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 12.7.10: Master of Science (M.Sc.) Microbiology (Thesis): Environment (46 credits)

Please contact the Department for more information about this program.

section 12.7.11: Master of Science (M.Sc.) Renewable Resources (Thesis) (45 credits)

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, fish and fisheries biology, landscape ecology, limnology, micrometeorology, soil science, and wildlife biology. They 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 12.7.12: Master of Science (M.Sc.) Renewable Resources (Thesis): Environment (46 credits)

Please contact the Department for more information about this program.

section 12.7.13: Master of Science (M.Sc.) Renewable Resources (Thesis): Neotropical Environment (48 credits)

Please contact the Department for more information about this program.

section 12.7.14: 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 12.7.15: 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 12.7.16: Doctor of Philosophy (Ph.D.) Entomology: Environment

Please contact the Department for more information about this program.

section 12.7.17: Doctor of Philosophy (Ph.D.) Entomology: Neotropical Environment

Please contact the Department for more information about this program.

section 12.7.18: Doctor of Philosophy (Ph.D.) Microbiology wd oo5Tj 781 120f 1 0 0 1 70.52 704.98 Tm (Please contact the 51 02ment for more informati

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 the 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.

in graduate studies, **but not as candidates for a degree**

12.7.5 Master of Science (M.Sc.) Agricultural Economics (Thesis) (45 credits)

Graduate students receive rigorous training in economic theory, institutional economics, and quantitative methods, with a focus on applying economic concepts and tools to identify, define, analyze, and solve economic problems in the agri-food sector and the environment. The ideal prior preparation is an undergraduate degree in Agricultural Economics or Economics, including undergraduate courses in intermediate economic theory (micro and macro), calculus, algebra, statistics, and econometrics.

Attention is given to analytical skills in the broad areas of agricultural and environmental economics. Students may specialize, by way of their research program, in agribusiness, resource economics, development, finance, marketing, trade, policy, and environmental economics. The program is intended to prepare graduates for rewarding careers in research, analysis, and decision-making in academia, private, NGO, and government sectors.

Thesis Courses (24 credits)

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

Required Course (3 credits)

AGEC 690	(3)	Seminar in Agricultural Economics

Complementary Courses (18 credits)

6 credits, two theory courses chosen from:

ECON 610	(3)	Microeconomic Theory 1
ECON 620	(3)	Macroeconomic Theory 1

or a theory course, at the 500 level or higher, approved by the Graduate Program Director.

At least 3 credits of quantitative methods course chosen from:

ECON 662D1	(3)	Econometrics
ECON 662D2	(3)	Econometrics
ECON 665	(3)	Quantitative Methods

or a quantitative course, at the 500 level or higher, approved by the Graduate Program Director.

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
		Eronmental Poli (Thesis):(3)

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.

12.7.9 Master of Science (M.Sc.) Microbiology (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 500-, 600-, or 700-level courses; normally one of these will be a course in statistics.

12.7.10 Master of Science (M.Sc.) Microbiology (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 Course (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.

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.

NRSC 613	(3)	Strategic and Sectoral Environmental Assessment
NRSC 614	(3)	Special Topics 7

Complementary Courses (6 credits)

500- or 600-level relevant courses to be chosen in consultation with the Supervisor and Program Director.

12.7.15 Doctor of Philosophy (Ph.D.) Entomology

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.

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

Thesis

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

Required Courses

ENVR 610	(3)	Foundations of Environmental Policy
ENVR 650	(1)	Environmental Seminar 1
ENVR 651	(1)	Environmental Seminar 2
ENVR 652	(1)	Environmental Seminar 3
NRSC 701	(0)	Ph.D. Comprehensive Examination
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.

Complementary Courses

One course chosen from the following:0s0s

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.

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

Thesis

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

Required Courses

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.

12.7.18 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

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 objectiv

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Canada
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Email: *gradstudies.macdonald@mcgill.ca*
Website: *www.mcgill.ca/parasitology*

12.8.2 About Parasitology

The Institute of P

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 support is very 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 by the student and/or the student's supervisor. Academic units cannot guarantee financial support via teaching assistantships or other funds. 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/internalawar*

12.8.4 Parasitology Faculty

PARA 655	(3)	Host-Parasite Interactions

Other course work in related subjects may be required, depending upon the candidate's background and research orientation.

Doctor of Philosophy (Ph.D.) P

12.8.8 Doctor of Philosophy (Ph.D.) Parasitology: Environment

Thesis

A thesis for the doctoral degree must constitute original scholarship and must be a distinct contribution to knowledge. It must show familiarity with previous w

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.

- Acceptance to all programs depends on a staff member agreeing to serve as the student's supervisor and the student obtaining financial support.
- The GRE – not required, but highly recommended.

12.9.3.3 Application Dates and Deadlines

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

	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 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.

12.9.4 Plant Science Faculty

Chair

Martina V. Stromvik

Emerita Professor

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

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

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
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.

12.9.7 Master of Science (M.Sc.) Plant Science (Thesis): Environment (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 (6 credits)

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

Complementary Courses (3 credits)

Chosen from 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 other graduate course recommended by the Advisory Committee and approved by the Environment Option Committee.

Additional courses may be required at the discretion of the candidate's Supervisory Committee.

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

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

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 (6 credits)

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

Elective Courses (3 credits)

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

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

12.9.9 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.

12.9.10 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

Required Courses

* Must be taken within one year of registering

PLNT 701	(0)	Doctoral Comprehensive Examination

Complementary Courses

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

12.9.11 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

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.

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

Thesis

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

Required Invitational Seminar

PLNT 690	(0)	Research Horizons in Plant Science 1

Required Courses (6 credits)

* Must be taken within the first year of registering

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
PLNT 701*	(0)	Doctoral Comprehensive Examination

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.

Complementary Courses (3 credits)

One course chosen from the following:

ENVR 519	(3)	Global Environmental Politics
ENVR 544	(3)	Environmental Measurement and Modelling
ENVR 620	(3)	Environment and Health of Species

ENVR 622	(3)	Sustainable Landscapes
ENVR 630	(3)	Civilization and Environment
ENVR 680	(3)	Topics in Environment 4

or other graduate course recommended by the Advisory Committee and approved by the Environment Option Committee.

12.9.13 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 approv

COMP 616N2	(1.5)	Bioinformatics Seminar
COMP 618	(3)	Bioinformatics: Functional Genomics
GLIS 673	(3)	Bioinformatics Resources
	d the Human Genome	Beyond the Human Genome