



**Faculty of Agricultural and Environmental  
Sciences, including School of Human Nutrition  
Programs, Courses and University Regulations  
2018-2019**



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## 1 About the Faculty of Agricultural and Environmental Sciences, including School of Human Nutrition

**Mission Statement:** The Faculty of Agricultural and Environmental Sciences is committed to excellence in teaching, research, and service to ensure that humanity's present and future food, health, and natural resource needs are met while protecting the environment.

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## 2 History of the Faculty

Dedicated to improving the quality of life in Quebec's rural communities, Sir William Christopher Macdonald founded the School of Agriculture, the School for Teachers, and the School of Household Science at Macdonald College in Sainte-Anne-de-Bellevue in 1906. Macdonald College opened its doors to students in 1907 and its first degrees were awarded in 1911. The School for Teachers became the Faculty of Education in 1965 and moved to the downtown campus in 1970.

Currently, Macdonald Campus is home to the Faculty of Agricultural and Environmental Sciences, the School of Human Nutrition, and the Institute of Parasitology. The Faculty is comprised of the Departments of Animal Science, Bioresource Engineering, Food Science and Agricultural Chemistry, Natural Resource Sciences, and Plant Science. The Faculty is one of the founding members of the McGill School of Environment, and is also home to the Farm Management and Technology Program. The current enrolment is just short of 2,000 undergraduate and graduate students.

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## 3 Macdonald Campus Facilities

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### 3.1 Morgan Arboretum

The Morgan Arboretum has 245 hectares of managed and natural woodlands, fields, and tree plantations used for environmental research and teaching in a wide range of courses. Eighteen formal tree collections contain groups of Canadian native trees and many useful and important exotics. In addition, over 170 species of birds, 30 species of mammals, and 20 species of reptiles and amphibians seasonally inhabit the property. Finally, the Arboretum features 25 kilometers of ski, snowshoe, and walking trails, a variety of forest ecosystems, conservation projects, and forest operations such as maple syrup production. A nature interpretation program is also offered. More information is available at [www.mcgill.ca/nrs/facilities/arboretum](http://www.mcgill.ca/nrs/facilities/arboretum).

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### 3.2 Macdonald Campus Library

Located in the Barton Building, the Macdonald Campus Library offers outstanding collections, facilities, and services to support a broad range of information needs. The Library's collections encompass a vast range of research material with a specific focus on the areas of agricultural sciences, nutrition, and environmental sciences.

The Library's website leads users to a wealth of information, including the library catalogue, article databases, McGill theses, and instructive web pages on how to gain access to the material and services available to users. The Library's eZone computers provide specialized software such as ArcGIS, STATA, and EndNote. Comfortable seating, three group study rooms equipped with LCD monitors, and a 24-hour study area are also available to you.

Librarians specializing in specific subject areas are available to help you find information for your course assignments or research topics, either in person or by phone, email, or chat. Research workshops are provided throughout the year.

More information is available at [www.mcgill.ca/library/branches/macdonald](http://www.mcgill.ca/library/branches/macdonald), or feel free to drop by.

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### 3.3 Macdonald Campus Computing Centre

The Macdonald Campus Computing Centre is managed by McGill's IT Customer Services (ICS) unit. Undergraduate computing labs are open 24/7, year round. The labs offer computers running Microsoft Office software, scanners, and printers.

The IT walk-in support office, located in the Macdonald-Stewart Building, Room MS 2-025, is open Monday to Friday from 9:00 a.m. to 5:00 p.m. For support on all central IT services, contact the ICS Service Desk by email at [ITsupport@mcgill.ca](mailto:ITsupport@mcgill.ca) or call 514-398-3398.

For more information and to search the IT Knowledge Base, visit the IT Services web page at [www.mcgill.ca/it](http://www.mcgill.ca/it).

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### **3.4 Lyman Entomological Museum and Research Laboratory**

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Originally established in 1914 and formerly housed in the Redpath Museum, the Lyman Entomological Museum was moved to the Macdonald campus in 1961. It houses the largest university collection of insects in Canada, second in size only to the National Collection. The Museum also has an active graduate research program in association with the Department of Natural Resource Sciences. Study facilities are available, on request from the Curator, to all bona fide students of entomology. Visits by other interested parties can be arranged by calling 514-398-7914. More information is available at [lyman.mcgill.ca](http://lyman.mcgill.ca).

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### **3.5 Brace Centre for Water Resources Management**

The Brace Centre for Water Resources Management is located on the Macdonald campus. It is a multidisciplinary and advanced research and training centre of McGill University, dedicated to solving problems of water management for all human and environmental uses. It brings together staff from several McGill faculties to undertake research, teaching, specialized training, and policy and strategic studies, both in Canada and internationally. The Centre draws on the wide range of f

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### 4.3 Administrative Officers

#### Dean, Faculty of Agricultural and Environmental Sciences, and Associate Vice-Principal (Macdonald Campus)

Anja Geitmann; Diplom(Konstanz), Ph.D.(Siena)

#### Associate Deans

James W. Fyles; B.Sc., M.Sc.(Vic., BC), Ph.D.(Alta.) (*Student Affairs*)

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#### 4.5.1 Student Rights and Responsibilities

The regulations and policies governing student rights and responsibilities at McGill University are published jointly by the Dean of Students' Office and the Secretariat and can be found at [www.mcgill.ca/secretariat/policies-and-regulations](http://www.mcgill.ca/secretariat/policies-and-regulations).

#### 4.5.2 The Student Affairs Office

The Student Affairs Office, located in Laird Hall, Room 106, provides a wide variety of academic services. These include information about admission (prerequisites and program requirements), academic standing, examinations (deferrals, conflicts, rereads), exchange programs, inter-faculty transfers, program changes, registration (course change, withdrawals), scholarships (entrance and in-course), second degrees, second majors, minors, study away, and graduation (convocation).

Website: [www.mcgill.ca/macdonald/studentinfo/sao](http://www.mcgill.ca/macdonald/studentinfo/sao)

#### 4.5.3 Student Services

Please see [University Regulations and Resources > Undergraduate > Student Services > : Student Services – Macdonald Campus](#). Further information is also available on our website: [www.mcgill.ca/macdonald-studentservices](http://www.mcgill.ca/macdonald-studentservices).

All Student Services, whether at the Macdonald or the Downtown campuses, fall under the direction of the Office of the Executive Director, Services for Students; see : [Office of the Senior Director, Services for Students](#).

#### 4.5.4 Macdonald Campus Residences

Please see [University Regulations and Resources > Undergraduate > Residential Facilities > : University Residences – Macdonald Campus](#); [www.mcgill.ca/students/housing/macdonald](http://www.mcgill.ca/students/housing/macdonald); or email [residences.macdonald@mcgill.ca](mailto:residences.macdonald@mcgill.ca).

#### 4.5.5 Student Life

All undergraduate and Farm Management and Technology students are members of the [Macdonald Campus Students' Society](#). The MCSS, through the Students' Council, is involved in numerous campus activities such as social events, academic affairs, and the coordination of clubs and organizations.

The [Macdonald Campus Graduate Students' Society](#) (MCGSS) represents graduate students on the Macdonald Campus. MCGSS is part of McGill's [Post-Graduate Students' Society](#) (PGSS) which represents all graduate students at McGill.

#### 4.5.6 Fees

Please refer to the [Student Accounts](#) website for information and step-by-step instructions regarding fees.

##### 4.5.6.1 Tuition Fees

General information on tuition and other fees is found in [University Regulations & Resources > Undergraduate > : Fees](#).

##### 4.5.6.2 Other Expenses

In addition to tuition fees and the cost of accommodation and meals, you should be prepared to spend a minimum of \$1,000 (depending on your program) on prescribed textbooks and classroom supplies. These may be purchased at the [MCSS Bookstore](#) in the Centennial Centre.

Uniforms are required for food laboratories. If you are in the B.Sc.(Nutr.Sc.) program, you will be advised of the uniform requirements on acceptance or promotion.

#### 4.5.7 Immunization for Dietetics Majors

As a student in the Dietetics Major, you are required to initiate and complete the Compulsory Immunization Program for Health Care Students in Fall of U1, in the NUTR 208 Professional Practice Stage 1A course. Students will meet with our health nurse at the beginning of U1 and should have all previous vaccination records available at that time. Participation in any further Professional Practice (Stage) courses in the Dietetics program will only be permitted if all immunization requirements are complete. Updates to your immunizations may be required during your program. For full details, see [www.mcgill.ca/studenthealth/immunize/forms](http://www.mcgill.ca/studenthealth/immunize/forms).

#### 4.5.8 Language Requirement for Professions

Quebec law requires that candidates seeking admission to provincially recognized Quebec professional corporations or *Ordres* have a working knowledge of the French language, i.e., be able to communicate verbally and in writing in that language. Agrologists, chemists, dietitians, and engineers are among those within this group.





2. If you are in Probationary Standing, you may register for no more than 14 credits per term.
3. While in Probationary standing, you must achieve a TGPA of 2.50 to continue in Probationary Standing or a CGPA of 2.00 in order to return to Satisfactory Standing. Failure to meet at least one of these conditions will result in Unsatisfactory Standing. (In the case of Fall term, this will be Interim Unsatisfactory Standing and the rules for Probationary Standing will apply.)
4. When your CGPA (or TGPA in the first term of the program) falls below 1.50, your Academic Standing becomes Unsatisfactory and you must withdraw. (In the case of Fall term, the standing will be Interim Unsatisfactory standing and the rules for Probationary standing will apply.)
5. If you are in Unsatisfactory Standing, you may not continue in your program. You may apply for readmission only after your registration has been interrupted for at least one term (not including Summer term).
6. Readmission will be in the Standing Unsatisfactory/Readmit and a CGPA of 2.00 must be achieved to return to Satisfactory standing or a TGPA of 2.50 must be achieved for Probationary Standing. If you fail to meet at least one of these conditions, you will be required to withdraw permanently.
7. Studentst2e a e a

#### **4.6.8.1 Procedures for Minor Programs**

If you want to register for a Minor program, you must complete a Minor Approval form (usually at the beginning of your U2 year), and return it duly completed to the Student Affairs Office. The Minor program will then be added to your record and will automatically continue each year unless you officially cancel it in writing. If you want to cancel the Minor, you must notify both the Minor Adviser and the Student Affairs Office. The Minor Approval form is available on the Faculty website and in the Student Affairs Office, Laird Hall, Room 106.

#### **4.6.9 Course Change Information**

- 1. Courses:** please refer to [University Regulations and Resources](#) > *Undergraduate* > *Registration* > : *Course Change Period*, and the *Important Dates website*.
- 2. Course withdrawal** (Transcript notation of “W”): please refer to [University Regulations and Resources](#) > *Undergraduate*



**Note for B.Eng.(Bioresource) students:** If you are completing a B.Eng.(Bioresource) degree, you must complete a minimum residency requirement of 72 credits at McGill. Note that the total credits for your program (143 credits) includes those associated with the year 0 (Freshman) courses.

#### 4.6.15 Graduation Honours

For information on the designation of graduation honours and awards, see [University Regulations and Resources](#) > Undergraduate > Graduation > [Graduation Honours](#).

#### 4.6.16 Scholarships, Bursaries, Prizes, and Medals

Various scholarships, bursaries, prizes, and medals are open to entering, in-course, and graduating students. No application is required. Full details of these are set out in the [Undergraduate Scholarships and Awards Calendar](#), available at [www.mcgill.ca/studentaid](http://www.mcgill.ca/studentaid).

## 5 Overview of Programs Offered

The Faculty of Agricultural and Environmental Sciences and the School of Human Nutrition offer degrees, certificates, and diplomas in:

- Bachelor of Engineering (Bioresource Engineering)
- Bachelor of Science (Agricultural and Environmental Sciences)
- Bachelor of Science (Food Science)
- Bachelor of Science (Nutritional Sciences)
- Concurrent degree program in Food Science and Nutritional Sciences
- Certificate in Ecological Agriculture
- Certificate in Food Science
- Diploma in Environment
- Diploma of Collegial Studies in Farm Management and Technology

The Faculty of Agricultural and Environmental Sciences is one of the four faculties in partnership with the McGill School of Environment.

Several programs offered by the Faculty and School lead to professional accreditation. These include:

- the Agricultural Economics Major and the Agro-Environmental Sciences Major – membership in the *Ordre des agronomes du Québec* and other provincial Institutes of Agriculture;
- Bioresource Engineering – membership as a professional engineer in any province of Canada and the *Ordre des agronomes du Québec*;
- the Dietetics Major – membership in the Dietitians of Canada and the *Ordre professionnel des diététistes du Québec*;
- Food Science – accreditation by the Institute of Food Technologists and professional accreditation by the *Ordre des chimistes du Québec*.

Professional Practice experiences to complete the Dietetics practicum are provided in the McGill teaching hospitals and in a wide variety of health, education, business, government, and community agencies.

The Faculty also offers M.Sc. and Ph.D. programs in a variety of areas. Further information about these programs is available in the Faculty of Agricultural and Environmental Studies [Graduate and Postdoctoral Studies](#) section.

### Programs Offered by the Faculty of Agricultural and Environmental Sciences

[section 6.2: Bachelor of Science \(Agricultural and Environmental Sciences\) – B.Sc.\(Ag.Env.Sc.\)](#)

[section 6.3: Bachelor of Engineering \(Bioresource\) – B.Eng.\(Bioresource\)](#)

[section 6.4: Bachelor of Science \(Food Science\) - B.Sc.\(F.Sc.\)](#)

[section 6.5: Bachelor of Science \(Nutritional Sciences\) – B.Sc.\(Nutr.Sc.\)](#)

[section 5.7: Concurrent Bachelor of Science in Food Science – B.Sc.\(F.Sc.\) and Bachelor of Science in Nutritional Sciences – B.Sc.\(Nutr.Sc.\) \(Overview\)](#)

[section 5.8: Honours Programs \(Overview\)](#)

[section 5.9: Minor Programs \(Overview\)](#)

[section 5.10: Post-Baccalaureate Certificate Programs \(Overview\)](#)

[section 5.11: Diploma Program \(Undergraduate\) \(Overview\)](#)

[section 5.12: Diploma in Collegial Studies \(Overview\)](#)

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## **5.1 Internship Opportunities**

Internships allow students to gain practical, hands-on experience and develop skill sets that are frequently in high demand by employers. Internships involve a work placement where you are exposed to the main areas of operation of your employer. Each work placement is unique, and you benefit from a program developed exclusively for you by your employer and your instructor.

### **5.1.1 FAES 200 / FAES 300 Internship Program**

As a full-time undergraduate student (with a CGPA of 2.7 or higher) in the Faculty of Agricultural and Environmental Sciences, you have the opportunity to participate in the Internship program.

The internship should be a minimum length of 14 weeks, with the student w

- Agricultural Economics \*
- Agro-en

- Bio-Environmental Engineering Stream
- Bio-process Engineering Stream
- Bio-production Engineering Stream
- Professional Agrology Option

Refer to [section 6.3: Bachelor of Engineering \(Bioresource\) – B.Eng.\(Bioresource\)](#) for a full list of B.Eng.(Bioresource) programs and streams offered.

Students who specialize in the **Bio-Environmental Engineering** stream will learn to be responsible stewards of the environment and natural resources. This stream includes the study of soil and water quality management and conservation, organic waste treatment, urban and rural ecology, sustainability engineering, biodiversity preservation, climate change adaptation, and many other related topics.

In the **Bio-process Engineering**

**Freshman Adviser**

Professor Alice Cherestes  
Macdonald-Stewart Building, Room 1-023  
Telephone: 514-398-7980

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**5.7 Concurrent Bachelor of Science in Food Science – B.Sc.(F.Sc.) and Bachelor of Science in Nutritional Sciences – B.Sc.(Nutr.Sc.) (Overview)**

Please refer to [section 6.4.4: About the Concurrent B.Sc.\(F.Sc.\) and B.Sc.\(Nutr.Sc.\)](#) for details.

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**5.8 Honours Programs (Overview)****Honours Programs**

- [section 6.2.1.2: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Honours Agricultural Economics \(42 credits\)](#)
- [section 6.2.1.4: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Honours Agro-Environmental Sciences \(54 credits\)](#)
- [section 6.2.1.6: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Honours Environmental Biology \(54 credits\)](#)
- [section 6.2.1.8: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Honours Global Food Security \(54 credits\)](#)
- [section 6.2.1.10: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Honours Life Sciences \(Biological and Agricultural\) \(54 credits\)](#)
- [section 6.3.2: Bachelor of Engineering \(Bioresource\) \(B.Eng.\(Bioresource\)\) - Honours Bioresource Engineering \(113 credits\)](#)
- [section 6.4.2: Bachelor of Science \(Food Science\) \(B.Sc.\(F.Sc.\)\) - Honours Food Science - Food Science Option \(90 credits\)](#)
- [section 6.4.4.2: Concurrent Bachelor of Science in Food Science \(B.Sc.\(F.Sc.\)\) and Bachelor of Science Nutritional Sciences \(B.Sc.\(Nutr.Sc.\)\) - Food Science/Nutritional Science Honours \(Concurrent\) \(122 credits\)](#)
- [: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Honours Environment \(69 credits\)](#), listed under the [McGill School of Environment](#)

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**5.9 Minor Programs (Overview)****Minor Programs**

- Agribusiness Entrepreneurship – [section 6.6.2: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor Agribusiness Entrepreneurship \(18 credits\)](#)
- Agricultural Economics – [section 6.6.3: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor Agricultural Economics \(24 credits\)](#)
- Agricultural Production – [section 6.6.4: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor Agricultural Production \(24 credits\)](#)
- Animal Biology – [section 6.6.5: Bachelor of Engineering \(Bioresource\) \(B.Eng.\(Bioresource\)\) - Minor Animal Biology \(24 credits\)](#)
- Animal Health and Disease – [section 6.6.6: Bachelor of Engineering \(Bioresource\) \(B.Eng.\(Bioresource\)\) - Minor Animal Health and Disease \(24 credits\)](#)
- Applied Ecology – [section 6.6.7: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor Applied Ecology \(24 credits\)](#)
- Ecological Agriculture – [section 6.6.8: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor Ecological Agriculture \(24 credits\)](#)
- Environmental Engineering – [section 6.6.9: Minor in Environmental Engineering](#)
- Human Nutrition – [section 6.6.10: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor Human Nutrition \(24 credits\)](#)
- International Agriculture – [section 6.6.11: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor International Agriculture \(24 credits\)](#)
- Environment – listed under [McGill School of Environment > Undergraduate > Minor in Environment > : Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) or Bachelor of Science \(B.Sc.\) - Minor Environment \(18 credits\)](#)
- Some minors of interest to FAES students can also be found at : [Minors for Non-Management Students](#) – listed under [Desautels Faculty of Management](#)



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## 5.10 Post-Baccalaureate Certificate Programs (Overview)

The Faculty offers the following post-baccalaureate certificate programs.

### Post-Baccalaureate Certificate Programs

- Ecological Agriculture
- Food Science

Please refer to [section 6.7: Post-Baccalaureate Certificate Programs](#) for program descriptions and details.

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## 5.11 Diploma Program (Undergraduate) (Overview)

### Diploma Program (Undergraduate)

- Diploma in Environment – see [McGill School of Environment > Undergraduate > Diploma in Environment > : Diploma \(Dip.\) Environment \(30 credits\)](#)

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## 5.12 Diploma in Collegial Studies (Overview)

### Diploma in Collegial Studies

- [McGill School of Environment & Earth Sciences / Undergraduate / Diploma in Collegial Studies](#)

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## 5.13 Environmental Sciences Programs (Overview)

### 5.13.1 McGill School of Environment (MSE)

The MSE is a joint initiative of the Faculty of Agricultural and Food Sciences and the Faculty of Science.

Information on these programs and related fellowships is available from the Graduate and Postdoctoral Studies office, Macdonald Campus of McGill University, 21,111 Lakeshore Road, Macdonald-Stewart Building, Sainte-Anne-de-Bellevue QC H9X 3V9.

Further information including full program lists is offered in the Faculty of Agricultural and Environmental Sciences [Graduate and Postdoctoral Studies section](#), and details regarding graduate courses, theses, registration, fellowships, etc., can be accessed at [www.mcgill.ca/gps](http://www.mcgill.ca/gps).

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## 6 Browse Academic Programs

Degree programs at the undergraduate level in the Faculty may lead to a B.Sc. degree in Agricultural and Environmental Sciences (Ag.Env.Sc.), a B.Sc. degree in Food Science (F.Sc.), a B.Sc. degree in Nutritional Sciences (Nutr.Sc.), or a B.Eng. degree in Bioresource Engineering. The Faculty also offers students the possibility of doing concurrent B.Sc. degrees in both Food Science and Nutritional Sciences.

The McGill School of Environment also offers several B.Sc.(Ag.Env.Sc.) programs; for more information, please visit the [McGill School of Environment](#) section.

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### 6.1 Freshman Major

Program Director



\*\* Freshman students planning to choose the Agricultural Economics Major will still be required to complete 90 credits in the Major. Since AGEC 200 and AGEC 201/AGEC 231 are normally required in the U1 year of the program, students who take these courses in their freshman year will be required to substitute 6 other credits. Students should discuss suitable replacement courses with their adviser.

### **6.1.2 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Freshman Program (30 credits)**

If you are entering univ

**Required Courses - Winter (12.5 credits)**

AECH 111	(4)	General Chemistry 2
AEMA 102	(4)	Calculus 2
AEPH 114	(4)	Introductory Physics 2
AGRI 196	(.5)	Freshman Seminar 2

**Elective - Winter (3 credits)****6.1.4 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Freshman Program (30 credits)**

If you are entering university for the first time from a high school system (outside of the Quebec CEGEP system) you will be required to complete a Freshman year of at least 30 credits as listed below.

Normally, students registered in the Faculty of Agricultural and Environmental Sciences Freshman program may take a maximum of 8 credits outside the Faculty offerings to meet the requirements of the program. Permission to exceed this limit must be received from the Associate Dean (Student Affairs) prior to registration.

Students require a minimum 3.00 CGPA in order to progress into Year 1 of the Dietetics program.

Note: If you are not certain that you have adequate math and/or physics skills to commence the Freshman year, you may wish to take preparatory courses prior to the normal Fall semester. You are encouraged to discuss your potential need with your academic adviser. Mathematical skill level will be determined during the first week of classes. Your Freshman Adviser may recommend that you register for an additional weekly Pre-calculus Lab, of 1 credit, which may be applied toward the required credits of the degree program.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

**Required Courses - Fall (14.5 credits)**

AEBI 120	(3)	General Biology
AECH 110	(4)	General Chemistry 1
AEMA 101	(3)	Calculus 1
AEPH 112	(4)	Introductory Physics 1
AGRI 195	(.5)	Freshman Seminar 1

**Required Courses - Winter (15.5 credits)**

AEBI 122	(3)	Cell Biology
AEMA 102	(4)	Calculus 2
AEPH 114	(4)	Introductory Physics 2
AGRI 196	(.5)	Freshman Seminar 2
FDSC 230	(4)	Organic Chemistry

**6.1.5 Concurrent Bachelor of Science Food Science (B.Sc. (F.Sc.)) and Bachelor of Science Nutritional Sciences (B.Sc. (Nutr.Sc.)) - Freshman Program (Concurrent) (30 credits)**

These freshman requirements apply to students in the Concurrent Bachelor of Science Food Science (B.Sc. (F.Sc.)) and Bachelor of Science Nutritional Sciences (B.Sc. (Nutr.Sc.)) degree program.

If you are entering university for the first time from a high school system (outside of the Quebec CEGEP system), you will be required to complete a Freshman year of at least 30 credits as listed below.

Normally, students registered in the Faculty of Agricultural and Environmental Sciences Freshman program may take a maximum of 8 credits outside the Faculty offerings to meet the requirements of the program. Permission to exceed this limit must be received from the Associate Dean (Student Affairs) prior to registration.

Note: If you are not certain that you have adequate math and/or physics skills to commence the Freshman year, you may wish to take preparatory courses prior to the normal Fall semester. You are encouraged to discuss your potential need with your academic adviser. Mathematical skill level will be determined during the first week of classes. Your freshman adviser may recommend that you register for an additional weekly Pre-calculus Lab, of one credit, which may be applied towards the required credits of the degree program.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### Required Courses - Fall (14.5 credits)

AEBI 120	(3)	General Biology
AECH 110	(4)	General Chemistry 1
AEMA 101	(3)	Calculus 1
AEPH 112	(4)	Introductory Physics 1
AGRI 195	(.5)	Freshman Seminar 1

### Required Courses - Winter (15.5 credits)

AEBI 122	(3)	Cell Biology
AEMA 102	(4)	Calculus 2
AEPH 114	(4)	Introductory Physics 2
AGRI 196	(.5)	Freshman Seminar 2
FDSC 230	(4)	Organic Chemistry

## 6.2 Bachelor of Science (Agricultural and Environmental Sciences) – B.Sc.(Ag.Env.Sc.)

Please refer to [section 5.3: Bachelor of Science in Agricultural and Environmental Sciences – B.Sc.\(Ag.Env.Sc.\) \(Overview\)](#) for general rules and other information regarding B.Sc.(Ag.Env.Sc.) programs.

### 6.2.1 B.Sc.(Ag.Env.Sc.) Major and Honours Programs

The faculty offers the following B.Sc.(Ag.Env.Sc.) Major and Honours programs.

The McGill School of Environment also offers several B.Sc.(Ag.Env.Sc.) programs; for more information, please visit [McGill School of Environment > Undergraduate > Browse Academic Programs > : Major in Environment – B.Sc.\(Ag.Env.Sc.\) and B.Sc.](#) and [: Honours Program in Environment](#).

#### 6.2.1.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Major Agricultural Economics (42 credits)

Program Director: Professor Paul Thomassin

#### Program Prerequisites

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements", in this eCalendar for prerequisites and minimum credit requirements.

#### Required Courses (33 credits)

AGEC 200	(3)	Principles of Microeconomics
AGEC 201	(3)	Principles of Macroeconomics
AGEC 231	(3)	Economic Systems of Agriculture
AGEC 320	(3)	Intermediate Microeconomic Theory
AGEC 330	(3)	Agriculture and Food Markets
AGEC 333	(3)	Resource Economics
AGEC 425	(3)	Applied Econometrics
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
AGEC 491	(3)	Research & Methodology
ENVB 210	(3)	The Biophysical Environment

**Complementar**

ENVB 210 (3) The Biophysical Environment

### Honours Courses

Students choose either Plan A or Plan B.

#### Honours Plan A

Two 6-credit Honours research courses in the subject area of the student's major, chosen in consultation with the Program Director of the student's major and the professor who has agreed to supervise the research project.

FAES 401 (6) Honours Research Project 1

FAES 402 (6) Honours Research Project 2

#### Honours Plan B

A minimum of two 3-credit Honours courses and 6 credits in 400- or 500-level courses, from the Faculty of Agricultural and Environmental Sciences, selected in consultation with the Program Director of the student's major. The topic of the Honours research project must be on a topic related to their major and selected in consultation with the Program Director of the student's major and the professor who has agreed to supervise the research project.

FAES 405 (3) Honours Project 1

FAES 406 (3) Honours Project 2

#### Complementary Courses (9 credits)

With the approval of the Academic Adviser, one introductory course in each of the following areas:

- Accounting
- Statistics
- Written/Oral Communication

#### Specialization (21 - 24 credits)

Specializations designed to be taken with the Agricultural Economics Matio3E31eN4 Th0 1 v.l Economics the b Tf1 0 0 1 65.83ral Economics usin of0 1 382.551 Tm\*



Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements" in this eCalendar for prerequisites and minimum credit requirements.

### Required Courses (36 credits)

AEBI 210	(3)	Organisms 1
AEMA 310	(3)	Statistical Methods 1
AGEC 200	(3)	Principles of Microeconomics
AGEC 231	(3)	Economic Systems of Agriculture
AGRI 215	(3)	Agro-Ecosystems Field Course
ANSC 250	(3)	Principles of Animal Science
ENVB 210	(3)	The Biophysical Environment
ENVB 301	(3)	Meteorology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
SOIL 315	(3)	Soil Nutrient Management

### Complementary Courses (6 credits)

6 credits of complementary courses selected as follows:

One of:

PLNT 300	(3)	Cropping Systems
PLNT 302	(3)	Forage Crops and Pastures

One of:

ANSC 451	(3)	Dairy and Beef Production Management
ANSC 458	(3)	Swine and Poultry Production

### Specialization

Choose at least one specialization of 18-24 credits.

Specializations designed to be taken with the Agro-Environmental Sciences Major:

- Animal Production
- Ecological Agriculture
- Plant Production
- \*Professional Agrology
- Soil and Water Resources

\* Membership to the OAQ requires students successfully complete one of the above specializations in addition to the Professional Agrology Specialization.

### Electives

To meet the minimum credit requirement for the degree.

#### 6.2.1.4 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Agro-Environmental Sciences (54 credits)

Program Director: Professor Roger Cue

Students can use their electives to complete the Honours program. The courses credited to the Honours program must be in addition to any required or complementary courses taken to satisfy the requirements of the student's Major and Specialization.

In addition to satisfying the Honour requirements, students must apply for the Honours program in March or April of their U2 year. It is the responsibility of the student to find a professor who is willing to support and supervise the research project. No student will be accepted into the program until a supervisor has agreed to supervise the student. Applicants must have a minimum CGPA of 3.3 to enter the Honours program and they must earn a B grade (3.0) or higher in the courses making up the Honours program. Students are required to achieve a minimum overall CGPA of 3.3 at graduation to obtain honours. The Honours program consists of 12 credits of courses that follow one of two plans listed below.

Students who meet all the requirements will have the name of their program changed to include the word "Honours."

A brief description of the Honours project activities involved will be documented and signed by the Program Director of the student's Major, the supervisor of the Honours project, and the student.

This Major is focused on the idea that agricultural landscapes are managed ecosystems, and that humans engaged in agriculture must maintain the highest possible environmental standards while providing food and other bioproducts to the marketplace. The Major core focuses on the basic and applied biology of cultivated plants, domestic animals, arable soils, and the economics of agriculture. Students then choose one or two specializations in these or connected disciplines that reflect their interests and career goals.

The program has a strong field component that includes hands-on laboratories, visits to agricultural enterprises, and opportunities for internships. Classes and laboratories exploit the unique setting and facilities of the Macdonald Campus and Farm, which is a fully functioning farm in an urban setting that exemplifies many of the issues at the forefront of modern agricultural production. Graduates of this program are eligible to become members of the Ordre des agronomes du Québec (O

Two 6-credit Honours research courses in the subject area of the student's major, chosen in consultation with the Program Director of the student's Major and the professor who has agreed to supervise the research project.

FAES 401	(6)	Honours Research Project 1
FAES 402	(6)	Honours Research Project 2

### **Honours Plan B**

A minimum of two 3-credit Honours project courses and 6 credits in 400- or 500-level courses, from the Faculty of Agricultural and Environmental Sciences, selected in consultation with the Program Director of the student's Major. The topic of the Honours project must be related to their Major and selected in consultation with the Program Director of the student's Major and the professor who has agreed to supervise the project.

FAES 405	(3)	Honours Project 1
FAES 406	(3)	Honours Project 2

### **Specialization**

Choose at least one specialization of 18-24 credits.

Specializations designed to be taken with the Agro-Environmental Sciences Major:

- Animal Production
- Ecological Agriculture
- Plant Production
- Professional Agrology\*
- Soil and Water Resources

\* Membership to the OAQ requires students successfully complete one of the above specializations in addition to the Professional Agrology Specialization.

### **Electives**

To meet the minimum credit requirement for the degree.

#### **6.2.1.5 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Major Environmental Biology (42 credits)**

The Environmental Biology Major is about the biology, diversity, and ecology of a broad range of organisms, from plant and vertebrate animals to insects, fungi, and microbes. This Major places a strong emphasis on the ecosystems that species inhabit and the constraints imposed by the physical environment and by environmental change. Environmental Biology has significant field components worked into the course sets, and through this experiential learning, biological diversity, and the ways that species interact with their physical environment in a variety of ecosystems will be studied. The Major makes full use of the unique physical setting and faculty expertise of McGill's Macdonald campus to train students to become ecologists, taxonomists, field biologists, and ecosystem scientists.

Program Director: Professor Joann Whalen

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### **Program Prerequisites**

Please refer to "F ws.3 0 0 0 1 67.52 249.783 T13 Tm(or inl seRm(aculty e)Tj1 0 1 67.52 24gul speci" > "Mmeet thC minimRm credit rs",ch couthroC483 darequir03 T

LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology

### Complementary Courses (6 credits)

6 credits of complementary courses selected from:

ENTO 330	(3)	Insect Biology
ENVB 301	(3)	Meteorology
ENVB 313	(3)	Phylogeny and Biogeography
ENVB 437	(3)	Assessing Environmental Impact
ENVB 497	(3)	Research Project 1
ENVB 498	(3)	Research Project 2
FAES 300	(3)	Internship 2
MICR 331	(3)	Microbial Ecology
PLNT 304	(3)	Biology of Fungi
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
WILD 302	(3)	Fish Ecology
WILD 307	(3)	Natural History of Vertebrates
WOOD 441	(3)	Integrated Forest Management

### Specialization

At least one specialization of 18-24 credits.

Specializations designed to be taken with the Environmental Biology Major:

- Applied Ecology
- Plant Biology
- Wildlife Biology

Note: For a complete list of specializations offered for students in the Bachelor of Science in Agricultural and Environmental Sciences, refer to "Browse Academic Units & Programs" > "Bachelor of Science (Agricultural and Environmental Sciences) - B.Sc.(Ag.Env.Sc.)" > "Specializations", in this eCalendar. Consult the Academic Adviser for approval of specializations other than those listed above.

### Electives

To meet the minimum credit requirement for the degree.

#### 6.2.1.6 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Environmental Biology (54 credits)

Program Director: Professor Joann Whalen

Students can use their electives to complete the Honours program. The courses credited to the Honours program must be in addition to any required or complementary courses taken to satisfy the requirements of the student's Major and Specialization.

In addition to satisfying the Honours requirements, students must apply for the Honours program in March or April of their U2 year. It is the responsibility of the student to find a professor who is willing to support and supervise the research project. No student will be accepted into the program until a supervisor has agreed to supervise the student. Applicants must have a minimum CGPA of 3.3 to enter the Honours program and they must earn a B grade (3.0) or higher in the courses making up the Honours program. Students are required to achieve a minimum overall CGPA of 3.3 at graduation to obtain honours.

The Honours program consists of 12 credits of courses that follow one of two plans listed below.

Students who meet all the requirements will have the name of their program changed to include the word "Honours."

A brief description of the Honours project activities: 622 qA br041 Tw1 0 0 1 67.52 70.803 gp6.803 gp6.8L1 T Tw1 the Honours req47rour1 01 423.888 1Tj1 0 0 1 399P

The Environmental Biology Major is about the biology, diversity, and ecology of a broad range of organisms, from plant and vertebrate animals to insects, fungi, and microbes. This Major places a strong emphasis on the ecosystems that species inhabit and the constraints imposed by the physical environment and by environmental change. Environmental Biology has significant field components worked into the course sets, and through this experiential learning, biological diversity, and the ways that species interact with their physical environment in a variety of ecosystems will be studied. The Major makes full use of the unique physical setting and faculty e



ANSC 250	(3)	Principles of Animal Science
ENVB 210	(3)	The Biophysical Environment
INTD 200	(3)	Introduction to International Development
NUTR 207	(3)	Nutrition and Health
NUTR 341	(3)	Global Food Security

**Complementary Courses (9 credits)**

Or



## Specialization (24 credits)

Students must also complete at least one Specialization of 24 credits.

### 6.2.1.9 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Major Life Sciences (Biological and Agricultural) (42 credits)

The Life Sciences (Biological and Agricultural) Major provides a strong foundation in the basic biological sciences. It will prepare graduates for careers in the agricultural, environmental, health, and biotechnological fields. Graduates with high academic achievement may go on to postgraduate studies in research, or professional programs in the biological, veterinary, medical, and health sciences fields.

Program Director: Professor Jacqueline Bede

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

## Program Prerequisites

Please refer to "Faculty Information and Regulations" > "Minimum Credit Requirements", in this eCalendar for prerequisites and minimum credit requirements.

Default Specialization: Students who do not select a Specialization will automatically be assigned to the Life Sciences (Multidisciplinary) Specialization upon entering U2.

## Required Courses (33 credits)

\* Other appropriate Statistics courses may be approved as substitutes by the Program Director.

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2
AEBI 212	(3)	Evolution and Phylogeny
AEHM 205	(3)	Science Literacy
AEMA 310*	(3)	Statistical Methods 1
ANSC 400	(3)	Eukaryotic Cells and Viruses
LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
PARA 438	(3)	Immunology

## Complementary Courses (9 credits)

9 credits of the complementary courses selected from:

ANSC 234	(3)	Biochemistry 2
ANSC 250	(3)	Principles of Animal Science
ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 420	(3)	Animal Biotechnology
BINF 511	(3)	Bioinformatics for Genomics
BTEC 306	(3)	Experiments in Biotechnology
ENVB 210	(3)	The Biophysical Environment
ENVB 222	(3)	St. Lawrence Ecosystems
FAES 300	(3)	Internship 2
LSCI 451	(3)	Research Project 1

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LSCI 452	(3)	Research Project 2
MICR 331	(3)	Microbial Ecology
MICR 338	(3)	Bacterial Molecular Genetics
MICR 341	(3)	Mechanisms of Pathogenicity
MICR 450	(3)	Environmental Microbiology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
PLNT 304	(3)	Biology of Fungi
PLNT 353	(3)	Plant Structure and Function
PLNT 426	(3)	Plant Ecophysiology
PLNT 435	(3)	Plant Breeding
WILD 424	(3)	Parasitology

### Specialization

At least one specialization of 18-24 credits from:

Specializations designed to be taken with the Life Sciences (Biological and Agricultural) Major:

- Animal Biology
- Animal Health and Disease
- Life Sciences (Multidisciplinary)
- Microbiology and Molecular Biotechnology

Note: For a complete list of specializations offered for students in the Bachelor of Science in Agricultural and Environmental Sciences, please refer to "Browse Academic Units & Programs" > "Bachelor of Science (Agricultural and Environmental Sciences) - B.Sc.(Ag.Env.Sc.)" > "Specializations" in this eCalendar.

### Electives

To meet the minimum credit requirement for the degree.

#### 6.2.1.10 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Life Sciences (Biological and Agricultural) (54 credits)

Students must apply for the Honours program in March or April of their U2 year. It is the responsibility of the student to find a professor who is willing to support and supervise the research project. No student will be accepted into the program until a supervisor has agreed to supervise the student. Applicants must have a minimum CGPA of 3.3 to enter the Honours program and they must earn a B grade (3.0) or higher in the courses making up the Honours program. Students are required to achieve a minimum overall CGPA of 3.3 at graduation to obtain Honours.

Students who meet all the requirements will have the name of their program changed to include the word "Honours."

A brief description of the Honours project activities involved will be documented and signed by the Program Director of the student's Major, the supervisor of the Honours project, and the student.

The Life Sciences (Biological and Agricultural) Major provides a strong foundation in the basic biological sciences. It will prepare graduates for careers in the agricultural, environmental, health, and biotechnological fields. Graduates with high academic achievement may go on to postgraduate studies in research, or professional programs in the biological, veterinary, medical, and health sciences fields.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### Program Prerequisites

Please refer to "Faculty Information and Regulations" > "Minimum Credit Requirements" in this eCalendar for prerequisites and minimum credit requirements.

### Required Courses (45 credits)

\* Other appropriate Statistics courses may be approved as substitutes by the Program Director.

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2
AEBI 212	(3)	Evolution and Phylogeny

AEHM 205	(3)	Science Literacy
AEMA 310*	(3)	Statistical Methods 1
ANSC 400	(3)	Eukaryotic Cells and Viruses
FAES 401	(6)	Honours Research Project 1
FAES 402	(6)	Honours Research Project 2
LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
PARA 438	(3)	Immunology

### Complementary Courses (9 credits)

9 credits of the complementary courses selected from:

ANSC 234	(3)	Biochemistry 2
ANSC 250	(3)	Principles of Animal Science
ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 420	(3)	Animal Biotechnology
BINF 511	(3)	Bioinformatics for Genomics
BTEC 306	(3)	Experiments in Biotechnology
ENVB 210	(3)	The Biophysical Environment
ENVB 222	(3)	St. Lawrence Ecosystems
LSCI 451	(3)	Research Project 1
LSCI 452	(3)	Research Project 2
MICR 331	(3)	Microbial Ecology
MICR 338	(3)	Bacterial Molecular Genetics
MICR 341	(3)	Mechanisms of Pathogenicity
MICR 450	(3)	Environmental Microbiology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
PLNT 304	(3)	Biology of Fungi
PLNT 353	(3)	Plant Structure and Function
PLNT 426	(3)	Plant Ecophysiology
PLNT 435	(3)	Plant Breeding
WILD 424	(3)	Parasitology

### Specialization

At least one specialization of 18-24 credits from:

Specializations designed to be taken with the Life Sciences (Biological and Agricultural) Major:

- Animal Biology
- Animal Health and Disease

- Life Sciences (Multidisciplinary)

- Microbiology and Molecular Biotechnology

Note: For a complete list of specializations offered for students in the Bachelor of Science in Agricultural and Environmental Sciences, please refer to "Browse Academic Units & Programs" > "Bachelor of Science (Agricultural and Environmental Sciences) - B.Sc.(Ag.Env.Sc.)" > "Specializations" in this eCalendar.

ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 420	(3)	Animal Biotechnology
PARA 438	(3)	Immunology

**Complementary Courses (9 credits)**

9 credits selected from:

ANSC 234	(3)	Biochemistry 2
ANSC 251	(3)	Comparative Anatomy
ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 424	(3)	Metabolic Endocrinology
ANSC 433	(3)	Animal Nutrition and Metabolism
ANSC 560	(3)	Biology of Lactation
ANSC 565	(3)	Applied Information Systems
LSCI 451	(3)	Research Project 1

**6.2.2.3 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Animal Health and Disease (24 credits)**

This specialization is offered for students wishing to understand general animal physiology and function; the susceptibility of animals to various diseases; methods for limiting and controlling potential outbreaks; and the resulting implications for the animal, the consumer and the environment. It is an ideal choice for students interested in the care of animals, or in working in laboratories where diseases are being researched.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

**Required Courses (18 credits)**

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 350	(3)	Food-Borne Pathogens
ANSC 424	(3)	Metabolic Endocrinology
MICR 341	(3)	Mechanisms of Pathogenicity
WILD 424	(3)	Parasitology

**Complementary Courses (6 credits)**

6 credits of complementary courses selected from:

ANSC 234	(3)	Biochemistry 2
ANSC 251	(3)	Comparative Anatomy
ANSC 303	(2)	Farm Livestock Internship
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 433	(3)	Animal Nutrition and Metabolism
FAES 371	(1)	Special Topics 01

**6.2.2.4 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Animal Production (24 credits)**

This specialization will be of interest to students who wish to study the improved efficiency of livestock production at the national and international levels. Students are exposed to animal nutrition, physiology, and breeding in a context that respects environmental concerns and animal-welfare issues. When taken in conjunction with the Major Agro-Environmental Sciences and the specialization in Professional Agriculture, it conforms with the eligibility requirements of the Ordre des agronomes du Québec.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### **Required Courses (24 credits)**

ANSC 234	(3)	Biochemistry 2
ANSC 301	(3)	Principles of Animal Breeding
ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 433	(3)	Animal Nutrition and Metabolism
ANSC 451	(3)	Dairy and Beef Production Management
ANSC 458	(3)	Swine and Poultry Production

### **6.2.2.5 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Applied Ecology (24 credits)**

Food, water, air, the materials we use, and much of the diversity of life and recreation we enjoy are products of ecological systems. We manage ecosystems to provide these services and our use and misuse often degrades the ability ecosystems to provide the benefits and services we value. In the Applied Ecology minor you will develop your ability to understand how ecosystems function. You will apply systems thinking to the challenge of managing ecosystems for agriculture, forestry, fisheries, protected areas and urban development. Concepts and tools will be presented that help you to deal with the complexity that an ecosystem perspective brings. The goal of this minor is to provide students with an opportunity to further develop their understanding of the ecosystem processes, ecology, and systems thinking necessary to understand, design and manage our interaction with the environment.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### **Required Courses (12 credits)**

ENVB 305	(3)	Population & Community Ecology
ENVB 415	(3)	Ecosystem Management
ENVB 437	(3)	Assessing Environmental Impact
ENVB 529	(3)	GIS for Natural Resource Management

### **Complementary Courses (12 credits)**

12 credits selected from the following:

AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 435	(3)	Soil and Water Quality Management
BREE 327	(3)	Bio-Environmental Engineering
ENTO 440	(3)	Insect Diversity
ENVB 301	(3)	Meteorology
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVB 506	(3)	Quantitative Methods: Ecology
MICR 331	(3)	Microbial Ecology







PLNT 300

(3)

Cropping Systems

**Option B**

15 credits from any of the McGill Field Study Semesters

African Field Study Semester

Barbados Field Study Semester

Barbados Interdisciplinary Tropical Studies Field Semester

Panama Field Study Semester

3 credits from the list in Option A

**6.2.2.9 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Life Sciences (Multidisciplinary) (24 credits)**

Students taking this specialization have a wide variety of Life Sciences course offerings to choose from, which allow them to target their program to their own interests in the field. Course choices are balanced between "fundamentals" and "applications." Depending upon the courses chosen, the resulting program may be relatively specialized or very broad, spanning several disciplines. Such a broad background in Life Sciences will open up employment opportunities

FDSC 442	(3)	Food Microbiology
MICR 331	(3)	Microbial Ecology
MICR 338	(3)	Bacterial Molecular Genetics
MICR 341	(3)	Mechanisms of Pathogenicity
MICR 450	(3)	Environmental Microbiology
NUTR 337	(3)	Nutrition Through Life
NUTR 512	(3)	Herbs, Foods and Phytochemicals
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation
PLNT 304	(3)	Biology of Fungi
PLNT 305	(3)	Plant Pathology
PLNT 310	(3)	Plant Propagation
PLNT 353	(3)	Plant Structure and Function
PLNT 358	(3)	Flowering Plant Diversity
PLNT 426	(3)	Plant Ecophysiology
PLNT 434	(3)	Weed Biology and Control
PLNT 435	(3)	Plant Breeding
PLNT 460	(3)	Plant Ecology
WILD 424	(3)	Parasitology

#### **6.2.2.10 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Microbiology and Molecular Biotechnology (24 credits)**

Students following this specialization receive education and training in fundamental principles and applied aspects of microbiology. Complementary courses allow students to focus on basic microbial sciences or applied areas such as biotechnology. Successful graduates may work in university, government and industrial research laboratories, in the pharmaceutical, fermentation and food industries, and with an appropriate CGPA proceed to post-graduate studies or professional biomedical schools.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

#### **Required Courses (18 credits)**

BTEC 306	(3)	Experiments in Biotechnology
MICR 331	(3)	Microbial Ecology
MICR 338	(3)	Bacterial Molecular Genetics
MICR 341	(3)	Mechanisms of Pathogenicity
MICR 450	(3)	Environmental Microbiology
WILD 424	(3)	Parasitology

#### **Complementary Courses and Suggested Electives (6 credits)**

ANSC 350	(3)	Food-Borne Pathogens
ANSC 420	(3)	Animal Biotechnology
BINF 511	(3)	Bioinformatics for Genomics
BTEC 501	(3)	Bioinformatics
BTEC 435	(3)	Functional Genomics in Mod01

(3)

MIMM 324

(3)

Fundamental Virology

Biology of Fungi 725.56MIMM 324

ENTO 352	(3)	Biocontrol of Pest Insects
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits
PLNT 312	(3)	Urban Horticulture
PLNT 322	(3)	Greenhouse Management
SOIL 535	(3)	Ecological Soil Management

### **6.2.2.13 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Professional Agrology (21 credits)**

This Specialization is required for students who wish to qualify for membership in the Ordre des agronomes du Québec (OAQ). It cannot be taken alone; it must be taken with the Major Agro-Environmental Sciences and a Second specialization in Animal Production, Ecological Agriculture, Plant Production, or Soil and Water Resources, or with the Major Agricultural Economics and the Agri-business Specialization.

Note: Most students will require 21 credits to complete this specialization. Students taking the Agri-business Specialization will need to take an additional 3 credits, chosen in consultation with the Academic Adviser, such that they meet the minimum requirements of the OAQ. The credits within this specialization may not count towards the student's Major or other Specialization. All of the 21 or 24 credits count only for this Specialization.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

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PLNT 300	(3)	Cropping Systems
PLNT 302	(3)	Forage Crops and Pastures
PLNT 434	(3)	Weed Biology and Control

#### 6.2.2.14 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Soil and Water Resources (24 credits)

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

This specialization will interest students who want to understand how soils and water interact within managed ecosystems such as urban or agricultural landscapes. The conservation and management of agricultural soils, issues affecting watershed management and decision making, and the remediation of contaminated soils will be examined. When taken with the Agro-Environmental Sciences Major and the specialization in Professional Agrology, this specialization conforms with the eligibility requirements for the Ordre des agronomes du Québec.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

##### Required Courses (15 credits)

AGRI 435	(3)	Soil and Water Quality Management
BREE 217	(3)	Hydrology and Water Resources
SOIL 326	(3)	Soils in a Changing Environment
SOIL 331	(3)	Environmental Soil Physics
SOIL 535	(3)	Ecological Soil Management

##### Complementary Courses (9 credits)

\* Note: Students may take BREE 529 or ENVB 529, but not both.

BREE 322	(3)	Organic Waste Management
BREE 327	(3)	Bio-Environmental Engineering
BREE 510*	(3)	Watershed Systems Management
BREE 529*	(3)	GIS for Natural Resource Management
ENVB 529*	(3)	GIS for Natural Resource Management
NRSC 333	(3)	Pollution and Bioremediation
SOIL 300	(3)	Geosystems
SOIL 510	(3)	Environmental Soil Chemistry

#### 6.2.2.15 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Wildlife Biology (24 credits)

This specialization focuses on the ecology of vertebrate animals, their biological and physical environment, and the interactions that are important in the management of ecological communities and wildlife species. Students have access to local wildlife resources including the Avian Science and Conservation Centre, the McGill Arboretum, the Stonycroft Wildlife Area, the Molson Reserve, and the Ecomuseum.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

##### Required Courses (16 credits)

ENVB 529	(3)	GIS for Natural Resource Management
WILD 307	(3)	Natural History of Vertebrates
WILD 350	(3)	Mammalogy
WILD 401	(4)	Fisheries and Wildlife Management
WILD 420	(3)	Ornithology

##### Complementary Courses (8 credits)

Note: A 2-credit course may replace one of the complementary courses with permission of the advisor.

BIOL 307	(3)	Behavioural Ecology
BIOL 427	(3)	Herpetology
ENVB 437	(3)	Assessing Environmental Impact
ENVB 506	(3)	Quantitative Methods: Ecology
PLNT 358	(3)	Flowering Plant Diversity
WILD 302	(3)	Fish Ecology
WILD 421	(3)	Wildlife Conservation
WILD 424	(3)	Parasitology
WILD 475	(3)	Desert Ecology

### 6.3 Bachelor of Engineering (Bioresource) – B.Eng.(Bioresource)

For more information on this major, please see [section 5.4: Bachelor of Engineering in Bioresource Engineering – B.Eng.\(Bioresource\) \(Overview\)](#).

#### 6.3.1 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Major Bioresource Engineering (113 credits)

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

##### Required Courses (56 credits)

AEMA 202	(3)	Intermediate Calculus
AEMA 305	(3)	Differential Equations
BREE 205	(3)	Engineering Design 1
BREE 210	(3)	Mechanical Analysis & Design
BREE 216	(3)	Bioresource Engineering Materials
BREE 252	(3)	Computing for Engineers
BREE 301	(3)	Biothermodynamics
BREE 305	(3)	Fluid Mechanics
BREE 319	(3)	Engineering Mathematics
BREE 327	(3)	Bio-Environmental Engineering
BREE 341	(3)	Mechanics of Materials
BREE 420	(3)	Engineering for Sustainability
BREE 451	(1)	Undergraduate Seminar 1 - Oral Presentation
BREE 452	(1)	Undergraduate Seminar 2 Poster Presentation
BREE 453	(1)	Undergraduate Seminar 3 - Scientific Writing
BREE 485	(1)	Senior Undergraduate Seminar 1
BREE 490	(3)	Engineering Design 2
BREE 495	(3)	Engineering Design 3
ECSE 461	(3)	Electric Machinery
FACC 250	(0)	Responsibilities of the Professional Engineer
FACC 300	(3)	Engineering Economy
FACC 400	(1)	Engineering Professional Practice
MECH 289	(3)	Design Graphics

##### Complementary Courses (57 credits)

57 credits of the complementary courses selected as follow:

6 credits - Set A

9 credits - Set B (Natural Sciences and Mathematics)

9 credits - Set C (Social Sciences)

33 credits - Set D (Engineering)

#### Set A

3 credits from the following:

AEMA 310	(3)	Statistical Methods 1
CIVE 302	(3)	Probabilistic Systems

3 credits from the following:

CHEE 315	(3)	Heat and Mass Transfer
MECH 346	(3)	Heat Transfer

#### Set B - Natural Sciences and Mathematics

9 credits with a minimum of 3 credits chosen from the list below:

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2
ENVB 305	(3)	Population & Community Ecology
ENVB 315	(3)	Science of Inland Waters
LSCI 202	(3)	Molecular Cell Biology
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology

With 6 credits chosen in consultation with the Academic Adviser.

#### Set C - Social Sciences

Minimum of 3 credits from the following list:

ENVR 201	(3)	Society, Environment and Sustainability
SOCI 235	(3)	Technology and Society

Plus 6 credits of Social Sciences, Management Studies, Humanities, or Law courses at the U1 undergraduate level or higher with approval of the Academic Adviser.

Note: these 6 credits may include one 3-credit language course other than the student's normal spoken languages.

#### Set D - Engineering

33 credits from the following list where 15 credits must be taken from 200-400 level courses, with the option (and approval of the Academic Adviser) of taking a maximum of 6 credits from other courses offered in the Faculty of Engineering:

BREE 214	(3)	Geomatics
BREE 217	(3)	Hydrology and Water Resources
BREE 314	(3)	Agri-Food Buildings
BREE 315	(3)	Design of Machines
BREE 322	(3)	Organic Waste Management
BREE 325	(3)	Food Process Engineering

BREE 329	(3)	Precision Agriculture
BREE 412	(3)	Machinery Systems Engineering
BREE 416	(3)	Engineering for Land Development
BREE 418	(3)	Soil Mechanics and Foundations
BREE 423	(3)	Biological Material Properties
BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 504	(3)	Instrumentation and Control
BREE 509	(3)	Hydrologic Systems and Modelling
BREE 510	(3)	Watershed Systems Management
BREE 515	(3)	Soil Hydrologic Modelling
BREE 518	(3)	Ecological Engineering
BREE 519	(3)	Advanced Food Engineering

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BREE 327	(3)	Bio-Environmental Engineering
BREE 341	(3)	Mechanics of Materials
BREE 420	(3)	Engineering for Sustainability
BREE 451	(1)	Undergraduate Seminar 1 - Oral Presentation
BREE 452	(1)	Undergraduate Seminar 2 Poster Presentation
BREE 453	(1)	Undergraduate Seminar 3 - Scientific Writing
BREE 485	(1)	Senior Undergraduate Seminar 1
BREE 490	(3)	Engineering Design 2
BREE 495	(3)	Engineering Design 3
ECSE 461	(3)	Electric Machinery
FACC 250	(0)	Responsibilities of the Professional Engineer
FACC 300	(3)	Engineering Economy
FACC 400	(1)	Engineering Professional Practice
MECH 289	(3)	Design Graphics

### Complementary Courses (57 credits)

57 credits of the complementary courses selected as follows:

#### Honours Courses

Students choose either Plan A or Plan B

#### Honours Plan A

12 credits of Honours research courses in the subject area of the student's major in consultation with the Program Director of the student's major and the professor who has agreed to supervise the research project.

12 credits from:

FAES 401	(6)	Honours Research Project 1
FAES 402	(6)	Honours Research Project 2

OR

#### Honours Plan B

A minimum of 6 credits of Honours courses and 6 credits in 500-level BREE courses, selected in consultation with the Program Director of the student's major. The topic of the Honours research project must be on a topic related to their major and selected in consultation with the program Director of the student's major and the professor who has agreed to supervise the research project.

6 credits from:

FAES 405	(3)	Honours Project 1
FAES 406	(3)	Honours Project 2

Plus 6 credits of BREE courses at the 500 level.

6 credits - Set A

#### Set A

3 credits from the following:

AEMA 310	(3)	Statistical Methods 1
CIVE 302	(3)	Probabilistic Systems

3 credits from the following:

CHEE 315	(3)	Heat and Mass Transfer
MECH 346	(3)	Heat Transfer

9 credits - Set B (Natural Sciences and Mathematics)

**Set B - Natural Sciences and Mathematics**

9 credits with a minimum of 3 credits chosen from the list below:

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2
ENVB 305	(3)	Population & Community Ecology
ENVB 315	(3)	Science of Inland Waters
LSCI 202	(3)	Molecular Cell Biology
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology

Plus 6 credits chosen in consultation with the Academic Adviser.

9 credits - Set C (Social Sciences)

**Set C - Social Sciences**

Minimum of 3 credits from the following list:

ENVR 201	(3)	Society, Environment and Sustainability
SOCI 235	(3)	Technology and Society

Plus 6 credits of social sciences, management studies, humanities, or law courses at the U1 undergraduate level or higher with approval of the Academic Adviser. Note: these 6 credits may include one 3-credit language course other than the student's normal spoken languages.

21 credits - Set D (Engineering)

**Set D - Engineering**

21 credits from the following list where 15 credits must be taken from 200-400 level courses, with the option (and approval of the Academic Adviser) of taking a maximum of 6 credits from other courses offered in the Faculty of Engineering:

BREE 214	(3)	Geomatics
BREE 217	(3)	Hydrology and Water Resources
BREE 314	(3)	Agri-Food Buildings
BREE 315	(3)	Design of Machines
BREE 322	(3)	Organic Waste Management
BREE 325	(3)	Food Process Engineering
BREE 329	(3)	Precision Agriculture
BREE 412	(3)	Machinery Systems Engineering
BREE 416	(3)	Engineering for Land Development
BREE 418	(3)	Soil Mechanics and Foundations
BREE 423	(3)	Biological Material Properties

BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 504	(3)	Instrumentation and Control
BREE 509	(3)	Hydrologic Systems and Modelling
BREE 510	(3)	Watershed Systems Management
BREE 515	(3)	Soil Hydrologic Modelling
BREE 518	(3)	Ecological Engineering
BREE 519	(3)	Advanced Food Engineering
BREE 520	(3)	Food, Fibre and Fuel Elements
BREE 522	(3)	Bio-Based Polymers
BREE 529	(3)	GIS for Natural Resource Management
BREE 530	(3)	Fermentation Engineering
BREE 531	(3)	Post-Harvest Drying
BREE 532	(3)	Post-Harvest Storage
BREE 533	(3)	Water Quality Management
BREE 535	(3)	Food Safety Engineering

### 6.3.3 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Major Bioresource Engineering - Professional Agrology (113 credits)

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

#### Required Courses (59 credits)

AEMA 202	(3)	Intermediate Calculus
AEMA 305	(3)	Differential Equations
AGRI 330	(1)	Agricultural Legislation
AGRI 430	(2)	Professional Practice in Agrology
BREE 205	(3)	Engineering Design 1
	(3)	Mechanical Analysis & Design

FACC 250	(0)	Responsibilities of the Professional Engineer
FACC 300	(3)	Engineering Economy
FACC 400	(1)	Engineering Professional Practice
MECH 289	(3)	Design Graphics

### Complementary Courses (54 credits)

54 credits of the complementary courses selected as follows:

6 credits - Set A

12 credits - Set B (Natural Sciences)

6 credits - Set C (Social Sciences)

30 credits - Set D (Engineering)

#### Set A

6 credits

3 credits from the following:

AEMA 310	(3)	Statistical Methods 1
CIVE 302	(3)	Probabilistic Systems

3 credits from the following:

CHEE 315	(3)	Heat and Mass Transfer
MECH 346	(3)	Heat Transfer

#### Set B - Natural Sciences

6 credits from each of the following two groups:

##### Group 1 - Biology

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2
LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology

##### Group 2 - Agricultural Sciences

ANSC 250	(3)	Principles of Animal Science
ANSC 433	(3)	Animal Nutrition and Metabolism
ANSC 451	(3)	Dairy and Beef Production Management
ANSC 458	(3)	Swine and Poultry Production
PLNT 300	(3)	Cropping Systems
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits
PLNT 312	(3)	Urban Horticulture
PLNT 322	(3)	Greenhouse Management

**Set C - Social Sciences**

3 credits from the following list:

ENVR 201	(3)	Society, Environment and Sustainability
SOCI 235	(3)	Technology and Society

**Set D - Engineering**

33 credits from Group 1, Group 2, and Group 3.

(Minimum of 6 credits from each of Group 1, Group 2 or Group 3) with the option (and approval of the Academic Adviser) of taking 6 credits from other courses offered in the Faculty of Engineering. A minimum of 15 credits must be taken from 200-400 level courses.

**Group 1 - Soil and Water**

BREE 214	(3)	Geomatics
BREE 217	(3)	Hydrology and Water Resources
BREE 322	(3)	Organic Waste Management
BREE 329	(3)	Precision Agriculture
BREE 416	(3)	Engineering for Land Development
BREE 418	(3)	Soil Mechanics and Foundations
BREE 509	(3)	Hydrologic Systems and Modelling
BREE 510	(3)	Watershed Systems Management
BREE 515	(3)	Soil Hydrologic Modelling
BREE 518	(3)	Ecological Engineering
BREE 529	(3)	GIS for Natural Resource Management
BREE 533	(3)	Water Quality Management

**Group 2 - Food Processing**

BREE 325	(3)	Food Process 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

**Group 3 - Other Engineering**

BREE 314	(3)	Agri-Food Buildings
BREE 315	(3)	Design of Machines
BREE 412	(3)	Machinery Systems Engineering
BREE 423	(3)	Biological Material Properties
BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 504	(3)	Instrumentation and Control
BREE 522	(3)	Bio-Based Polymers

## 6.3.4 Bachelor of Engineering (Bioresource) – B.Eng.(Bioresource) Related Programs

### 6.3.4.1 Minor in Environmental Engineering

For more information, see [section 6.6.9: Minor in Environmental Engineering](#).

### 6.3.4.2 Barbados Field Study Semester

For more information, see [Study Abroad & Field Studies > Undergraduate > Barbados Field Study Semester](#).

### 6.3.4.3 Internship Opportunities and Co-op Experiences

For more information, see [section 5.1: Internship Opportunities](#).

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## 6.4 Bachelor of Science (Food Science) - B.Sc.(F.Sc.)

Please refer to [section 5.5: Bachelor of Science in Food Science – B.Sc.\(F.Sc.\) \(Overview\)](#) for advising and other information on these B.Sc.(F.Sc.) programs.

### 6.4.1 Bachelor of Science (Food Science) (B.Sc.(F.Sc.)) - Major Food Science - Food Science Option (90 credits)

This program is intended for those students interested in the multidisciplinary field of food science. The courses are integrated to acquaint the student with food processing, food chemistry, quality assurance, analytical procedures, food products, standards, and regulations. The program prepares graduates for employment as scientists in industry or government, in regulatory, research, quality assurance, or product development capacities.

Graduates have the academic qualifications for membership in the Canadian Institute of Food Science and Technology (CIFST). Graduates of the Food Science Major with Food Science Option can also qualify for recognition by the Institute of Food Technologists (IFT).

The Food Science Option is completed to 90 credits with free elective courses.

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements" in this eCalendar for prerequisites and minimum credit requirements.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

#### Required Courses (51 credits)

Note: If an introductory CEGEP-level Organic Chemistry course has not been completed, then FDSC 230 (Organic Chemistry) must be completed as a replacement.

AEMA 310	(3)	Statistical Methods 1
A	(3)	Professional Practice

**Additional Required Courses - Food Science Option (21 credits)**

Physical Chemistry





For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### Required Courses (54 credits)

Note: If an introductory CEGEP-level Organic Chemistry course has not been completed, then FDSC 230 (Organic Chemistry) must be completed as a replacement.

AEMA 310	(3)	Statistical Methods 1
AGRI 510	(3)	Professional Practice
BREE 324	(3)	Elements of Food Engineering
FDSC 200	(3)	Introduction to Food Science
FDSC 213	(3)	Analytical Chemistry 1
FDSC 251	(3)	Food Chemistry 1
FDSC 300	(3)	Principles of Food Analysis 1
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
FDSC 319	(3)	Food Commodities
FDSC 330	(3)	Food Processing
FDSC 400	(3)	Food Packaging
FDSC 442	(3)	Food Microbiology
FDSC 495D1	(1.5)	Food Science Seminar
FDSC 495D2	(1.5)	Food Science Seminar
FDSC 525	(3)	Food Quality Assurance
FDSC 540	(3)	Sensory Evaluation of Foods
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health

### Additional Required Courses - Food Chemistry Option (30 credits)

Note: Graduates of this program are qualified for recognition by the Institute of Food Technologists (IFT) and the Ordre des chimistes du Québec (OCQ).

FDSC 233	(3)	Physical Chemistry
FDSC 305	(3)	Food Chemistry 2
FDSC 315	(3)	Separation Techniques in Food Analysis 1
FDSC 334	(3)	Analysis of Food Toxins and Toxicants
FDSC 405	(3)	Food Product Development
FDSC 490	(3)	Research Project 1
FDSC 491	(3)	Research Project 2
FDSC 515	(3)	Enzymology
FDSC 516	(3)	Flavour Chemistry
FDSC 520	(3)	Biophysical Chemistry of Food

### Electives (6 credits)

Electives are selected in consultation with an academic adviser, to meet the minimum 90-credit requirement for the degree. A portion of these credits should be in the humanities/social sciences.

#### 6.4.4 About the Concurrent B.Sc.(F.Sc.) and B.Sc.(Nutr.Sc.)

Unique in North America, the concurrent degree program in Food Science and Nutritional Science offers the best education in these complementary fields. It allows students to complete two degrees at once, and opens the door to a multitude of career paths.

The **Food Science** component of the program focuses on the chemistry of food and the scientific principles underlying food safety, preservation, processing, and packaging, to provide consumers with quality foods. The **Nutritional Science** component deals with the science of human nutrient metabolism and the nutritional aspects of food. The program has been carefully structured to ensure that students receive the training that the industry demands, including a stage placement in the Nutrition or Food Industry.

#### 6.4.4.1 Concurrent Bachelor of Science in Food Science (B.Sc.(F.Sc.)) and Bachelor of Science Nutritional Sciences (B.Sc.(Nutr.Sc.)) - Food Science/Nutritional Science Major (Concurrent) (122 credits)

The concurrent program B.Sc.(F.Sc.) and B.Sc.(Nutr.Sc.) is designed to give motivated students the opportunity to combine the two fields. The two disciplines complement each other with Food Science providing the scientific foundation in the fundamentals of food science and its application in the food system, while Nutritional Sciences brings the fundamental knowledge in the nutritional aspects of food and metabolism. The program aims to train students with the fundamental knowledge in both disciplines to promote the development of healthy food products for human consumption. The overall program is structured and closely integrated to satisfy the academic requirements of both degrees as well as the professional training or exposure to industry.

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements" in this publication for prerequisites and minimum credit requirements.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

#### Required Courses (80 credits)

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
FDSC 200	(3)	Introduction to Food Science
FDSC 213	(3)	Analytical Chemistry 1
FDSC 251	(3)	Food Chemistry 1
FDSC 300	(3)	Principles of Food Analysis 1
FDSC 305	(3)	Food Chemistry 2
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
FDSC 315	(3)	Separation Techniques in Food Analysis 1
FDSC 319	(3)	Food Commodities
FDSC 330	(3)	Food Processing
FDSC 334	(3)	Analysis of Food Toxins and Toxicants
FDSC 400	(3)	Food Packaging
FDSC 442	(3)	Food Microbiology
FDSC 497	(1.5)	Professional Seminar: Food
FDSC 525	(3)	Food Quality Assurance
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 307	(3)	Metabolism and Human Nutrition
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1
NUTR 497	(1.5)	Professional Seminar: Nutrition
NUTR 512	(3)	Herbs, Foods and Phytochemicals

#### Complementary Courses (30 credits)

Complementary courses are selected as follows:

At least 9 credits from the following:

AGEC 200	(3)	Principles of Microeconomics
AGEC 201	(3)	Principles of Macroeconomics
AGEC 330	(3)	Agriculture and Food Markets
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
AGEC 450	(3)	Agribusiness Management
NUTR 446	(3)	Applied Human Resources

At least 9 credits from the following:

ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
ENVR 203	(3)	Knowledge, Ethics and Environment
FDSC 516	(3)	Flavour Chemistry
FDSC 535	(3)	Food Biotechnology
FDSC 536	(3)	Food Traceability
FDSC 537	(3)	Nutraceutical Chemistry
NUTR 322	(3)	Applied Sciences Communication
NUTR 341	(3)	Global Food Security
NUTR 503	(3)	Bioenergetics and the Lifespan

12 credits from the following:

FDSC 480	(12)	Food Industry Internship
NUTR 480	(12)	Nutrition Industry Internship

### Elective Courses (12 credits)

Electives are selected in consultation with an academic adviser.

\* Not all courses may be offered every year, please consult with your adviser when planning your program.

#### 6.4.4.2 Concurrent Bachelor of Science in Food Science (B.Sc.(F.Sc.)) and Bachelor of Science Nutritional Sciences (B.Sc.(Nutr.Sc.)) - Food Science/Nutritional Science Honours (Concurrent) (122 credits)

Students can use their electives to complete the Honours program. The courses credited to the Honours program must be in addition to any required or complementary courses taken to satisfy the requirements of the student's major and specialization.

In addition to satisfying the research requirements, students must apply for the Honours program in March or April of their U3 year. It is the responsibility of the student to find a professor who is willing to support and supervise the research project. No student will be accepted into the program until a supervisor has agreed to supervise the student. Applicants must have a minimum CGPA of 3.3 to enter the Honours program and they must earn a B grade (3.0) or higher in the courses making up the Honours program. Students are required to achieve a minimum overall CGPA of 3.3 at graduation to obtain honours. Students can use their electives to complete the Honours program. The courses credited to the Honours program must be in addition to any required or complementary courses taken to satisfy the requirements of the student's major and specialization.

The Honours program consists of 12 credits of courses that follow one of two plans listed below.

Students who meet all the requirements will have the name of their program changed to include the word "Honours."

A brief description of the research activities involved will be documented and signed by the Program Director of the student's major, the supervisor of the research project, and the student.

The concurrent program B.Sc.(F.Sc.) and B.Sc.(Nutr.Sc.) is designed to give motivated students the opportunity to combine the two fields. The two disciplines complement each other with Food Science providing the scientific foundation in the fundamentals of food science and its application in the food system, while Nutritional Sciences brings the fundamental knowledge in the nutritional aspects of food and metabolism. The program aims to train students with the

fundamental knowledge in both disciplines to promote the development of healthy food products for human consumption. The overall program is structured and closely integrated to satisfy the academic requirements of both degrees as well as the professional training or exposure to industry.

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements" in this eCalendar for prerequisites and minimum credit requirements.

**Required Courses (80 credits)**

AEMA 310	(3)	Statistical Methods 1
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FAES 405	(3)	Honours Project 1
FAES 406	(3)	Honours Project 2

### Complementary Courses (30 credits)

Complementary courses are selected as follows:

At least 9 credits from the following:

AGEC 200	(3)	Principles of Microeconomics
AGEC 201	(3)	Principles of Macroeconomics
AGEC 330	(3)	Agriculture and Food Markets
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
AGEC 450	(3)	Agribusiness Management

At least 9 credits from the following:

AGEC 242	(3)	Management Theories and Practices
ENVR 203	(3)	Knowledge, Ethics and Environment
NRSC 340	(3)	Global Perspectives on Food
NUTR 301	(3)	Psychology
NUTR 322	(3)	Applied Sciences Communication
NUTR 446	(3)	Applied Human Resources

12 credits from the following:

FDSC 480	(12)	Food Industry Internship
NUTR 480	(12)	Nutrition Industry Internship

### Elective Courses (12 credits)

Electives are selected in consultation with an academic adviser.

## 6.4.5 Bachelor of Science (Food Science) – B.Sc.(F.Sc.) Related Programs

### 6.4.5.1 Certificate in Food Science

Detailed information on this certificate program can be found under [section 6.7.2: Certificate \(Cert.\) Food Science \(30 credits\)](#) in this publication.

## 6.5 Bachelor of Science (Nutritional Sciences) – B.Sc.(Nutr.Sc.)

Please refer to [section 5.6: Bachelor of Science in Nutritional Sciences – B.Sc.\(Nutr.Sc.\) \(Overview\)](#) for advising and other information regarding the Dietetics and Nutrition majors.

### 6.5.1 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Dietetics (115 credits)

The Major Dietetics, which includes a 40-week internship (Stage) as part of its degree requirements, is a professional program that leads to eligibility for membership in a provincial regulatory body and registration as a professional Dietitian/Nutritionist (R.D. or p.dt). Graduates are qualified for challenging professional and leadership positions related to food and health, as dietitians, nutritionists, and food administrators. The designations "Dietitian" and "Nutritionist" are reserved titles associated with reserved acts in the province of Quebec. As clinical dietitians/nutritionists, dietitians may work in healthcare settings, nutrition counselling centres, clinics, and private practice. As community nutritionists, dietitians are involved in nutrition education programs through

community health programs, school boards, and local and international health agencies. The dietitian in the food service sector participates in all aspects of management to assure quality food products and services. Postgraduate programs are available to qualified graduates. The duration of the program is 3.5 years, with the 40 weeks of supervised internship (Stage) integrated into each year in a planned sequence. Successful graduates are qualified to apply for membership with the Ordre professionnel des diététistes du Québec (O.P.D.Q.) and/or other provincial regulatory bodies, as well as Dietitians of Canada.

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements" in this publication for prerequisites and minimum credit requirements.

For information on academic advising, see: [www.mcgill.ca/macdonald/studentinfo/advising](http://www.mcgill.ca/macdonald/studentinfo/advising)

**\* Advising Notes for Professional Practice (Stage):**

The School firmly applies prerequisite requirements for registration in all required courses in the Dietetics Major.

NUTR 508*	(7)	Professional Practice Stage 4A
NUTR 509*	(7)	Professional Practice Stage 4B
NUTR 545	(4)	Clinical Nutrition 2
NUTR 546	(4)	Clinical Nutrition 3

**Revision, May 2018. End of revision.**

### **Complementary Courses (3 credits)**

3 credits (200 level or higher) in human behavior social science from the following list, or another 3-credit human behavior course approved by your adviser.

EDPE 300	(3)	Educational Psychology
NUTR 301	(3)	Psychology
PSYC 215	(3)	Social Psychology
SOCI 210	(3)	Sociological Perspectives

### **Elective Courses (3 credits)**

Students who need to improve their proficiency in either English or French are strongly encouraged to choose their electives for that purpose. Students who wish to take language courses should check with the French Language Centre, Faculty of Arts, as placement testing may be required. Students are encouraged to develop a working knowledge of French in order to optimize their participation and learning in Stage placement sites. Similar to the language policy for Medicine, a functional working knowledge of French is expected by second year. Alternate elective choices may include, but are not limited to:

AEHM 300	(3)	ESL: High Intermediate 1
AEHM 301	(3)	ESL: High Intermediate 2
AEHM 330	(3)	Academic and Scientific Writing
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 512	(3)	Herbs, Foods and Phytochemicals

### **A Compulsory Immunization**

A compulsory immunization program exists at McGill which is required for Dietetics students to practise. Students should complete their immunization before or soon after arriving at Macdonald campus; confirmation of immunization will be coordinated by the Health nurse through Student Services (<http://www.mcgill.ca/studenthealth/>). Certain deadlines may apply.

## **6.5.2 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Food Function and Safety (90 credits)**

This Major offers a core emphasis on the scientific fundamentals of nutrition and metabolism throughout the lifespan from the molecular to the organismal level. The concentration in food function and safety covers the ranges from health effects of phytochemicals and food toxicants, food chemistry and analysis, food safety, product development and influence of constituents of food on health. This degree does not lead to professional licensure as a Dietitian/Nutritionist. Graduates are qualified for careers in the biotechnology field, pharmaceutical and/or food industries, government laboratories, and the health science communications field. Graduates often continue on to graduate studies preparing for careers in research, medicine, and dentistry or as specialists in nutrition.

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements", in this eCalendar for prerequisites and minimum credit requirements.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### **Required Courses (60 credits)**

All required courses must be passed with a minimum grade of C.

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1

FDSC 300	(3)	Principles of Food Analysis 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1



FDSC 516	(3)	Flavour Chemistry
FDSC 520	(3)	Biophysical Chemistry of Food
FDSC 525	(3)	Food Quality Assurance
FDSC 535	(3)	Food Biotechnology
FDSC 537	(3)	Nutraceutical Chemistry
FDSC 540	(3)	Sensory Evaluation of Foods
NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1
NUTR 551	(3)	Analysis of Nutrition Data

### Elective Courses (15 credits)

15 credits of electives are taken to meet the minimum credit requirement for the degree. Reciprocal agreement allows all students to take a limited number of electives at any Quebec university. With prior approval students can take electives at any Canadian or international university.

### 6.5.3 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Global Nutrition (90 credits)

This Major covers many aspects of human nutrition and food and their impact on health and society at the community and international level. It offers a core emphasis on the scientific fundamentals of nutrition and metabolism throughout the lifespan. The specialization in global nutrition emphasizes the importance of the interaction of nutrition, diet, water, environment, and infection. This degree does not lead to professional licensure as a Dietitian/Nutritionist. Graduates are qualified for careers in national and international governmental and non-governmental food and health agencies, in world development programs, in the food sector, and the health science communications field. Graduates often continue on to graduate studies preparing for careers in public health, epidemiology, research, medicine, and dentistry or as specialists in nutrition.

Please refer to "Faculty Informa(ater)Tjg. or as specialists in nut Tc5Informa(ater)Tc(ater)Tjg. gulen con" > "Mfor theC can tj1 0 0 1 12t anc475.4es eCaleghorTj1 emi7.981

**Complementary Courses (15 credits)**

15 credits of complementary courses are selected as follows:

### Elective Courses (15 credits)

15 credits of Electives are taken to meet the minimum credit requirement for the degree. Reciprocal agreement allows all students to take a limited number of electives at any Quebec university. With prior approval students can take electives at any Canadian or international university.

### 6.5.4 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Health and Disease (90 credits)

This Major offers a core emphasis on the scientific fundamentals of nutrition and metabolism throughout the lifespan. This concentration emphasizes the influence of diet and nutrition on human health and the pathophysiology of chronic disease. This degree does not lead to professional licensure as a dietitian/nutritionist. Graduates are qualified for careers in health research, pharmaceutical and/or food industries, government laboratories, and the health science communications field. Graduates often continue on to graduate studies preparing for careers in research, medicine, and dentistry or as specialists in nutrition.

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements", in this eCalendar for prerequisites and minimum credit requirements.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### Required Courses (60 credits)

All required courses must be passed with a minimum grade of C.

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 307	(3)	Metabolism and Human Nutrition
NUTR 322	(3)	Applied Sciences Communication

Nutrition Through Life322.463 Tm((3))Tjp024y22 3m1o.o.60 0 1 2322fi0 lease (90 credits)

FDSC 537	(3)	Nutraceutical Chemistry
FDSC 545	(3)	Advances in Food Microbiology
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 511	(3)	Nutrition and Behaviour
NUTR 545	(4)	Clinical Nutrition 2
NUTR 546	(4)	Clinical Nutrition 3
NUTR 551	(3)	Analysis of Nutrition Data

At least 9 credits from the following courses:

ANAT 214	(3)	Systemic Human Anatomy
ANAT 261	(4)	Introduction to Dynamic Histology
ANSC 312	(3)	Animal Health and Disease
ANSC 560	(3)	Biology of Lactation
MICR 341	(3)	Mechanisms of Pathogenicity
MIMM 414	(3)	Advanced Immunology
NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1
NUTR 551	(3)	Analysis of Nutrition Data
PATH 300	(3)	Human Disease
PHAR 300	(3)	Drug Action
PHAR 301	(3)	Drugs and Disease
PHAR 303	(3)	Principles of Toxicology
PHGY 311	(3)	Channels, Synapses and Hormones
PHGY 312	(3)	Respiratory, Renal, & Cardiovascular Physiology
PHGY 313	(3)	Blood, Gastrointestinal, & Immune Systems Physiology
WILD 424	(3)	Parasitology

### Elective Courses (15 credits)

15 credits of electives are taken to meet the minimum credit requirement for the degree. A reciprocal agreement allows all students to take a limited number of electives at any Quebec university. With prior approval students can take electives at any Canadian or international university.

### 6.5.5 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Nutritional Biochemistry (90 credits)

This Major offers a core emphasis on the scientific fundamentals of nutrition and metabolism throughout the lifespan from the molecular to the organismal level. This concentration in nutritional biochemistry links nutrigenomics, nutrigenetics, and biotechnology with human health, regulation of metabolism, and the pathophysiology of inherited and chronic disease. This degree does not lead to professional licensure as a dietitian/nutritionist. Graduates are qualified for careers in the biotechnology field, pharmaceutical and/or food industries, government laboratories, and the health science communications field. Graduates often continue on to graduate studies preparing for careers in research, medicine, and dentistry or as specialists in nutrition.

Refer to "Faculty Information and Regulations" > "Minimum Credit Requirements," in this eCalendar for prerequisites and minimum credit requirements.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

### Required Courses (60 credits)

All required courses must be passed with a minimum grade of C.

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2

ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
BTEC 306	(3)	Experiments in Biotechnology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 307	(3)	Metabolism and Human Nutrition
NUTR 322	(3)	Applied Sciences Communication
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1
NUTR 401	(1)	Emerging Issues in Nutrition
NUTR 450	(3)	Research Methods: Human Nutrition
NUTR 512	(3)	Herbs, Foods and Phytochemicals

### Complementary Courses (15 credits)

15 credits of complementary courses are selected as follows:

#### Common Complementary Courses

At least 6 credits from the following:

ANSC 433	(3)	Animal Nutrition and Metabolism
ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
ANSC 560	(3)	Biology of Lactation
FDSC 537	(3)	Nutraceutical Chemistry
FDSC 545	(3)	Advances in Food Microbiology
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 511	(3)	Nutrition and Behaviour
NUTR 545	(4)	Clinical Nutrition 2
NUTR 546	(4)	Clinical Nutrition 3
NUTR 551	(3)	Analysis of Nutrition Data
PARA 438	(3)	Immunology

At least 9 credits from the following courses:

ANAT 262	(3)	Introductory Molecular and Cell Biology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 420	(3)	Animal Biotechnology

ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
BINF 301	(3)	Introduction to Bioinformatics
BIOC 312	(3)	Biochemistry of Macromolecules
BIOL 300	(3)	Molecular Biology of the Gene
BTEC 535	(3)	Functional Genomics in Model Organisms

NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1
NUTR 401	(1)	Emerging Issues in Nutrition Research Methods: Human Nutrition

15 credits of electives are tak



\* Note: To be counted towards the Minor in Agribusiness Entrepreneurship, the placement in FAES 300 must be approved by the program coordinator as having entrepreneurial focus.

### **6.6.3 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Minor Agricultural Economics (24 credits)**

The Minor in Agricultural Economics will complement a student's education in four ways. First, as a social science, Economics will provide an alternativ

- a) ensure that their academic record at the University includes a C grade or higher in the courses as specified in the course requirements given below.
- b) offer a minimum total of 24 credits from the courses as given below, of which not more than 6 credits may be counted for both the Major and the Minor programs. This restriction does not apply to elective courses in the Major program.

**Required Cour**

### 6.6.6 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Minor Animal Health and Disease (24 credits)

The Minor in Animal Health and Disease is offered to students wishing to understand general animal physiology and function, the susceptibility of animals to various diseases, methods for limiting and controlling potential outbreaks, and the resulting implications for the animal, the consumer, and the environment. It is an ideal choice for students who are interested in the care of animals, or in working in laboratories where diseases are being researched. It would also be useful to students who wish to apply to most veterinary colleges in North America.

This Minor is not open to students in B.Sc.(Ag.Env.Sc.) programs. These students may register for the specialization in Animal Health and Disease.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

#### Required Courses (18 credits)

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 350	(3)	Food-Borne Pathogens
ANSC 424	(3)	Metabolic Endocrinology
MICR 341	(3)	Mechanisms of Pathogenicity
PARA 438	(3)	Immunology

#### Complementary Courses (6 credits)

6 credits selected from the following list:

ANSC 234	(3)	Biochemistry 2
ANSC 251	(3)	Comparative Anatomy
ANSC 303	(2)	Farm Livestock Internship
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 433	(3)	Animal Nutrition and Metabolism

### 6.6.7 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Minor Applied Ecology (24 credits)

Food, water, air, the materials we use, and much of the diversity of life and recreation we enjoy are products of ecological systems. We manage ecosystems to provide these services and our use and misuse often degrades the ability of ecosystems to provide the benefits and services we value. In the Minor Applied

AGRI 435	(3)	Soil and Water Quality Management
ENTO 440	(3)	Insect Diversity
ENVB 301	(3)	Meteorology
ENVB 506	(3)	Quantitative Methods: Ecology
MICR 331	(3)	Microbial Ecology
MICR 450	(3)	Environmental Microbiology
PLNT 304	(3)	Biology of Fungi
PLNT 426	(3)	Plant Ecophysiology
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
SOIL 326	(3)	Soils in a Changing Environment
OIL 38ems	(3)	Fish Ecology

MICR 331	(3)	Microbial Ecology
NUTR 341	(3)	Global Food Security
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits
PLNT 312	(3)	Urban Horticulture
PLNT 434	(3)	Weed Biology and Control
PLNT 460	(3)	Plant Ecology
WOOD 441	(3)	Integrated Forest Management

### 6.6.9 Minor in Environmental Engineering

The Minor program consists of 21 credits in courses that are environment related. By means of a judicious choice of complementary courses, Bioresource Engineering students may obtain this Minor with a minimum of 12 additional credits.

The Environmental Engineering Minor is administered by the Faculty of Engineering, Department of Civil Engineering and Applied Mechanics (see [Faculty of Engineering](#) > Undergraduate > Browse Academic Units & Programs > Minor Programs > : [Bachelor of Engineering \(B.Eng.\) - Minor Environmental Engineering \(21 credits\)](#)).

**Courses available in the F**

3 credits in Physiology, one of:

ANSC 323	(3)	Mammalian Physiology
PHGY 210	(3)	Mammalian Physiology 2

3 credits in Nutrition, one of:

ANSC 433	(3)	Animal Nutrition and Metabolism
NUTR 307	(3)	Metabolism and Human Nutrition

**Revision, May 2018. Start of revision.**

3 credits from:

ANSC 551	(3)	Carbohydrate and Lipid Metabolism
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Students select 18 credits from either Option A or Option B

### Option A

18 credits from the following:

AGEC 333	(3)	Resource Economics
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 325	(3)	Sustainable Agriculture and Food Security
AGRI 499	(3)	Agricultural Development Internship
BREE 510	(3)	Watershed Systems Management
ENVB 437	(3)	Assessing Environmental Impact
FDSC 525	(3)	Food Quality Assurance
NUTR 501	(3)	Nutrition in Developing Countries
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation
PLNT 300	(3)	Cropping Systems

### Option B

15 credits from any of the McGill Field Study Semesters:

African Field Study Semester

Barbados Field Study Semester

Barbados Interdisciplinary Tropical Studies Field Semester

Panama Field Study Semester

Plus 3 credits from the list in Option A

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## 6.7 Post-Baccalaureate Certificate Programs

The Faculty offers the following 30-credit post-baccalaureate certificate programs.

### 6.7.1 Certificate (Cert.) Ecological Agriculture (30 credits)

This 30-credit certificate program is very similar to the Minor program and is designed to focus on the principles underlying the practice of ecological agriculture. The certificate may be of special interest to professional agrologists who want further training, as well as formal recognition that they have completed a coherent program of courses beyond their B.Sc. studies.

Students holding a B.Sc. in agriculture or a related area are eligible to register for this program provided that they are otherwise acceptable for admission to the University. Students who have completed the Minor or specialization in Ecological Agriculture are not permitted to register for this program.

For information on academic advising, see: <http://www.mcgill.ca/macdonald/studentinfo/advising>

#### General Regulations

To obtain a certificate in Ecological Agriculture, students must complete a minimum total of 30 credits from the courses as given below.

#### Notes:

1. Most courses listed at the 300 level and higher have prerequisites. Although instructors may waive prerequisite(s) in some cases, students are urged to prepare their program of study to ensure that they have met all conditions.
2. Students using AGRI 310 to e pr 1 o

AGEC 430	(3)	Agriculture, Food and Resource Policy
AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture
SOIL 535	(3)	Ecological Soil Management

**Complementary Courses (18 credits)**

18 credits chosen from the following, in consultation with the Academic Adviser for Ecological Agriculture.

AGRI 310	(3)	Internship in Agriculture/Environment
AGRI 411	(3)	Global Issues on Development, Food and Agriculture Soil and W



FDSC 315	(3)	Separation Techniques in Food Analysis I
FDSC 319	(3)	Food Commodities
FDSC 330	(3)	Food Processing
FDSC 400	(3)	Food Packaging
FDSC 405	(3)	Food Product Development
FDSC 442	(3)	Food Microbiology
FDSC 495D1	(1.5)	Food Science Seminar
FDSC 495D2	(1.5)	Food Science Seminar
FDSC 515	(3)	Enzymology
FDSC 516	(3)	Flavour Chemistry
FDSC 519	(3)	Advanced Food Processing
FDSC 520	(3)	Biophysical Chemistry of Food
FDSC 525	(3)	Food Quality Assurance
FDSC 535	(3)	Food Biotechnology
FDSC 536	(3)	Food Traceability
FDSC 537	(3)	Nutraceutical Chemistry
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health

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## 6.8 Field Studies

### 6.8.1 Africa Field Study Semester

The Department of Geography, Faculty of Science, coordinates the 15-credit interdisciplinary Africa Field Study Semester. For more information, see [Study Abroad & Field Studies > Undergraduate > : Africa Field Study Semester](#).

### 6.8.2 Barbados Field Study Semester

This program takes place at Bellairs Research Institute in Barbados; it is a full 15-credit program offered each Fall semester. For more information, see [Study Abroad & Field Studies > Undergraduate > : Barbados Field Study Semester](#).

**Barbados Interdisciplinary Trop5m(op5m(op5m(op5m(1 460.351 350.881 Tm(.Nos 31op5- 2994.8dCI 230)Tj1 0 .544 261.24.02)Tj86lor**

- *section 7.1: Department of Animal Science*
- *section 7.2: Department of Bioresource Engineering*
- *section 7.3: Farm Management and Technology Program*
- *section 7.4: Department of Food Science and Agricultural Chemistry*
-



**Graduate Program Director**

G.S. Vijaya Raghavan

**Associate Graduate Program Director**

Chair

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## 7.3 Farm Management and Technology Program

### 7.3.1 Location

Farm Management and Technology Program  
Faculty of Agricultural and Environmental Sciences  
Macdonald Campus of McGill University  
21,111 Lakeshore Road, Harrison House  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Telephone: 514-398-7814  
Fax: 514-398-7955  
Email: [fmt.macdonald@mcgill.ca](mailto:fmt.macdonald@mcgill.ca)  
Website: [www.mcgill.ca/fmt](http://www.mcgill.ca/fmt)

### 7.3.2 About the Farm Management and Technology Program

The Farm Management and Technology (FMT) program is a 3-year academic and practical college program, offered on the Macdonald Campus and taught by the staff of the Faculty of Agricultural and Environmental Sciences of McGill University. For further information on the program, please refer to our [website](#).

### 7.3.3 Diploma of College Studies — Farm Management Technology

This three-year academic and practical program is offered on the Macdonald campus and taught by the staff of the Faculty of Agricultural and Environmental Sciences of McGill University. The program is funded by the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec and authorized by the Ministère de l'Éducation, Enseignement supérieur, et Recherche (MEESR).

The educational goals of the program are:

1. to make our graduates competent in the exercise of their profession;
2. to help the student's integration into professional life;
3. to foster professional mobility;
4. to foster a need for continual development of professional knowledge.

#### Program Overview

Six academic terms are spent on the Macdonald Campus studying a sequence of courses in soil, plant science, animal science, engineering, and management. The first summer of the program includes a 13-week internship on an agricultural enterprise other than the home farm, or an agricultural business, where the student learns the many skills related to modern commercial agriculture. Students prepare for their



**Winter 3**

FMT4 023	(1.33)	Building Management (152-VSZ-MC)
FMT4 024	(1.67)	Farm Building Development (152-VTA-MC)
FMT4 025	(2.33)	Enterprise Management 3 (152-VTB-MC)
FMT4 026	(1.67)	Human Resources (152-VTC-MC)
FMT4 027	(1.33)	Precision Agriculture (152-VTD-MC)

#### 7.3.4 Farm Management and Technology Program Faculty

##### Director

Peter Enright; B.Sc.(Agr.Eng.), M.Sc.(McG.)

##### Associate Director



**Note:** The University reserves the right to make changes without prior notice to the information contained in this publication, including the alteration of various fees, schedules, conditions of admission and credit requirements, and the revision or cancellation of particular courses. In normal circumstances, indi

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**7.4 Department of Food Science and Agricultural Chemistry****7.4.1 Location**

Macdonald-Stewart Building, Room MS1-034  
McGill University, Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Canada  
T

**Adjunct Professors**

John

- Nutritional Biochemistry
- Sports Nutrition

**M.Sc.A., M.Sc., and Ph.D.**

Graduate degrees in Human Nutrition are also offered in thesis- and non-thesis-based research at the master's level and thesis-based research at the doctoral level. Three options are available in the M.Sc. Applied de

### Sessional Lecturers

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

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

Michele Iskandar: B.Sc.(Nutr.), M.Sc.(Nutr.)(Amer. U. Beirut), Ph.D.(McG.)

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

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

### Associate Members

*Anaesthesia:* Franco Carli, Ralph Lattermann, Thomas Schricker

*Food Science & Agricultural Chemistry:* Stephane Bayen

*Kinesiology:* Ross Andersen

*Medicine:* Louis Beaumier, L. John Hoffer, Larry Lands, Errol B. Marliss, José Morais, Jean-François Yale

*Natural Resource Sciences:* Sebastien Faucher

*Parasitology:* Marilyn E. Scott

### Adjunct Professor

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

## 7.5.5 Application Procedures

The academic year at McGill is made up of two sessions: the Fall/Winter (regular) session and the Summer session. These are subdivided into the Fall term (September to December), the Winter term (January to April) and the four months of the Summer session (May, June, July, and August). While most students enter in September, it is possible to be considered for admission to most of the Agricultural and Environmental Studies undergraduate programs in January. Entry at the Freshman Program level or to the Dietetics Major, however, are not available in January.

The deadlines for submission of applications are:

- Applicants studying outside of Canada: **January 15**
- Applicants from Canadian high schools outside of Quebec: **February 1**
- All other applicants: **March 1**

All applications must be accompanied by a non-refundable fee, in Canadian or U.S. funds only, payable by certified cheque, money order or credit card. McGill does not offer application fee waivers. Please refer to for fee amounts and other fee information.

Application to the School of Human Nutrition may be made online at [www.mcgill.ca/applying](http://www.mcgill.ca/applying). Information may also be obtained from:

Service Point  
McGill University, Enrolment Services  
3415 McTavish St.  
Montreal QC H3A 0C8  
Canada  
Telephone: 514-398-7878  
Fax: 514-398-4193  
Website: [www.mcgill.ca/students/servicepoint](http://www.mcgill.ca/students/servicepoint)

Please note that the same application is used for all undergraduate programs at McGill, and two program choices can be entered.

## 7.5.6 Admission Requirements

Applicants to the **School of Human Nutrition** are not required to submit proof of proficiency in English if they meet one of the following conditions:

- their mother tongue/first language is English;
- they have completed both Secondary V and a Diploma of Collegial Studies in Quebec;
- they have completed the last five years of study in a French Baccalaurate International Option program, or in a French Lycée located in an English speaking country;
- they have completed A-Level English (other than English as a Second Language) with a final grade of C or better;
- their last five years of study (preceding application) have been at a learning institution where English is the main language of instruction (includingy in Engl Kst fi

More information on language requirements is available at [University Regulations and Resources](#) > [Undergraduate](#) > [General Policies and Information](#) > [Language Policy](#).

#### **7.5.6.1 Quebec CEGEP Students**

Applicants must have completed a two-year Quebec post-secondary collegial program (CEGEP) in the Pure and Applied Sciences, Health Sciences, or Science de la nature. (Applicants who have completed the *DEC en sciences, lettres et arts* are also eligible for admission. Applicants who have completed a DEC in a technical area will be considered on an individual basis.)

McGill uses the *cote de rendement au collégial* (*cote r*) rather than CEGEP percentage grades for admission decisions. The *cote r* is a method of comparing and ranking students from CEGEP; it measures how far above or below the class av

Consideration will be given to the results for Grade 11 and 12 level courses (regardless of the calendar year in which they were taken), with emphasis on grades obtained in courses most relevant to the intended program of study. Generally speaking, all marks are taken into consideration in determining admission, including those of failed or repeated courses.

If the applicant comes from a school where the language of instruction is English, then Grade 12 English must be included in the academic record. If the applicant comes from a school where the language of instruction is French, then Grade 12 French is required. English and French Second Language courses are not accepted as prerequisites.

#### **7.5.6.4 Applicants from U.S. High School Programs**

Applicants who are applying on the basis of a high school diploma from a school in the United States must have completed a pre-calculus course in functions, and at least two of biology, chemistry, and physics. Applicants must write College Entrance Examination Board tests including the SAT I and three SAT IIs. SAT IIs must include mathematics and at least one science. ACTs are also acceptable.

Applicants who have completed Advanced Placement Examinations in appropriate subjects with a grade of 4 or better will be granted some advanced standing, up to a maximum of 30 credits.

Students who are accepted on the basis of a high school diploma enter a program which is extended by one year to include the 30 credits which comprise the **Freshman Year** (see [section 6.1.4: Bachelor of Science \(Nutritional Sciences\) \(B.Sc.\(Nutr.Sc.\)\) - Freshman Program \(30 credits\)](#)).



**Note:** Admission to the freshman year is available for the Nutrition major only, not the Dietetics major. Students who wish to enter Year 1 of the Dietetics major, and who first need to complete a freshman year, may complete the freshman year in the Nutrition Major, and then apply for transfer to year 1 of the Dietetics Major. Entry to Year 1 of the Dietetics major is based on CGPA.

#### **7.5.6.5 Applicants from Other Countries**

The normal basis for review of a file is completion of the credentials which lead to university admission in the applicant's country of study.

Students from the United Kingdom and Commonwealth countries may be admitted if they have completed Advanced Level examinations in chemistry, physics, and mathematics with two Bs and one C or better in each, and five appropriate G.C.S.E. subjects at the Ordinary Level, including biology and English.

Advanced Level examination results which are appropriate to the intended program of studies will be assessed for advanced standing and credit when the results are received directly from the appropriate Examination Board. A maximum of 30 credits is granted for Advanced Lev

#### **7.5.6.8 Transfer Students – Inter-Faculty**

Students wishing to transfer from one faculty to another must complete an inter-faculty transfer form. The deadline for submitting a transfer form for admission to the School is **June 1** for admission in September and **December 1** for admission in January. There are no Winter term transfers for the Dietetics major.

For CGPA requirements please see [www.mcgill.ca/macdonald/studentinfo/under](http://www.mcgill.ca/macdonald/studentinfo/under)



Canada  
Telephone: 514-398-7773  
Fax: 514-398-7990  
Email: [info.macdonald@mcgill.ca](mailto:info.macdonald@mcgill.ca)  
Website: [www.mcgill.ca/nrs](http://www.mcgill.ca/nrs)

### 7.6.2 About the Department of Natural Resource Sciences

As humans depend on a wide variety of ecosystem services, society is becoming increasingly aware of the need for sustainable management of natural resources. We require the natural world to provide us with necessities such as air, water, food, and energy, but also depend on ecosystems for services such as nutrient cycling, biodiversity, recreation, and the splendor of nature. Sustainable management of natural resources via governance of human activities requires an understanding of all of these elements.

The Department of Natural Resource Sciences is a multidisciplinary group with a wide range of interests, including wildlife and fish biology, entomology, agriculture, soil science, microbiology, genomics, meteorology, forest science, landscape ecology, agricultural and resource economics, and environmental policy. We are concerned with the populations and diversity of organisms within ecosystems; the flow of energy and nutrients through ecosystems; and processes that influence human behavior toward ecosystem services and the environment. Our graduate programs in agricultural economics, entomology, microbiology, and renewable resources, allow students to gain disciplinary depth and interdisciplinary breadth.

Natural Resource Sciences plays a strong role in several undergraduate programs, from the inter-departmental **Majors** in:

- Environmental Biology;
- Life Sciences (Biological and Agricultural);
- Environment (McGill School of Environment);
- Agro-Environmental Sciences; and
- Agricultural Economics;

to the **Specializations** such as:

- Applied Ecology;
- Wildlife Biology;
- Microbiology and Molecular Biotechnology;
- Agribusiness; and
- Environmental Economics.

### 7.6.3 Natural Resource Sciences Faculty

Chair

## Professors

Joann Whalen; B.Sc.(Agr.)(Dal.), M.Sc.(McG.), Ph.D.(Ohio St.) – *Soil Science (William Dawson Scholar)*

Lyle G. Whyte; B.Sc.(Regina), Ph.D.(Wat.) – *Microbiology*

## Associate Professors

Niladri Basu; B.Sc.(Qu.), M.Sc.(Br. Col.), Ph.D.(McG.) (*Canada Research Chair*) (joint appt. with *School of Human Nutrition*) – *Ecotoxicology*

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

Christopher Buddle; B.Sc.(Guelph), Ph.D.(Alta.) – *Forest Insect Ecology*

Jeffrey Cardille; B.Sc.(Carn. Mell), M.Sc.(Georgia Tech.), M.Sc., Ph.D.(Wisc.) (joint appt. with *McGill School of Environment*) – *Landscape Ecology*

Benôit Côté; B.Sc., Ph.D.(Laval) – *Forest Resources*

Brian T. Driscoll; B.Sc., Ph.D.(McM.) – *Microbiology*

Gary B. Dunphy; B.Sc.(New Br.), M.Sc., Ph.D.(Nfld.) – *Entomology*

Sebastien Faucher; B.Sc., Ph.D.(Montr) – *Microbiology*

Gordon Hickey; B.Sc.(Melb.), Ph.D.(Br. Col.), EMPA(ANZSOG, Monash) – *Sustainable Natural Resource Management (William Dawson Scholar)*

Murray Humphries; B.Sc.(Manit.), M.Sc.(Alta.), Ph.D.(McG.) – *Wildlife Biology (Northern Research Chair)*

McGill University, Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Canada  
Telephone: 514-398-7722  
Fax: 514-398-7857  
Email: [graduate.parasitology@mcgill.ca](mailto:graduate.parasitology@mcgill.ca)  
Website: [www.mcgill.ca/parasitology](http://www.mcgill.ca/parasitology)

### 7.7.2 About the Institute of Parasitology

The Institute of Parasitology is one of the oldest recognized centres of interdisciplinary research in Canada. We focus on parasitic organisms, the relationship with their host, and the means to limit the impact of parasitic disease on health and wellbeing.

For more information, please visit the Institute of Parasitology [website](#).

### 7.7.3 Parasitology Faculty

#### Director

Timothy G. Geary

#### Professors

Timothy G. Geary; B.Sc.(Notre Dame), Ph.D.(Mich.) (*Canada Research Chair in Parasite Biotechnology*)

Roger Prichard; B.Sc., Ph.D.(NSW) (*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.)

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

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

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

#### Assistant Professors

Jerry Aldridge; B.Sc.(Lenoir-Rhyne), Ph.D.(Wake Forest)

Jianguo Xia; B.Sc.(Peking), M.Sc., Ph.D.(Alta.) (*Canada Research Chair in Bioinformatics and Big Data Analytics*)

#### Associate Members

Gregory J. Matlashewski; B.Sc.(C'odia), Ph.D.(Ott.)

Momar Ndao; B.Sc., DVM(Dakar), M.Sc., Ph.D.(IMFA, Belgium)

Martin Olivier; B.Sc., M.Sc.(Montr.), Ph.D.(McG.)

Mary Stevenson; B.A.(Hood Coll.), M.Sc., Ph.D.(CUA)

Brian Ward; M.Sc.(Oxf.), M.D.,C.M.(McG.), DTM&H(Lond.)

#### Adjunct Professors

Boakye Boatın; M.D.(Ghana), M.Sc.(Liv.), M.Phil.(Lond.)

Sean Forrester; B.Sc.(Cape Breton), M.Sc.(Lake.), Ph.D.(McG.)

Tatiana Scorza Dagert; B.Sc.(Los Andes, Venezuela), M.Sc., Ph.D.(Vrije, Belgium)

Traian Sulea; M.Sc.(Polytechnic, Timi oara), Ph.D.(West, Timi oara)

Karine Thivierge; B.Sc.(Laval), M.Sc., Ph.D.(McG.)

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## 7.8 Department of Plant Science

### 7.8.1 Location

Raymond Building, Room R2-019  
McGill University, Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Canada  
Telephone: 514-398-7773  
Fax: 514-398-8732  
Email: [plant.science@mcgill.ca](mailto:plant.science@mcgill.ca)  
Website: [www.mcgill.ca/plant](http://www.mcgill.ca/plant)

### 7.8.2 About the Department of Plant Science

Our understanding of biological systems has advanced exponentially during the twenty-first century, and technological developments now allow us to pose questions that simply could not be asked a few decades ago. We also live in a time of great challenges: the human population is now over 7 billion and continues to rise at an alarming rate; the climate is changing; worldwide energy availability is decreasing; quality freshwater is becoming scarce; biodiversity is disappearing; and a number of wild habitats are threatened by human activities.

How can we keep feeding the growing population with quality food while resources are scarcer than ever? How will plants react to a changing climate? How can we design effective conservation strategies to preserve biodiversity? Plant scientists have a crucial role to play in solving these problems, and using the knowledge accumulated in the field of biology to answer these questions.

The Department of Plant Science contributes to several undergraduate programs that will train tomorrow's agrologists, ecologists, botanists, and biotechnologists. These include **Specializations** in Ecological Agriculture, Plant Biology, Plant Production, as well as the Environmetrics and Food Production and Environment

### Assistant Professors

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

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

### 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

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## 8 Instructional Staff

### Instructional Staff

Adamchuk, Viacheslav I.; B.S.(National Agricultural Univ., Ukraine), M.S., Ph.D.(Purd.); Associate Professor, Bioresource Engineering

Adamowski, Jan; B.Eng.(RMC), M.Phil.(Camb./MIT), M.B.A.(Warsaw/HEC Paris/London Business School/NHH), Ph.D.(Warsaw); Associate Professor, Bioresource Engineering (*William Dawson Scholar*)

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

Akbarzadeh Shafaroud, Abdolhamid; Ph.D.(New Br.), M.Sc.(Amirkabir Univ. of Tech., Tehran), B.Sc.(Isfahan Univ. of Tech.);

## Instructional Staff

Driscoll, Brian T.; B.Sc., Ph.D.(McM.); Associate Professor, Microbiology and Chair, Department of Natural Resource Sciences

Duggavathi, Rajesha; B.V.Sc., M.V.Sc.(Univ. of Agricultural Sciences, Bangalore), Ph.D.(Sask.); Associate Professor, Animal Science

Duhamel, Paul-Guy; B.Sc.(McG.), M.Sc.(Montr.), Faculty Lecturer (Professional), Human Nutrition

Dumont, Marie-Josée; B.Eng., M.Eng.(Laval), Ph.D.(Alta.); Assistant Professor, Bioresource Engineering

Dunphy, Gary B.; B.Sc.(New Br.), M.Sc., Ph.D.(Nfld.); Associate Professor, Entomology

Dutilleul, Pierre R.; B.Sc., Ph.D.(Louvain); Professor, Statistics

Elliott, Kyle H.; B.Sc.(Hons.)(Br. Col.), M.Sc., Ph.D.(Manit.); Assistant Professor, Avian Conservation Biology (*Canada Research Chair*)

Enright, Peter; B.Sc.(Agr.Eng.), M.Sc.(McG.); Faculty Lecturer and Director, Farm Management and Technology Program

Faucher, Sébastien P.; B.Sc., M.Sc., Ph.D.(Montr.); Associate Professor, Microbiology

Freeman, Julia; B.A.(S. Fraser), M.A.(McG.), Ph.D.(Br. Col.); Faculty Lecturer, McGill School of Environment

Fyles, James W.; B.Sc., M.Sc.(Vic., BC), Ph.D.(Alta.); Associate Dean (Student Affairs) and Professor, Woodland Resources (*Tomlinson Chair in Forest Ecology*)

Geary, Timothy G.; B.Sc.(Notre Dame), Ph.D.(Mich.); Professor, Parasitology and Director, Institute of Parasitology (*Canada Research Chair in Parasite Biotechnology*)

Geitmann, Anja; Diplom(Konstanz), Ph.D.(Siena); Dean, Faculty of Agricultural and Environmental Sciences, and Associate Vice-Principal (Macdonald Campus) (*Canada Research Chair in Biomechanics of Plant Development*)

George, Saji; B.Sc., M.Sc.(Mahatma Gandhi, Kottayam), Ph.D.(NUS); Associate Professor, Food Quality Assurance

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

Goodridge, Lawrence D.; B.Sc., M.Sc.(Guelph), Ph.D.(Georgia); Associate Professor, Food Microbiology/Food Safety (*Ian & Jayne Munro Chair in Food Safety*)

Gravel, Valérie; B.Sc., M.Sc., Ph.D.(Laval); Assistant Professor, Plant Science

Harou, Aurélie; B.S.(Sus.), M.Sc.(Calif., Davis), Ph.D.(Cornell); Assistant Professor, Resource Economics

Hayes, J. Flannan; B.Agr.Sc., M.Agr.Sc.(Dublin), Ph.D.(N. Carolina St.); Professor, Animal Science

Head, Jessica; B.Sc.(McG.), Ph.D.(Ott.); Assistant Professor, Natural Resource Sciences

Hendrickson-Nelson, Mary; B.A.(College of St. Benedict), B.Sc.(Minn.), M.Sc.(Colo. St.); Faculty Lecturer (Stage), Human Nutrition

Hickey, Gordon M.; B.F.Sc.(Melb.), Ph.D.(Br. Col.); Associate Professor, Natural Resource Sciences (*William Dawson Scholar*)

Humphries, Murray; B.Sc.(Manit.), Ph.D.(Alta.); Associate Professor, Wildlife Biology and Director, Centre for Indigenous Peoples' Nutrition and Environment

Ismail, Ashraf A.; B.Sc., Ph.D.(McG.); Associate Professor, Food Science and Agricultural Chemistry

Jabaji, Suha; B.Sc.(AUB), M.Sc.(Guelph), Ph.D.(Wat.); Professor, Plant Science

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

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

Kallenbach, Cynthia; B.Sc. (Sonoma), M.Sc.(Calif.), Ph.D.(N.Hamp.); Assistant Professor in Environmental Soil Biogeochemistry

Karboune, Salwa; B.Sc., M.Sc.(Institut Agronomique et Vétérinaire Hassan II), Ph.D.(Univ. de la Méditerranée); Associate Professor, Food Science and Associate Dean, Research

Kimmins, Sarah; B.Sc.(Dal.), M.Sc.(Nova Scotia Ag.), Ph.D.(Dal.); Associate Professor, Animal Science (*Canada Research Chair*)

Koski, Kristine G.; B.S., M.S.(Wash.), Ph.D.(Calif., Davis); Associate Professor, Human Nutrition

Kosoy, Nicolas; B.Sc.(Simon Bolivar, Venezuela), M.Sc.(Kent), M.Sc.(Univ. Autònoma de Barcelona), Ph.D.(Univ. of Tilburg); Associate Professor, Environmental and Ecological Economics and Environment

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