



**Faculty of Agricultural and Environmental  
Sciences, including School of Human Nutrition  
Programs, Courses and University Regulations  
2024-2025**



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

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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 Macdonald Campus Facilities**

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### **2.1 Morgan Arboretum**

The Morgan Arboretum is one of McGill's teaching and research stations. It 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

## 2.5 Brace Centre for Water Resources Management

The Brace Centre for Water Resources Management spans two faculties, the Faculty of Engineering and the Faculty of Agriculture and Environmental Sciences, whose members carry out advanced multidisciplinary research related to addressing today's complex water challenges. The centre is also a local chapter of the Quebec water research network, CentrEau. The centre's members engage in research, teaching, and specialized training, and draw on a wide range of facilities available within the University and the Montreal region. More information is available at [mcgill.ca/brace](http://mcgill.ca/brace).

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## 3 About Agricultural & Environmental Sciences (Undergraduate)

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### 3.1 Location

McGill University, Macdonald Campus  
21, 111 Lakeshore Road  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Canada  
Telephone: 514-398-7925  
Website: [mcgill.ca/macdonald](http://mcgill.ca/macdonald)

The Faculty of Agricultural and Environmental Sciences and the School of Human Nutrition are located on the Macdonald Campus of McGill University, at the western end of the island of Montreal. Served by public transport (STM [www.stm.info](http://www.stm.info), bus, and train), it is easily reached from the McGill Downtown Campus and from the Pierre Elliott Trudeau International Airport. Special arrangements can be made for prospective students to use the McGill inter-campus [shuttle bus service](#). The shuttle service is available to all registered students who attend classes on both campuses.

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### 3.2 The Faculty of Agricultural and Environmental Sciences, including School of Human Nutrition (Undergraduate)

The Faculty of Agricultural and Environmental Sciences and the School of Human Nutrition are located on McGill University's Macdonald Campus, which occupies 650 hectares in a beautiful waterfront setting on the western tip of the island of Montreal.

Students can earn internationally recognized degrees in the fields of agricultural sciences and applied biosciences, food and nutritional sciences, environmental sciences, and bioresource engineering. Students have the opportunity, in all programs, to study abroad in places such as Panama, Barbados, or Africa. Students may also have the opportunity to participate in internships.

Macdonald is a very diverse and international campus. Students are taught by outstanding professors who are among the top in their fields. The campus has excellent facilities for teaching and research, including well-equipped laboratories, experimental farm and field facilities, and the Morgan Arboretum. The campus is surrounded by the Ottawa and St. Lawrence rivers.

The Faculty is at the forefront of advances in the basic sciences and engineering associated with food supply, human health and nutrition, and the environment; and it is a world leader in plant and animal biotechnology, bioproducts and bioprocessing, bioinformatics, food safety and food quality, environmental engineering, water management, soils, parasitology, microbiology, and ecosystem science and management.

The Macdonald Campus is an exciting place to live, work, study, learn, and discover. Its very intimate collegial and residential setting allows for strong interaction between staff and students, and for enriched student activity and participation in extracurricular activities. A hallmark of our undergraduate programs is the ability to provide hands-on learning experiences in the field and labs, and the smaller class sizes.

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### 3.3 Faculty Admission Requirements

For information about admission requirements and application deadlines for this Faculty, please refer to the *Undergraduate Admissions Guide* found at [mcgill.ca/applying](http://mcgill.ca/applying).

Applications are submitted directly online at [mcgill.ca/applying](http://mcgill.ca/applying). Please note that the same application is used for all undergraduate programs at McGill and two program choices can be entered. For further information, contact:

Student Affairs Office  
Macdonald Campus of McGill University  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Telephone: 514-398-7925

Email: [studentinfo.macdonald@mcgill.ca](mailto:studentinfo.macdonald@mcgill.ca)

Website: [mcgill.ca/macdonald/prospective](http://mcgill.ca/macdonald/prospective)

For information about interfaculty transfers, see [University Regulations and Resources](#) > [Undergraduate](#) > [Registration](#) > [Interfaculty Transfer](#)

### 3.4.7 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 [mcgill.ca/wellness-hub/hub-clinical-services/medical-notes-and-immunization-reviews](http://mcgill.ca/wellness-hub/hub-clinical-services/medical-notes-and-immunization-reviews).

### 3.4.8 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.

For additional information, see [University Regulations and Resources > Undergraduate > Admission to Professional and Graduate Studies > : Language Requirements for Professions](#).

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## 3.5 Faculty Information and Regulations

Each student in the Faculty of Agricultural and Environmental Sciences must be aware of the Faculty Regulations as stated in this publication. While departmental and faculty advisors and staff are always available to give advice and guidance, the ultimate responsibility for completeness and correctness of your course selection and registration, for compliance with, and completion of your program and degree requirements, and for the observance of regulations and deadlines, *rests with you*. It is your responsibility to seek guidance if in any doubt; misunderstanding or misapprehension will not be accepted as cause for dispensation from any regulation, deadline, program, or degree requirement.

### 3.5.1 Minimum Credit Requirement

You must complete the minimum credit requirement for your degree as specified in your letter of admission.

Students are normally admitted to a four-year program requiring the completion of 120 credits, but Advanced Standing of up to 30 credits may be granted if you obtain satisfactory results in the Diploma of Collegial Studies, International Baccalaureate, French Baccalaureate, Advanced Levels, and Advanced Placement tests.

Normally, Quebec students who have completed the *Diplôme d'études collégiales* (DEC) or equivalent diploma are admitted to the first year of a program requiring the completion of a minimum of 90 credits, 113 credits for Bioresource Engineering, 115 credits for Dietetics, and 122 credits for the Concurrent Degrees in Food Science and Nutritional Sciences, including any missing basic science prerequisites.

Students from outside Quebec who are admitted on the basis of a high school diploma enter the Major Freshman/Foundation Year program, which comprises 30 credits (see [section 5.1: Major Freshman/Foundation Year](#) in this publication).

You will not receive credit toward your degree for any course that overlaps in content with a course successfully completed at McGill, at another university, at CEGEP, or Advanced Placement exams, Advanced Level results, International Baccalaureate Diploma, or French Baccalaureate.

Students transferring from another university must complete a minimum of 60 McGill credits in order to receive a McGill degree. A minimum of 72 McGill credits is required for the B.Eng.(Bioresource Engineering) degree.

If you are a student in the B.Sc.(Ag.Env.Sc.) and in the Diploma in Environment (AES), you must take a minimum of two-thirds of your course credits within the Faculty of Agricultural and Environmental Sciences.

### 3.5.2 Minimum Grade Requirement

You must obtain grades of C or better in any required, complementary, or Freshman/Foundation Year courses used to fulfill program requirements. You may not register in a course for which you have not passed all the prerequisite courses with a grade of C or better, except by written permission of the Departmental Chair concerned.

### 3.5.3 Academic Advisors

Upon entering the Faculty and before registering, you must consult with the [academic advisor of your program](#) for selection and scheduling of required, complementary, and elective courses. The academic advisor will normally continue to act in this capacity for the duration of your studies in the Faculty.

A Faculty advisor is also available in the Student Affairs Office to assist you with student record related matters.



### **3.5.4 Categories of Students**

#### **3.5.4.1 Full-time Students**

Full-time students in Satisfactory Standing take a minimum of 12 credits per academic term. A normal course load is considered to be 15 credits per term. The maximum number of credits allowed per academic term is 18 credits. Students who wish to be considered for Faculty in-course scholarships must be registered for 27 graded credits during the fall/winter academic year.

Students in Probationary Standing are not permitted to take more than 14 credits per term. In exceptional circumstances, the Committee on Academic Standing may give permission to attempt more.

#### **3.5.4.2 Part-time Students**

Part-time students take fewer than 12 credits per term.

### **3.5.5 Academic Standing**

You must prove that you can master the material of lectures and laboratories. Examinations are normally held at the end of each course, but other methods of evaluation may also be used. The grade assigned for a course represents your Academic Standing in all the coursework.

The following rules apply to your Academic Standing:

- 1.** When your CGPA (or TGPA in the first term of the program) falls below 2.00, your Academic Standing becomes Probationary.
- 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.**

to the standards of the university giving the course) will be recognized for the purpose of your degree, but the grades obtained will not enter into your GPA calculations.

For universities outside Quebec, it is your responsibility to ensure that the host institution sends an official transcript to the Student Affairs Office. You must submit all documents required for approval of your transfer credits with your faculty at McGill within one month of completing your exchange program or study away. If you are studying at another Quebec university on an Inter-University Transfer (IUT) agreement, the host university sends your grade(s) to McGill automatically.

For further details, consult [University Regulations and Resources > Undergraduate > Student Records > : Transfer Credits](#) and [Undergraduate > Registration > : Quebec Inter-University Transfer Agreement](#), or go to [www.bci-qc.ca](http://www.bci-qc.ca) to access the online application.

### 3.5.8 Second Academic Majors

While registered in a major in the Faculty of Agricultural and Environmental Sciences, you may pursue a second set of courses of greater scope than a minor (e.g., faculty program, major, honours program, major concentration) in either this Faculty or another faculty. Application for a second academic major must be made to the Associate Dean (Student Affairs) in the Student Affairs Office, Laird Hall, Room 106.

Following are the regulations and procedures for second academic major:

1. You must be in Satisfactory Academic Standing with a minimum CGPA of 3.00 in order to apply for a second academic major.
2. In consultation with the appropriate authority associated with each major (academic advisor, Associate Dean), you must construct a proposal showing all the courses that are to be taken to satisfy the entrance and program requirements of both the first and second academic majors.
3. A minimum of 36 credits must be unique to the Second Major (i.e., not part of the required or complementary courses taken for the First Major).
4. You must obtain prior approval for all proposed second academic majors from your academic advisor and the Student Affairs Office and from the Associate Dean, advisor, or appropriate committee of the other faculty concerned.
5. Normally, proposals for second academic majors will be initiated before completion of U1 year of the First Academic Major.
6. The academic standards applicable to each major will be respected.

#### 3.5.8.1 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 and signed to the Student Affairs Office ([saoadvisor.macdonald@mcgill.ca](mailto:saoadvisor.macdonald@mcgill.ca)). 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 advisor and complete the program change form. The program change form must be submitted to the Student Affairs Office ([saoadvisor.macdonald@mcgill.ca](mailto:saoadvisor.macdonald@mcgill.ca)). The Minor Approval form and the Program Change form are available on the Faculty website and in the Student Af



Several programs offered by the Faculty and School can 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 des diététistes-nutritionnistes du Québec (ODNQ)*, previously named *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 5.2: Bachelor of Science (Agricultural and Environmental Sciences) – B.Sc.(Ag.Env.Sc.)*

*section 5.3: Bachelor of Engineering (Bioresource) – B.Eng.(Bioresource)*

*section 5.4: Bachelor of Science (Food Science) - B.Sc.(F.Sc.)*

*section 5.5: Bachelor of Science (Nutritional Sciences) – B.Sc.(Nutr.Sc.)*

*section 4.7: Concurrent Bachelor of Science in Food Science – B.Sc.(F.Sc.) and Bachelor of Science in Nutritional Sciences – B.Sc.(Nutr.Sc.) (Overview)*

*section 4.8: Honours Programs (Overview)*

*section 4.9: Minor Programs (Overview)*

*section 4.10: Post-Baccalaureate Certificate Programs (Overview)*

*section 4.11: Diploma Program (Undergraduate) (Overview)*

*section 4.12: Diploma in Collegial Studies (Overview)*

*section 4.13: Environmental Sciences Programs (Overview)*

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## **4.1 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 employwhere you areistes ehulo

#### 4.1.4 AGRI 499 Agricultural Development Internship

**AGRI 499** is a supervised internship which provides practical experience working on agricultural issues related to international development. The internship can take many forms, including work in a developing country, for an agency that focuses on international development, or on a research project that aims at solving problems faced by developing populations. Each internship placement must be approved by the instructor.

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#### 4.2 Exchange Programs (Overview)

The Faculty of Agricultural and Environmental Sciences participates in all University-wide student exchange programs available at McGill and also has Faculty-specific exchange programs. For more information, see [Study Abroad & Field Studies > Undergraduate > : Exchange Programs](#), and [mcgill.ca/macdonald/studentinfo/undergrads/studying-away-mcgill](http://mcgill.ca/macdonald/studentinfo/undergrads/studying-away-mcgill).

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

Students register in one **major** and at least one **specialization**. They may design their own program by choosing any major, and at least one specialization (see notes below for the majors in Environment and specializations in Agricultural Economics). By choosing two different specializations, students have the option of developing their own interdisciplinary interests. They may also choose to do a minor. The multidisciplinary specialization is designed for those interested in broad training.



**Note:** Students choosing the major in Environment will select a concentration instead of a specialization.



**Note:** Specializations in the Agricultural Economics major are restricted to Agricultural Economics students.

All the required and complementary courses for the major must be completed in full. Within each specialization, at least 18 credits must be unique, i.e., they only count for that specialization and do not overlap with either the major or a second specialization. At least 12 credits must be from 400-level courses or higher.

These programs are also available as **honoursajor**

- Animal Biology, [section 5.2.2.2: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Animal Biology \(24 credits\)](#)
- Animal Health and Disease, [section 5.2.2.3: Bachelor of Science \(Agricultural and En](#)

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## 4.5 Bachelor of Science in Food Science – B.Sc.(F.Sc.) (Overview)

Refer to [section 5.4: Bachelor of Science \(Food Science\) - B.Sc.\(F.Sc.\)](#) for a full list of B.Sc.(F.Sc.) programs offered.

### Food Science

- Food Chemistry Option
- Food Science Option

The F

- : *Bac*



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## **4.13 Environmental Sciences Programs (Overview)**

### **4.13.1 Bieler School of Environment**

The Bieler School of Environment is a joint initiative of the Faculty of Agricultural and Environmental Sciences, the Faculty of Arts, and the Faculty of Science. It offers a B.Sc.(Ag.Env.Sc.) Major in Environment, a B.Sc. Major in Environment, a B.A. & Sc. Interfaculty Program in Environment, a B.A. Faculty Program in Environment, a Minor in Environment, and a Diploma in Environment. These programs allow you to choose to study on both the Macdonald and Downtown campuses.

### **4.13.2 Environmental Programs on the Macdonald Campus**

A number of integrated environmental science programs are offered on the Macdonald Campus, particularly within the B.Sc.(Ag.Env.Sc.) and B.Eng.(Bioresource) degrees. The objective of these interdepartmental programs is to provide a well-rounded training in a specific interdisciplinary subject as well as a basis for managing natural resources. F

The Foundation Year program is designed to provide a basic science foundation to students entering university for the first time from a high school system (outside of the Quebec CEGEP system). The Foundation Year program consists of at least 30 credits in fundamental mathematics and science courses in preparation for one of the following degree programs:

- B.Sc. (Agricultural & Environmental Sciences)
- B.Eng. (Bioresource)
- B.Sc. (Nutritional Sciences)
- B.Sc. (Food Science)
- Concurrent B.Sc. (Food Science) and B.Sc. (Nutritional Sciences)

Students who have completed the Diploma of Collegial Studies, Advanced Placement Exams, Advanced Levels, the International Baccalaureate, the French Baccalaureate, and/or McGill placement examinations may receive exemption and/or credit for all or part of the Foundation Year courses (basic science courses in biology, chemistry, physics, and mathematics). Students who have completed courses at other universities or colleges may also receive exemptions and/or credits. Students should consult with the Faculty's Student Affairs Office.

### 5.1.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Foundation Year Program (30 credits)

The B.Sc.(Ag.Env.Sc.); Foundation Year Program is designed to provide core science prerequisites for those entering university for the first time from a high school system (outside of the Quebec CEGEP system).

#### All majors except Agricultural Economics:

##### Required Courses (27 credits)

AEBI 120	(3)	General Biology
AECH 110	(4)	General Chemistry 1
AECH 111	(4)	General Chemistry 2
AEMA 101	(4)	Calculus 1 with Precalculus
AEMA 102	(4)	Calculus 2
AEPH 112	(4)	Introductory Physics 1
AEPH 114	(4)	Introductory Physics 2

##### Elective Course (3 credits)

Course selection is done in consultation with the program adviser.

#### Agricultural Economics Major

##### Required Courses (21 credits)

AEBI 120	(3)	General Biology
AECH 110	(4)	General Chemistry 1
AEMA 101	(4)	Calculus 1 with Precalculus
AEMA 102	(4)	Calculus 2
AGEC 200	(3)	Principles of Microeconomics
BREE 103	(3)	Linear Algebra

##### Complementary Courses (3-6 credits)

Course selection is done in consultation with the program adviser.

### 5.1.2 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Foundation Year Program (30 credits)

The B.Eng.(Bioresource); Foundation Year Program is designed to provide core science prerequisites for those entering university for the first time from a high school system (outside of the Quebec CEGEP system).

#### Required Courses (30 credits)

AEBI 120	(3)	General Biology
AECH 110	(4)	General Chemistry 1
AECH 111	(4)	General Chemistry 2
AEMA 101	(4)	Calculus 1 with Precalculus
AEMA 102	(4)	Calculus 2
AEPH 113	(4)	Physics 1
AEPH 115	(4)	Physics 2
BREE 103	(3)	Linear Algebra

### 5.1.3 Bachelor of Science (Food Science) (B.Sc.(F.Sc.)) - Foundation Year Program (30 credits)

The B.Sc.(F.Sc.); Foundation Year Program is designed to provide core science prerequisites for those entering university for the first time from a high school system (outside of the Quebec CEGEP system).

#### Required Courses (30 credits)

AEBI 120	(3)	General Biology
AEBI 122	(3)	Cell Biology
AECH 110	(4)	General Chemistry 1
AECH 111	(4)	General Chemistry 2
AEMA 101	(4)	Calculus 1 with Precalculus
AEMA 102	(4)	Calculus 2
AEPH 112	(4)	Introductory Physics 1
AEPH 114	(4)	Introductory Physics 2

### 5.1.4 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Foundation Year Program (30 credits)

The B.Sc.(Nutr.Sc.); Foundation Year Program is designed to provide core science prerequisites for those entering university for the first time from a high school system (outside of the Quebec CEGEP system).

#### Required Courses (30 credits)

AEBI 120	(3)	General Biology
AEBI 122	(3)	Cell Biology
AECH 110	(4)	General Chemistry 1
AEMA 101	(4)	Calculus 1 with Precalculus
AEMA 102	(4)	Calculus 2
AEPH 112	(4)	Introductory Physics 1
AEPH 114	(4)	Introductory Physics 2
FDSC 230	(4)	Organic Chemistry

### 5.1.5 Concurrent Bachelor of Science Food Science (B.Sc. (F.Sc.)) and Bachelor of Science Nutritional Sciences (B.Sc. (Nutr.Sc.)) - Foundation Year Program (Concurrent) (30 credits)

The Concurrent B.Sc.(F.Sc.) and B.Sc.(Nutr.Sc.); Foundation Year Program is designed to provide core science prerequisites for those entering university for the first time from a high school system (outside of the Quebec CEGEP system).

#### Required Courses (30 credits)

AEBI 120	(3)	General Biology
AEBI 122	(3)	Cell Biology
AECH 110	(4)	General Chemistry 1
AEMA 101	(4)	Calculus 1 with Precalculus
AEMA 102	(4)	Calculus 2
AEPH 112	(4)	Introductory Physics 1
AEPH 114	(4)	Introductory Physics 2
FDSC 230	(4)	Organic Chemistry

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

Please refer to [section 4.3: 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.

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

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

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

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

The B.Sc.(Agr.Env.Sc.); Major in Agricultural Economics is designed to meet the demand for sustainable development as it relates to the environment and resource use, and the economics and management of the global agriculture and food system. This multidisciplinary program in applied economics involves the application of theory and analytical methods to

MGCR 211 (3) Introduction to Financial Accounting

### Complementary Courses (6 credits)

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

Statistics

Written/Oral Communication

### Specialization (24 credits)

Specializations designed to be taken with the Agricultural Economics Major:

Students taking the Major in Agricultural Economics must take one of the following specializations:

- Agribusiness (24 credits)

- Environmental Economics (24 credits)

Students who take the Specialization in Agribusiness can also take the Specialization in Professional Agrology for Agribusiness (24 credits). Membership to the OAQ requires successful completion of the Agribusiness and Professional Agrology for Agribusiness specializations.

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.

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

This program is currently not offered.

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 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 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.

### 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 and Methodology
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 Major:

- Agribusiness (24 credits)\*
- Environmental Economics (24 credits)
- Professional Agrology (21 credits)\*

\* Membership to the OAQ requires successful completion of these two specializations.

Note: For a complete list of specializations offered for students in the Bachelor of Science in Agricultural and Environmental Sciences, please refer to

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
BREE 329	(3)	Precision Agriculture
ENVB 210	(3)	The Biophysical Environment
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**





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

### **Honours Plan B**

6 credits of Honours project courses in the subject area of the student's Major as well as 6 credits in 400- or 500-level courses, normally selected from the Faculty of Agricultural and Environmental Sciences, in consultation with the Program Director of the student's Major and the professor who has agreed to supervise the project.

AGRI 405	(3)	Honours Project 1
AGRI 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\*

\* 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.

#### **5.2.1.5 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 work

## 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.

### 5.2.1.6 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Environmental Biology (54 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 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 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 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 Prerequisites**

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

**Required Courses (36 credits)**

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
ENVB 210	(3)	The Biophysical Environment
ENVB 222	(3)	St. Lawrence Ecosystems
ENVB 305	(3)	Population and Community Ecology
ENVB 410	(3)	Ecosystem Ecology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology

**Complementary Courses (18 credits)**

6 credits from the following:

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
ENVB 529	(3)	GIS for Natural Resource Management
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

**Honours Courses**

12 credits of Honours Plan A or Plan B:

**Honours Plan A**

12 credits of 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.

ENVB 401	(6)	Honours Research Project 1
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**Complementary Courses (9 credits)**

AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 499	(3)	Agricultural Development Internship
ANSC 420	(3)	Animal Biotechnology
BREE 217	(3)	Hydrology and Water Resources
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
NRSC 221	(3)	Environment and Health
NUTR 501	(3)	Nutrition in the Majority World
PLNT 300	(3)	Cropping Systems
PLNT 435	(3)	Plant Breeding
SOIL 315	(3)	Soil Nutrient Management
SOIL 326	(3)	Soils in a Changing Environment

**Specialization (24 credits)**

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

**5.2.1.8 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Global Food Security (54 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 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. 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 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 program provides a global perspective on agriculture and food security, and addresses issues related to rural development, malnutrition, poverty and food safety with special emphasis on the developing world. Using a multidimensional and multidisciplinary approach, the program provides students with a comprehensive set of courses at McGill in combination with hands-on experience through structured internships and study abroad opportunities. The field experience (short courses, internships, or full semester) includes project development in local communities, observing subsistence agriculture in situ, and participating in various activities which sensitize students to the challenges that countries face to feed their people. Students will have the opportunity to develop the knowledge base needed for successful careers in government, non-government, and international institutions in the areas of international and sustainable development, international research and project management, agri-business, and food and agriculture policy analysis.

**Program Prerequisites**

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

**Required Courses (33 credits)**

AEBI 210	(3)	Organisms 1
AEMA 310	(3)	Statistical Methods 1
AGEC 200	(3)	Principles of Microeconomics
AGEC 442	(3)	Economics of International Agricultural Development
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
AGRI 493	(3)	International Project Management

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 (21 credits)**

9 credits from the following:

AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 499	(3)	Agricultural Development Internship
ANSC 420	(3)	Animal Biotechnology
BREE 217	(3)	Hydrology and Water Resources
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
NRSC 221	(3)	Environment and Health
NUTR 501	(3)	Nutrition in the Majority World
PLNT 300	(3)	Cropping Systems
PLNT 435	(3)	Plant Breeding

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### **5.2.1.9 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.

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
		Evolution and Ph





LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
LSCI 401	(6)	Honours Research Project 1
		Honours Research Project 2ct 1

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.

## 5.2.2 Specializations

The faculty offers the following specializations, to be paired with a B.Sc.(Ag.Env.Sc.) major. Each major program description has a list of suggested specializations. A different specialization may be selected following a consultation with your academic advisor.

### 5.2.2.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Agribusiness (24 credits)

The development of commercial agriculture relies on a large supporting sector of manufacturing and service companies involved in the supply of inputs to farming and the transportation, processing, and marketing of agricultural and food products.

This 24-credit specialization includes courses in agricultural sciences, agribusiness, and courses at the Desautels Faculty of Management.

This specialization is limited to students in the Major in Agricultural Economics.

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

#### Required Courses (12 credits)

AEBI 210	(3)	Organisms 1
AGEC 450	(3)	Agribusiness Management
AGEC 491	(3)	Research and Methodology
ANSC 250	(3)	Principles of Animal Science

#### Complementary Courses (12 credits)

9 credits chosen from the following list:

ACCT 361	(3)	Management Accounting
AGRI 310	(3)	Internship in Agriculture/Environment
BUSA 364	(3)	Business Law 1
MGCR 222	(3)	Introduction to Organizational Behaviour
MGCR 331	(3)	Information Technology Management
MGCR 341	(3)	Introduction to Finance
MGCR 352	(3)	Principles of Marketing
MGCR 382	(3)	International Business
ORGB 321	(3)	Leadership

3 credits of a course in Animal Production or Plant Production approved by the Adviser.

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

The specialization in Animal Biology is intended for students who wish to further their studies in the basic biology of large mammals and birds. Successful completion of the program should enable students to qualify for application to most veterinary colleges in North America, to study in a variety of postgraduate biology programs, and to work in many laboratory settings.

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

#### Required Courses (15 credits)

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
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 555	(3)	The Use and Welfare of Animals
ANSC 560	(3)	Biology of Lactation
ANSC 565	(3)	Applied Information Systems
LSCI 451	(3)	Research Project 1

**5.2.2.3 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
PARA 424	(3)	Fundamental 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
ANSC 555	(3)	The Use and Welfare of Animals
FAES 371	(1)	Special Topics 01

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

The B.Sc.(Ag.Env.Sc.); Specialization in Animal Production focuses on the improved efficiency of livestock production at the national and international levels including 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, this program conforms with the eligibility requirements of the Ordre des agronomes du Québec.

The credits within this Specialization may not count towards the student's Major or other Specialization. All of the 24 credits count only for this Specialization.

#### Required Courses (21 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 555	(3)	The Use and Welfare of Animals

#### Complementary Courses (3 credits)

3 credits from the following:

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

#### 5.2.2.5 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 mis-use often degrades the ability of ecosystems to provide the benefits and services we value. In the Applied Ecology specialization 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. You will learn concepts and tools that help you to deal with the complexity that an ecosystem perspective brings. The goal of this specialization 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 (9 credits)

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

#### Complementary Courses (15 credits)

15 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 330	(3)	Insect Biology
ENTO 340	(3)	Field Entomology
ENVB 301	(3)	Meteorology
ENVB 313	(3)	Phylogeny and Biogeography
ENVB 415	(3)	Ecosystem Management
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVB 506	(3)	Quantitative Methods: Ecology
ENVB 530	(3)	Advanced GIS for Natural Resource Management
MICR 331	(3)	Microbial Ecology



**Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) – Environmental Economics (24 credits)**

This specialization integrates environmental sciences and decision making with the economics of environment and sustainable dev to prepare students for careers in natural resource management and the analysis of environmental problems and policies.

This specialization is limited to students in the Major Agricultural Economics.

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

**Required Cour**

A	(3)	Research and Methodology
ENVB 305	(3)	Population and Community Ecology
ENVB 437	(3)	Assessing En
ENVB 506	(3)	Quantitative Methods: Ecology

**Complementar ses (12 credits)**

12 credits chosen from the following list:

A	(3)	Internship in Agriculture/Environment
BREE 217	(3)	Hydrology and Water Resources
BREE 327	(3)	Bio-En
ECON 225	(3)	Economics of the Environment
ECON 326	(3)	Ecological Economics
ECON 405	(3)	Natural Resource Economics
ENVB 222	(3)	St. Lawrence Ecosystems
ENVB 529	(3)	GIS for Natural Resource Management
ENVR 203	(3)	Knowledge, Ethics and Environment
MGPO 440	(3)	Strategies for Sustainability
MICR 331	(3)	Microbial Ecology
NRSC 333	(3)	Pollution and Bioremediation

**5.2.2.8 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - International Agriculture (24 credits)**

Students enter this specialization to acquire a global and applied understanding of agriculture as a fundamental tool to help rural development, alleviate poverty and reach food security, especially in the developing world. This program pro work at McGill together with a hands-on experience in a developing country, meeting locals and attending courses with McGill professors and/or local instructors. The costs of these xperiences may vary. The field experience (semester, short course or internship) includes dveloping projects in local communities, observing subsistence arious activities which contribute to sensitizing the students to the challenges that developing countries face. Students ater resources, sustainable de velopment, nutrition, planning and de velopment, and a host of other Fascinating topics, allowing them to sharpen their skills for future career opportunities.

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

**Required Cour**

A	(3)	Economics of International Agricultural Development
A	(3)	Global Issues on De velopment, Food and Agriculture

**Complementar ses (18 credits)**

Students select 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 the Majority World
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

3 credits from the list in Option A

**5.2.2.9 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 in a variety of diverse bioscience industries; students with an appropriate CGPA may proceed to a wide variety of postgraduate programs or professional schools.

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

**Complementary Courses (24 credits)**

24 credits selected from the following list:

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 350	(3)	Food-Borne Pathogens
ANSC 420	(3)	Animal Biotechnology
ANSC 424	(3)	Metabolic Endocrinology
ANSC 433	(3)	Animal Nutrition and Metabolism
ANSC 560	(3)	Biology of Lactation
ANSC 565	(3)	Applied Information Systems
BINF 511	(3)	Bioinformatics for Genomics

## Experiments in Biotechnology



**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 535	(3)	Functional Genomics in Model Organisms
BTEC 555	(3)	Structural Bioinformatics
FDSC 442	(3)	Food Microbiology
MIMM 324	(3)	Fundamental Virology
PLNT 304	(3)	Biology of Fungi

**Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Plant Biology (24 credits)**

PLNT 305	(3)	Plant Pathology
PLNT 310	(3)	Plant Propagation
PLNT 353	(3)	Plant Structure and Function
PLNT 434	(3)	Weed Biology and Control
PLNT 435	(3)	Plant Breeding

**Complementary Courses (6 credits)**

6 credits of complementary courses selected from:

AGRI 340	(3)	Principles of Ecological Agriculture
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)	Soil Ecology

**5.2.2.13 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Professional Agrology (24 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. This Specialization focuses on working in the professional agrology industry and covers agricultural legislation as well as professional conduct.

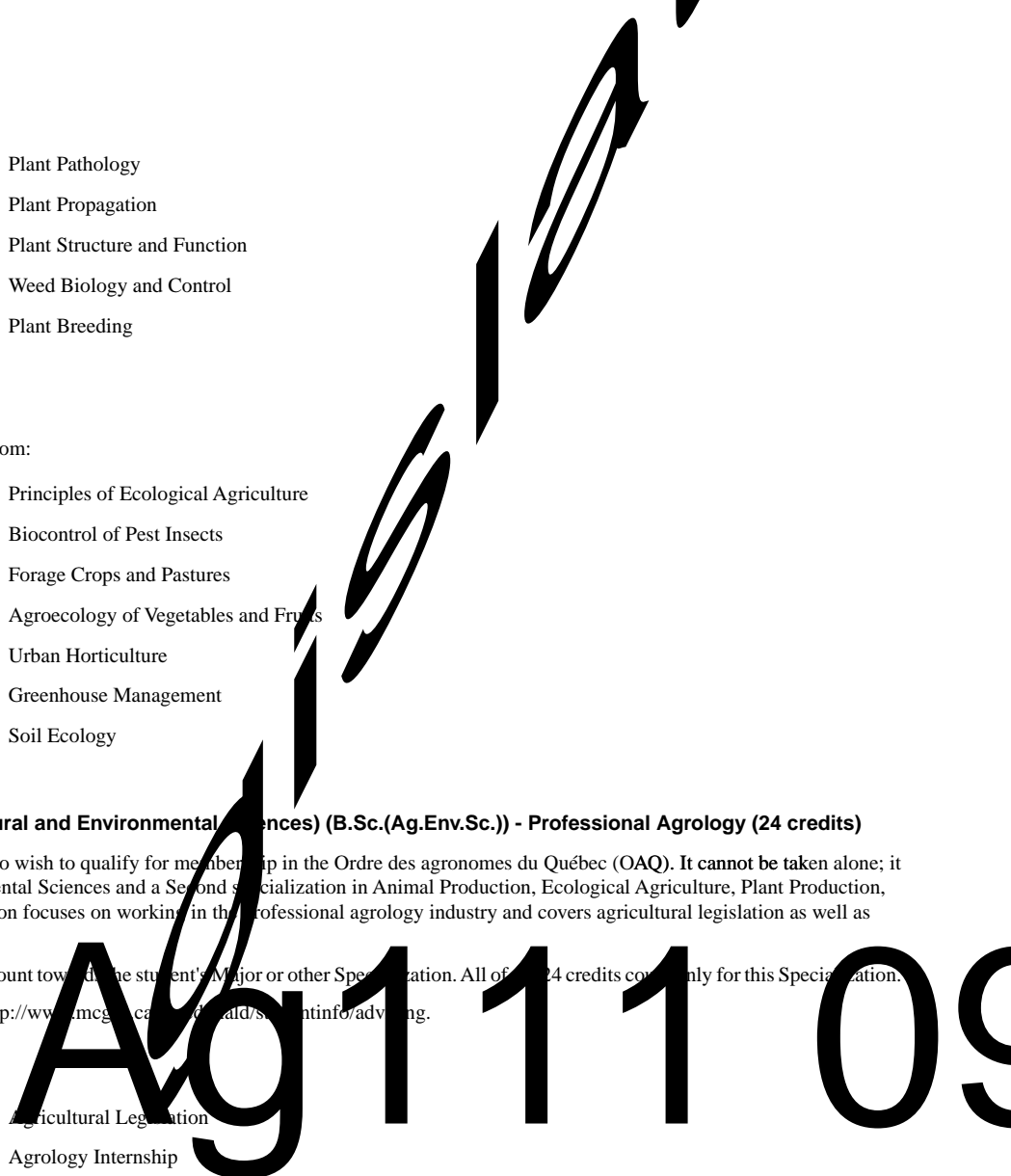
The credits within this specialization may not count toward the student's Major or other Specialization. All of the 24 credits count only for this Specialization.

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

**Required Courses (15 credits)**

AGRI 330	(1)	Agricultural Legislation
AGRI 410D1	(3)	Agrology Internship
AGRI 410D2	(3)	Agrology Internship
AGRI 430	(2)	Professional Practice in Agrology
AGRI 490	(3)	Agri-Food Industry Project
PLNT 430	(3)	Pesticides in Agriculture

**Complementary Courses (9 credits)**



AGRI 430	(2)	Professional Practice in Agrology
AGRI 490	(3)	Agri-Food Industry Project

**Complementary Courses (12 credits)**

6 credits from:

AEBI 212	(3)	Evolution and Phylogeny
LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology

3 credits from:

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

3 credits from:

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

**5.2.2.15 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)	Soil Ecology

**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

#### 5.2.2.16 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 (15 credits)

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

#### Complementary Courses (9 credits)

9 credits from the following:

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

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

For more information on this major, please see [section 4.4: Bachelor of Engineering in Bioresource Engineering – B.Eng.\(Bioresource\) \(Overview\)](#).

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

The B.Eng.(Bioresource); Major in Bioresource Engineering program focuses on biological, agricultural, food, environmental areas, and applying professional engineering skills to biological systems. The design and implementation of technology for the creation of bio-based products, including food, fiber, fuel, and biomaterials, while sustaining a healthful environment. Graduates of this program are eligible for registration as professional engineers in any province across Canada, as well as in some international jurisdictions.

#### Required Courses (62 credits)

AEMA 202	(3)	Intermediate Calculus
AEMA 305	(3)	Differential Equations
BREE 205	(3)	Engineering Design 1
BREE 210	(3)	Mechanical Analysis and Design
BREE 216	(3)	Bioresource Engineering Materials
BREE 252	(3)	Computing for Engineers

BREE 301	(3)	Biothermodynamics
BREE 305	(3)	Fluid Mechanics
BREE 312	(3)	Electric Circuits and Machines
BREE 319	(3)	Engineering Mathematics
BREE 327	(3)	Bio-Environmental Engineering
BREE 341	(3)	Mechanics of Materials
BREE 415	(3)	Design of Machines and Structural Elements
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
	(1)	Senior Undergraduate Seminar

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
ENVR 203	(3)	Knowledge, Ethics and Environment
SEAD 530	(3)	Economics for Sustainability in Engineering and Design
SOCI 235	(3)	Technology and Society

Note: ENVR courses have limited enrolment.

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

27 credits from the following list , 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 322	(3)	Organic Waste Management
BREE 325	(3)	Food Process Engineering
BREE 329	(3)	Precision Agriculture
BREE 403	(3)	Biological Material Properties
BREE 412	(3)	Machinery Systems Engineering
BREE 416	(3)	Engineering for Land Development
BREE 419	(3)	Structural Design
BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 502	(3)	Drainage/Irrigation Engineering
BREE 505	(3)	Life Cycle Assessment for Sustainable Agrifood Systems
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

### 5.3.2 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Honours Bioresource Engineering (113 credits)

The B.Eng.(Bioresource); Honours in Bioresource Engineering program focuses on biological, agricultural, food, environmental areas, and applying professional engineering skills to biological systems. The design and implementation of technology for the creation of bio-based products, including food, fibre, fuel, and biomaterials, while sustaining a healthful environment. Graduates of this program are eligible for registration as professional engineers in any province across Canada, as well as in some international jurisdictions.

#### Required Courses (68 credits)

AEMA 202	(3)	Intermediate Calculus
AEMA 305	(3)	Differential Equations
BREE 205	(3)	Engineering Design 1
BREE 210	(3)	Mechanical Analysis and Design
BREE 216	(3)	Bioresource Engineering Materials
BREE 252	(3)	Computing for Engineers
BREE 301	(3)	Biothermodynamics
BREE 305	(3)	Fluid Mechanics
BREE 312	(3)	Electric Circuits and Machines
BREE 319	(3)	Engineering Mathematics
BREE 327	(3)	Bio-Environmental Engineering
BREE 341	(3)	Mechanics of Materials
BREE 415	(3)	Design of Machines and Structural Elements
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
BREE 490	(3)	Engineering Design 2
BREE 495	(3)	Engineering Design 3
BREE 504	(3)	Instrumentation and Control
FACC 250	(0)	Responsibilities of the Professional Engineer
FACC 300	(3)	Engineering Economy
FACC 400	(1)	Engineering Professional Practice
FAES 405	(3)	Honours Project 1
FAES 406	(3)	Honours Project 2
MECH 289	(3)	Design Graphics

#### Complementary Courses (45 credits)

##### 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**

3 credits chosen from the list below:

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2
ENVB 210	(3)	The Biophysical Environment
ENVB 305	(3)	Population and Community Ecology
LSCI 202	(3)	Molecular Cell Biology
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology
PLNT 300	(3)	Cropping Systems

Plus 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
ENVR 203	(3)	Knowledge, Ethics and Environment
SEAD 530	(3)	Economics for Sustainability in Engineering and Design
SOCI 235	(3)	Technology and Society

Note: ENVR courses have limited enrolment.

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**

21 credits from the following list, 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 322	(3)	Organic Waste Management
BREE 325	(3)	Food Process Engineering
BREE 329	(3)	Precision Agriculture
BREE 403	(3)	Biological Material Properties
BREE 412	(3)	Machinery Systems Engineering
BREE 416	(3)	Engineering for Land Development
BREE 419	(3)	Structural Design
BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 502	(3)	Drainage/Irrigation Engineering
BREE 505	(3)	Life Cycle Assessment for Sustainable Agrifood Systems



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

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

The B.Eng.(Bioresource); Major in Bioresource Engineering; Professional Agrology program focuses on biological, agricultural, food, environmental areas, and applying professional engineering skills to biological systems. The design and implementation of technology for the creation of bio-based products, including food, fibre, fuel, and biomaterials, while sustaining a healthful environment. Graduates of this program are eligible for registration as professional engineers in any province across Canada, as well as in some international jurisdictions. This program qualifies graduates to apply for registration in the Ordre des agronomes du Québec and similar licensing bodies in other provinces in addition to the professional engineer licensing.

#### Required Courses (65 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
BREE 210	(3)	Mechanical Analysis and Design
BREE 216	(3)	Bioresource Engineering Materials
BREE 252	(3)	Computing for Engineers
BREE 301	(3)	Biothermodynamics
BREE 305	(3)	Fluid Mechanics
BREE 312	(3)	Electric Circuits and Machines
BREE 319	(3)	Engineering Mathematics
BREE 327	(3)	Bio-Environmental Engineering
BREE 341	(3)	Mechanics of Materials
BREE 415	(3)	Design of Machines and Structural Elements
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
BREE 490	(3)	Engineering Design 2
BREE 495	(3)	Engineering Design 3

BREE 504

(3)

Instrumentation and Control

FACC 250

(0)

Responsibilities of the Professional Engineer

3 credits from the following list:

ENVR 201	(3)	Society, Environment and Sustainability
ENVR 203	(3)	Knowledge, Ethics and Environment
SEAD 530	(3)	Economics for Sustainability in Engineering and Design
SOCI 235	(3)	Technology and Society

Note: ENVR courses have limited enrolment.

### **Set D - Engineering**

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

Minimum of 6 credits from each of Group 1, Group 2 and Group 3 with the option (and approval of the Academic Adviser) of taking 6 credits from courses offered in the Faculty of Engineering.

#### **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 502	(3)	Drainage/Irrigation Engineering
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 Pr**

**Bachelor of Engineering (Bioresource) – B.Eng.(Bioresour**

LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health

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

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 516	(3)	Flavour Chemistry
FDSC 540	(3)	Sensory Evaluation of Foods

#### **Elective Courses (18 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.

#### **5.4.2 Bachelor of Science (Food Science) (B.Sc.(F.Sc.)) - Honours Food Science - Food Science Option (90 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 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 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.

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 hav

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
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health

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

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 516	(3)	Flavour Chemistry
FDSC 540	(3)	Sensory Evaluation of Foods

#### **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

#### **Elective Courses (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.

#### **5.4.3 Bachelor of Science (Food Science) (B.Sc.(F.Sc.)) - Major Food Science - Food Chemistry 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 Chemistry Option can also qualify for recognition by the Institute of Food Technologists (IFT) and the Ordre des chimistes du Québec (OCQ). Food Chemistry Option is completed to 90 credits with free elective courses.

Please 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 (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)**ses - Food ChemistrFDSC 442

#### **5.4.4 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 allows students to complete two degrees at once while offering the best education in these complementary fields. This program opens the door to a multitude of career paths in the nutrition and food industries.

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.

##### **5.4.4.1 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 kno



### **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 342	(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 536	(3)	Food Traceability
FDSC 537	(3)	Nutraceutical Chemistry
NUTR 322	(3)	Applied Sciences Communication
NUTR 341	(3)	Global Food Security
NUTR 503	(3)	Nutrition and Exercise

12 credits from the following:

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

### **Elective Courses (12 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 eCalendar for prerequisites and minimum credit requirements.

### 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 38Tm((Rion 1)Tj1 0 06r).001 492.941631		Critical Nutritional Nutrition

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 (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
NUTR 301	(3)	Psychology
NUTR 322	(3)	Applied Sciences Communication
NUTR 342	(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.

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

### 5.4.5.1 Certificate in Food Science

Detailed information on this certificate program can be found under [section 5.7.2: Certificate \(Cert.\) Food Science \(30 credits\)](#) in this publication.

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

Please refer to [section 4.6: Bachelor of Science in Nutritional Sciences – B.Sc.\(Nutr.Sc.\) \(Overview\)](#) for advising and other information regarding the Dietetics and Nutrition majors.

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

The B.Sc.(Nutr.Sc.) Major in Dietetics is a 3.5 year program that includes 40 weeks of internship Professional Practice (Stage) integrated in each year in a planned sequence to provide the academic and practical training for a career as a dietitian-nutritionist. The program includes innovative courses to promote

food and nutrition expertise, leadership, communication skills, management skills and critical thinking. Graduates of the program are eligible to be registered as a professional dietitian in province(s) of Canada.

This program is accredited by the P

**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.

Elective choice may include, but is not limited to:

FRSL 219	(3)	Français intermédiaire 1 : diététique et nutrition
NUTR 501	(3)	Nutrition in the Majority World
NUTR 503	(3)	Nutrition and Exercise



**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.

**5.5.3 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 of

FDSC 545	(3)	Advances in Food Microbiology
NUTR 503	(3)	Nutrition and Exercise
NUTR 507	(3)	Advanced Nutritional Biochemistry
NUTR 511	(3)	Nutrition and Behaviour
NUTR 537	(3)	Advanced Human Metabolism
NUTR 545	(4)	Clinical Nutrition 2
NUTR 546	(4)	Clinical Nutrition 3
NUTR 551	(3)	Analysis of Nutrition Data
PARA 438	(3)	Immunology

6 credits selected from:

AGEC 330	(3)	Agriculture and Food Markets
AGEC 442	(3)	Economics of International Agricultural Development
A	(3)	Principles of Ecological Agriculture



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
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
PARA 438	(3)	Immunology

### 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 the Majority World
NUTR 503	(3)	Nutrition and Exercise
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
PARA 424	(3)	Fundamental Parasitology
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, and Cardiovascular Physiology
PHGY 313	(3)	Blood, Gastrointestinal, and Immune Systems Physiology

### **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 an

NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 537	(3)	Advanced Human Metabolism

### Complementary Courses (12 credits)

12 credits of complementary courses are selected as follows:

#### Common Complementary Courses

6 credits from the following:

ANSC 433	(3)	Animal Nutrition and Metabolism
ANSC 560	(3)	Biology of Lactation
FDSC 537	(3)	Nutraceutical Chemistry
FDSC 545	(3)	Advances in Food Microbiology
NUTR 501	(3)	Nutrition in the Majority World
NUTR 503	(3)	Nutrition and Exercise
NUTR 505	(3)	Public Health Nutrition
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

6 credits from the following courses:

ANAT 214	(3)	Systemic Human Anatomy
ANAT 261	(4)	Introduction to Dynamic Histology
ANAT 262	(3)	Introductory Molecular and Cell Biology
ANAT 322	<del>(3)</del> (3)A(3)AAA	Neuroendocrinology
ANSC 312	(3)	Animal Health and Disease
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 560	(3)	Biology of Lactation
BIOL 300	(3)	Molecular Biology of the Gene
BTEC 306	(3)	Experiments in Biotechnology
MICR 341	(3)	Mechanisms of Pathogenicity
NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1
PARA 424	(3)	Fundamental Parasitology
PATH 300	(3)	Human Disease

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### 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.

### 5.5.6 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Sports Nutrition (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 sports nutrition integrates the influence of exercise and physical activity on health and chronic disease prevention. 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 (63 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
EDKP 395	(3)	Exercise Physiology
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 503	(3)	Nutrition and Exercise
NUTR 512	(3)	Herbs, Foods and Phytochemicals

### Complementary Courses (12 credits)

12 credits of complementary courses are selected as follows:

#### Common Complementary Courses

6 credits from the following:

ANSC 433	(3)	Animal Nutrition and Metabolism
ANSC 560	(3)	Biology of Lactation
FDSC 537	(3)	Nutraceutical Chemistry

FDSC 545	(3)	Advances in Food Microbiology
NUTR 501	(3)	Nutrition in the Majority World
NUTR 505	(3)	Public Health Nutrition
NUTR 507	(3)	Advanced Nutritional Biochemistry
NUTR 511	(3)	Nutrition and Behaviour
NUTR 537	(3)	Advanced Human Metabolism
NUTR 545	(4)	Clinical Nutrition 2
NUTR 546	(4)	Clinical Nutrition 3
NUTR 551	(3)	Analysis of Nutrition Data
PARA 438	(3)	Immunology

6 credits from:

ANAT 214	(3)	Systemic Human Anatomy
EDKP 261	(3)	Motor Development
EDKP 330	(3)	Physical Activity and Public Health
EDKP 445	(3)	Exercise Metabolism
EDKP 446	(3)	Physical Activity and Ageing
EDKP 448	(3)	Exercise and Health Psychology
EDKP 449	(3)	Neuromuscular and Inflammatory Pathophysiology
EDKP 485	(3)	Cardiopulmonary Exercise Pathophysiology
EDKP 495	(3)	Scientific Principles of Training
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.

### 5.5.7 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Honours in Nutrition (90 credits)

B.Sc.(Nutr.Sc.); Honours in Nutrition is intended for students who are interested in gaining a concentrated research experience in Human Nutrition. Students in the B.Sc.(Nutr.Sc.) Nutrition Major program who have a CGPA of at least 3.6, and a grade of at least A- in all NUTR courses can apply to transfer in Winter U2 term. It is the responsibility of each student to find a professor to support and supervise a research project. Graduation requires completion of a minimum of 90 credits, with CGPA of at least 3.6, and a grade of at least A- in all NUTR courses. Students who do not maintain Honours standing may transfer registration to the B.Sc.(Nutr.Sc.) Nutrition Major.

### Required Courses (75 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 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 491	(3)	Honours Research 1
NUTR 492	(3)	Honours Research 2
NUTR 493	(3)	Honours Research 3
NUTR 494	(3)	Honours Research 4
NUTR 507	(3)	Advanced Nutritional Biochemistry
NUTR 537	(3)	Advanced Human Metabolism
NUTR 551	(3)	Analysis of Nutrition Data

#### **Elective Courses (15 credits)**

15 credits chosen in consultation with the research supervisor, a limited number of credits may be taken at other Quebec and/or Canadian universities.

### **5.5.8 Bachelor of Science (Nutritional Sciences) – Related Programs**

#### **5.5.8.1 Minor in Human Nutrition**

Detailed information on this Minor can be found under [section 5.6.10: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor Human Nutrition \(24 credits\)](#) in this publication.

#### **5.5.8.2 Concurrent Bachelor of Science in Food Science – B.Sc.(F.Sc.) and Bachelor of Science in Nutritional Sciences – B.Sc.(Nutr.Sc.) – Food Science/Nutritional Science Major**

Detailed information on this concurrent program can be found under [section 5.4.4.1: 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 \(Concurrent\) \(122 credits\)](#) in this publication.

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## **5.6 Minor Programs**

The Faculty of Agricultural and Environmental Sciences offers a number of minor programs; the following are offered by the F

diverse manifestations of entrepreneurship in the world including but not limited to new ventures, social enterprise, tech start-ups, cooperatives, corporate venturing, side hustles, and passion projects.

#### **Required Courses (9 credits)**

INTG 215	(3)	Entrepreneurship Essentials for Non-Management Students
MGPO 362	(3)	Fundamentals of Entrepreneurship
MGPO 364	(3)	Entrepreneurship in Practice

#### **Complementary Courses (9 credits)**

3 credits from the following:

MGCR 211	(3)	Introduction to Financial Accounting
MGCR 222	(3)	Introduction to Organizational Behaviour
MGCR 331	(3)	Information Technology Management
MGCR 341	(3)	Introduction to Finance
MGCR 352	(3)	Principles of Marketing
MGCR 372	(3)	Operations Management.
MGCR 382	(3)	International Business
MGCR 423	(3)	Strategic Management
MGCR 460	(3)	Social Context of Business.

#### **Complementary Courses (6 credits)**

6 credits from the following:

AGEC 231	(3)	Economic Systems of Agriculture
AGEC 332	(3)	Farm Management and Finance
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 450	(3)	Agribusiness Management
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
AGRI 493	(3)	International Project Management
FAES 300*	(3)	Internship 2
FAES 310	(3)	Agribusiness Entrepreneurship

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

AGEC 333 (3) Resource Economics

### Complementary Courses (12 credits)

12 credits of complementary courses selected from:

AGEC 231	(3)	Economic Systems of Agriculture
AGEC 242	(3)	Management Theories and Practices
AGEC 320	(3)	Intermediate Microeconomic Theory
AGEC 332	(3)	Farm Management and Finance
AGEC 425	(3)	Applied Econometrics
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
AGEC 450	(3)	Agribusiness Management
AGEC 491	(3)	Research and Methodology
AGEC 492	(3)	Special Topics in Agricultural Economics 01

#### 5.6.4 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Minor Agricultural Production (24 credits)

This Minor program is designed to allow students in non-agricultural production majors to receive credit for courses in agricultural production and to stimulate "cross-over" studies. The Minor can be associated with existing major programs in the Faculty, but in some instances it may require more than 90 credits to meet the requirements of both the Major and the Minor.

Students are advised to consult their major program adviser and the Academic Adviser of the Minor in their first year. At the time of registration for their penultimate year, students must declare their intent to obtain a Minor Agricultural Production. With the agreement of their major program adviser, they must submit their program of courses already taken, and to be taken in their final year, to the Academic Adviser of the Agricultural Production Minor. The Academic Adviser of the Agricultural Production Minor will then certify which courses the student will apply toward the Minor and that the student's program conforms with the requirements of the Minor.

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 well before their final year.
2. Not all courses are offered every year. For information on available courses, consult Class Schedule at <http://www.mcgill.ca/minerva>. Complete listings can be found in the "Courses" section of this eCalendar.

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

### General Regulations

To obtain a Minor in Agricultural Production, students must:

- 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 Courses (12 credits)

AEBI 210	(3)	Organisms 1
ANSC 250	(3)	Principles of Animal Science
ENVB 210	(3)	The Biophysical Environment
PLNT 300	(3)	Cropping Systems

### Complementary Courses (12 credits)

12 credits chosen from the following list in consultation with the Academic Adviser for the Minor:

AGRI 215	(3)	Agro-Ecosystems Field Course
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AGRI 340	(3)	Principles of Ecological Agriculture
ANSC 451	(3)	Dairy and Beef Production Management
ANSC 458	(3)	Swine and Poultry Production
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits

### 5.6.5 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Minor Animal Biology (24 credits)

The Minor Animal Biology is intended for students who wish to further their studies in the basic biology of large mammals and birds. Successful completion of the program should provide students with a sound background in the field of biomedical studies and the use of animal models. It should also qualify students to apply to most veterinary colleges in North America, to study in a variety of postgraduate biology programs, and to work in many laboratory settings.

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

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

#### Required Courses (15 credits)

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
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 555	(3)	The Use and Welfare of Animals
ANSC 560	(3)	Biology of Lactation
ANSC 565	(3)	Applied Information Systems
LSCI 451	(3)	Research Project 1

### 5.6.6 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



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
SOIL 535	(3)	Soil Ecology
WILD 302	(3)	Fish Ecology
WILD 307	(3)	Natural History of Vertebrates
WILD 350	(3)	Mammalogy
WILD 420	(3)	Ornithology
WILD 421	(3)	Wildlife Conservation

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

The Minor Ecological Agriculture is designed to focus on the principles underlying the practice of ecological agriculture and is suitable for students wishing to farm and do extension and government work, and those intending to pursue postgraduate studies in this field.

This Minor can be associated with existing major programs in the Faculty, but in some instances it may require more than 90 credits to meet the requirements of both the Major and the Minor.

Students are advised, during the U1 year, to consult their Major program adviser and the Academic Adviser of the Minor. At the time of registration for the U2 year, students must declare their intent to obtain the Minor. W

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

### **5.6.9 Minor in Environmental Engineering**

The Minor program consists of 21 credits in courses that are environment related. This requires the careful selection of complementary courses to permit

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

9 credits from:

ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
MIMM 314	(3)	Intermediate Immunology
NUTR 344	(4)	Clinical Nutrition 1
NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1
NUTR 501	(3)	Nutrition in the Majority World
NUTR 503	(3)	Nutrition and Exercise
NUTR 505	(3)	Public Health Nutrition
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data
PARA 438	(3)	Immunology
PATH 300	(3)	Human Disease

#### 5.6.11 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Minor International Agriculture (24 credits)

Students enter this minor to acquire a global and applied understanding of agriculture as a fundamental tool to help rural development, alleviate poverty and reach food security, especially in the developing world. This program provides students with a combination of coursework at McGill together with a hands-on experience in a developing country, meeting locals and attending courses with McGill professors and/or local instructors. The costs of these field experiences may vary. The field experience (semester, short course or internship) includes developing projects in local communities, observing subsistence agriculture in situ and participating in various activities which contribute to sensitizing the students to the challenges that developing countries face. Students study water resources, sustainable development, nutrition, planning and development, and a host of other fascinating topics, allowing them to sharpen their skills for future career opportunities.

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

##### Required Courses (6 credits)

AGEC 442	(3)	Economics of International Agricultural Development
AGRI 411	(3)	Global Issues on Development, Food and Agriculture

##### Complementary Courses (18 credits)

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 the Majority World
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:

Africa 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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## 5.7 Post-Baccalaureate Certificate Programs

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

### 5.7.1 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 toward the requirements of the Specialization/Minor/Certificate are limited to an experience on farms or other enterprises that are organic, biodynamic, or practising permaculture. The placement must be approved by the academic adviser for the specialization/Minor/certificate.

### Required Courses (12 credits)

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)	Soil Ecology

### 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
AGRI 435	(3)	Soil and Water Quality Management
ANSC 312	(3)	Animal Health and Disease
ENTO 352	(3)	Biocontrol of Pest Insects
ENVB 305	(3)	Population and Community Ecology
ENVB 415	(3)	Ecosystem Management
MICR 331	(3)	Microbial Ecology
NUTR 341	(3)	Global Food Security
PARA 424	(3)	Fundamental Parasitology
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits
PLNT 434	(3)	Weed Biology and Control
PLNT 460	(3)	Plant Ecology
SOIL 326	(3)	Soils in a Changing Environment
WOOD 441	(3)	Integrated Forest Management

### 5.7.2 Certificate (Cert.) Food Science (30 credits)

This program is geared toward mature students, who have an undergraduate degree in a science-related discipline, to acquire the basic knowledge in the food science area to enter food-related industries or a food science graduate program. Students must complete a core course that introduces them to the basics of the program. Student 30 0 1 67.522dthist y/0 11ysi249ea to en1 67.522d, q

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 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

## Field Studies

### Africa Field Study Semester

Africa Field Studies Semester (AFSS) offers students an opportunity to study in East Africa for a semester starting every January. Courses are of

[AFSS web site](#)

### Barbados Field Stud

es place at Bellairs Research Institute in Barbados; it is a full 15-credit program offered each F or more information, see  
[Abroad & Field Studies](#) graduate > : [Barbados Field Semester](#)

### Barbados Interdisciplinary Tropical Studies Field Semester

ferred in collaboration with several partners in Barbados, including the University of the  
 ve at the Bellairs Research Institute, while BITS courses are conducted both at UWI and Bellairs. F  
 > Under > : [Barbados Interdisciplinary r](#) [ield Semester](#). [Study Abroad](#)

### Panama Field Study Semester

ferred in the inter term (January to April).  
 xperience gained through an internship/research project org vironmental issues. The



- *section 6.7: Institute of Parasitology*
- *section 6.8*

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## 6.3 Farm Management and Technology Program

### 6.3.1 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: [mcgill.ca/fmt](http://mcgill.ca/fmt)

### 6.3.2 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](#).

### 6.3.3 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 Agricultural Internship during both academic semesters of Year 1 through two Stage courses.

During the second summer, students are registered in Enterprise Management 1. During this period, the students will be responsible for data collection to be used in the next for contin9 Tm(fered o94.0a9423 Tm(Agrment ce0 1 67.52 36 used inpt.1 0 1rment ce0 1Psoi1 67.52sine used home f)Tj1 18.52 (fered o94.ywilAgr

**Winter 1**

FMT4 007	(2)	Health and Safety (152-VSG-MC)
FMT4 008	(2.33)	Animal Genetics and Nutrition (152-VSH-MC)
FMT4 009	(2)	Soil Fertility (152-VSJ-MC)
FMT4 010	(1.33)	Winter Stage (152-VSK-MC)
FMT4 011	(2)	Farm Accounting (152-VSL-MC)
FMT4 012	(1.67)	Machinery Maintenance (152-VSM-MC)
FMT4 077	(2.67)	Introduction to College English

**Summer 1**

Agricultural Internship (152-VSN-MC)



#### **6.3.4.1 Entrance Requirements – FMT**

- 1.** Students should have a good practical kno

#### **6.3.4.5 Student Rights and Responsibilities**

The regulations and policies governing student rights and responsibilities at McGill Univ

Fax: 514-398-7990

Email: [info.macdonald@mcgill.ca](mailto:info.macdonald@mcgill.ca)

Website: [mcgill.ca/foodscience](http://mcgill.ca/foodscience)

#### **6.4.2 About the Department of Food Science**

**Food Science** is a multidisciplinary field involving chemistry, biochemistry, nutrition, microbiology, and processing that gives students the scientific knowledge to solve real problems associated with the many facets of the food system. Food Science is still a relatively ne

Two undergraduate degree programs are offered by the School.

- The **Dietetics** Major leads to professional qualification
- The **Nutrition** Major offers four concentrations:
  - Food Function and Safety
  - Global Nutrition
  - Health and Disease
  - 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 degree:

- Dietetics Credentialing
- Practicum
- Project

For further information, contact the School or refer to the Agricultural & Environmental Sciences' [Graduate and Postdoctoral Studies](#) section.

### **6.5.4 Academic Information and Regulations**

#### **6.5.4.1 Application Procedures**

Entry into the Dietetics major, the Nutrition major and the Freshman/Foundation Year Program of the B.Sc.(Nutr.Sc.) is only possible in September. Application deadlines:

- Applicants studying outside of Canada: **January 15**
- Applicants from Canadian high schools outside of Quebec: **February 1**
- CEGEP applicants: **March 1**
- Transfer/Second degree applicants from Canadian universities: **May 1**
- Mature students: **May 1**

Applications to the School of Human Nutrition must be submitted online. Online applications and admissions information are available at [mcgill.ca/applying](http://mcgill.ca/applying).

#### **6.5.4.2 Academic Standing**

For general information, see [section 3.5.5: Academic Standing](#).

Dietetics students please note:

- Undergraduate registration for all Professional Practice (Stage) courses is restricted to students in the Dietetics Major with a CGPA greater than or equal to 3.00. The CGPA requirement is firmly applied.
- Students in the Dietetics Major who have a CGPA below 3.0 for two consecutive years will not be permitted to continue in the program.

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## **6.6 Department of Natural Resource Sciences**

### **6.6.1 Location**

Macdonald-Stewart Building  
McGill University, Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Canada  
Telephone: 514-398-7773  
Fax: 514-398-7990  
Email: [info.macdonald@mcgill.ca](mailto:info.macdonald@mcgill.ca)  
Website: [mcgill.ca/nrs](http://mcgill.ca/nrs)



## 6.6.2 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 we also depend on ecosystems for services such as nutrient cycling, biodiversity, recreation, and the splendour 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 behaviour 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 (Bieler School of Environment);
- Agro-Environmental Sciences; and
- Agricultural Economics;

to the **specializations** such as:

- Applied Ecology;
- Wildlife Biology;
- Microbiology and Molecular Biotechnology;
- Agribusiness;
- Environmental Economics; and
- Life Sciences (Multidisciplinary).

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## 6.7 Institute of Parasitology

### 6.7.1 Location

Institute of Parasitology  
Parasitology Building  
McGill University, Macdonald Campus  
21,111 Lakeshore Road  
Sainte-Anne-de-Bellevue QC H9X 3V9  
Canada  
Website: [mcgill.ca/parasitology](http://mcgill.ca/parasitology)

### 6.7.2 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 well-being.

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

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## 6.8 Department of Plant Science

### 6.8.1 Location

Telephone: 514-398-7773

Fax: 514-398-8732

Email: [plant.science@mcgill.ca](mailto:plant.science@mcgill.ca)

Website: [mcgill.ca/plant](http://mcgill.ca/plant)

### 6.8.2 About the Department of Plant Science

Our understanding of biological systems has advanced exponentially since the beginning of 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 eight billion and continues to rise at an alarming rate; the climate is changing dramatically; 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 both the Environmental Metrics and the Food Production and Environment domains of the Bieler School of Environment. For related program information, see [section 5.2: Bachelor of Science \(Agricultural and Environmental Sciences\) – B.Sc.\(Ag.Env.Sc.\)](#).