



**Faculty of Agricultural and Environmental  
Sciences, including School of Dietetics and  
Human Nutrition**

**Programs, Courses and University Regulations  
2015-2016**



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

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

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## 2 History of the Faculty

Dedicated to improving the quality of life in Quebec's rural communities, Sir William Christopher Macdonald founded the School of Agriculture, the School for T

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### 3.4 Lyman Entomological Museum and Research Laboratory

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

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### 3.5 Brace Centre for Water Resources Management

The Brace Centre for Water Resources Management is located on the Macdonald campus. It is a multidisciplinary and advanced research and training centre of McGill University, dedicated to solving problems of water management for all human and environmental uses. It brings together staff from several McGill faculties to undertake research, teaching, specialized training, and policy and strategic studies, both in Canada and internationally. The Centre draws on the wide range of facilities available within the University. More information is available at [www.mcgill.ca/brace](http://www.mcgill.ca/brace).

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## 4 About the Faculty of Agricultural and Environmental Sciences, including School of Dietetics and Human Nutrition (Undergraduate)

The Faculty of Agricultural and Environmental Sciences and the School of Dietetics and 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 biotechna4 Tw-0.F7u27.916 Tm(Theuralrem(g)Tj1 0 TPet/mutstanding putstandi RG/F2 8ue9 c1 517hedusizepportu,)Tj0 T

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## 4.2 Administrative Officers

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

Ian Strachan; B.Sc.(Tor.), M.Sc., Ph.D.(Qu.) (*Interim*) (*Term ending Aug. 31, 2015*)

Anja Geitmann; Diplom(Konstanz), Ph.D.(Stockholm) (*Effective Sept. 1, 2015*)

### Associate Deans

Christopher Buddle; B.Sc.(Guelph), Ph.D.(Alta.) (*Student Affairs*)

Suha Jabaji; B.Sc.(AUB), M.Sc.(Guelph), Ph.D.(Wat.) (*Research*)

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

Ian Strachan; B.Sc.(Tor.), M.Sc., Ph.D.(Qu.) (*Graduate Studies*)

### Manager, Student Affairs

Silvana Pellecchia

### Director, Academic and Administrative Services

Gary O'Connell; B.Comm.(C'dia)

### Assistant Director, Athletics and Recreation

Jill Barker, B.A.(C'dia)

### General Manager, Macdonald Campus Farm

Paul Meldrum; B.J.(Hons.)(Car.)

### Supervisor, Property Maintenance

Peter D.L. Knox; B.Sc.(Agr.)(McG.)

### Manager, Residence Life and Accommodations

Lindsay O'Connell; B.A.(McG.)Gu804 0.9216 0.843c.06 Tm 1 292.599 66McG.)

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#### 4.4.1 The Student Affairs Office

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

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

#### 4.4.2 Student Services

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

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

#### 4.4.3 Macdonald Campus Residences

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

#### 4.4.4 Student Life

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

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

#### 4.4.5 Student Rights and Responsibilities

The *Handbook on Student Rights and Responsibilities* is published jointly by the Office of the Dean of Students and the University Secretariat. A copy of the Handbook can be found at [www.mcgill.ca/secretariat/policies/students](http://www.mcgill.ca/secretariat/policies/students).

#### 4.4.6 Fees

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

##### 4.4.6.1 Tuition Fees

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

##### 4.4.6.2 Other Expenses

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

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

#### 4.4.7 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 [www.mcgill.ca/studenthealth/immunize/forms](http://www.mcgill.ca/studenthealth/immunize/forms).

#### 4.4.8 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.





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



#### **4.5.15 Graduation Honours**

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

#### **4.5.16 Scholarships, Bursaries, Prizes, and Medals**

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

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

*section 5.8: Honours Programs (Overview)*

*section 5.9: Minor Programs (Overview)*

*section 5.10: Post-Baccalaureate Certificate Programs (Overview)*

*section 5.11: Diploma Program (Undergraduate) (Overview)*

*section 5.12: Diploma in Collegial Studies (Overview)*

*section 5.13: Environmental Sciences Programs (Overview)*

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### **5.1 Internship Opportunities and Co-op Experience**

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

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

These programs are also available as honours programs for students after they have completed their U2 year if they meet the requirements. See individual programs for details.

### 5.3.1 Majors and Honours

Graduates of programs marked with an asterisk (\*) are eligible for membership in the *Ordre des agronomes du Québec* and other provincial institutes of agriculture.

- Agricultural Economics \*
- Agro-environmental Sciences \*
- Environmental Biology
- Global Food Security
- Life Sciences (Biological and Agricultural)
- Major in Environment – see *Faculties & Schools > McGill School of Environment > Undergraduate > : Major in Environment – B.Sc.(Ag.Env.Sc.) and B.Sc.*

Full program descriptions are listed at [section 6.2.1: B.Sc.\(Ag.Env.Sc.\) Major and Honours Programs](#).



**Note:** In the program description for each major is a suggested list of specializations that complement that major.

### 5.3.2 Specializations

Each specialization consists of 24 credits of courses (required and complementary) that provide a coherent package designed to prepare students for a future in a given discipline. Students will select at least one specialization. However, students wishing to broaden their training have the option of choosing to do two. Although the list of suggested specializations appears under each major in the programs section, students interested in other specializations should consult with their academic adviser.

The following are specializations for the major programs listed above in Agricultural Economics, Agro-Environmental Sciences, Environmental Biology, Global Food Security, and Life Sciences (Biological and Agricultural).

Full program descriptions are also listed at [section 6.2.2: Specializations](#).

- Agribusiness, [section 6.2.2.1: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Agribusiness \(24 credits\)](#)
- Animal Biology, [section 6.2.2.2: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Animal Biology \(24 credits\)](#)
- Animal Health and Disease, [section 6.2.2.3: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Animal Health and Disease \(24 credits\)](#)
- Animal Production, [section 6.2.2.4: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Animal Production \(24 credits\)](#)
- Applied Ecology, [section 6.2.2.5: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Applied Ecology \(24 credits\)](#)
- Ecological Agriculture, [section 6.2.2.6: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Ecological Agriculture \(24 credits\)](#)
- Environmental Economics, [section 6.2.2.7: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Environmental Economics \(24 credits\)](#)
- International Agriculture, [section 6.2.2.8: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - International Agriculture \(24 credits\)](#)
- Life Sciences (Multidisciplinary), [section 6.2.2.9: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Life Sciences \(Multidisciplinary\) \(24 credits\)](#)
- Microbiology and Molecular Biotechnology, [section 6.2.2.10: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Microbiology and Molecular Biotechnology \(24 credits\)](#)
- Plant Biology, [section 6.2.2.11: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Plant Biology \(24 credits\)](#)
- Plant Production, [section 6.2.2.12: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Plant Production \(24 credits\)](#)
- Professional Agrology, [section 6.2.2.13: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Professional Agrology \(21 credits\)](#)
- Soil and Water Resources, [section 6.2.2.14: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Soil and Water Resources \(24 credits\)](#)
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#### **5.4 Bachelor of Engineering in Bioresource Engineering – B.Eng.(Bioresource) (Overview)**

Bioresource engineering is the unique branch of engineering that includes biological engineering and bioengineering where professional engineering practice intersects with biological sciences. Bioresource engineers design, improv





- Environmental Engineering – [section 6.6.9: Minor in Environmental Engineering](#)
- Human Nutrition – [section 6.6.10: Minor Human Nutrition \(24 credits\)](#)
- International Agriculture – [section 6.6.11: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Minor International Agriculture \(24 credits\)](#)
- Environment – listed under [Faculties & Schools > McGill School of Environment > Undergraduate > Minor in Environment > : Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) or Bachelor of Science \(B.Sc.\) - Minor Environment \(18 credits\)](#)
- Some minors of interest to FAES students can also be found at : [Minors for Non-Management Students](#) – listed under [Faculties & Schools > Desautels Faculty of Management](#)

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## 5.10 Post-Baccalaureate Certificate Programs (Overview)

The Faculty offers the following post-baccalaureate certificate programs.

### Post-Baccalaureate Certificate Programs

- Ecological Agriculture
- Food Science

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

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## 5.11 Diploma Program (Undergraduate) (Overview)

Diploma Pr

The advanced courses of study offered lead to the degrees of Master of Science, Master of Science Applied, Doctor of Philosophy, Graduate Certificate in Biotechnology, and Graduate Certificate in Integrated Water Resources Management (IWRM).

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

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

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## 6 Academic Programs

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

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

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### 6.1 Freshman Major

#### Program Director

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

The Freshman 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 Freshman year consists of at least 30 credits in Fundamental Math and Science courses as 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, or McGill Placement examinations may receive exemption and/or credit for all or part of the Basic Science courses in biology, chemistry, physics, and mathematics. Similarly, students who have completed courses at other universities or colleges may receive exemptions and/or credits. Students should consult with the Faculty's Student Affairs Office. Afheloaster of Scie 1 353.731 597.315 Tm(Agricult2 B.7who0 11421395(0 1 531.97 563.wshi00.80 11421395(1

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

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

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

#### **Elective - Winter (3 credits)**

#### **B.Sc. (Ag. & Env. Sci.) - Agricultural Economics Major - Freshman Program (30 credits)**

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

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

Freshman Adviser: Dr. Alice Cherestes

Macdonald-Stewart Building, Room 1-023

Telephone: 514-398-7980

#### **Required Courses - Fall (14 credits)**

AECH 110	(4)	General Chemistry 1
AEMA 101	(3)	Calculus 1
AEPH 112	(4)	Introductory Physics 1
AGEC 200**	(3)	Principles of Microeconomics

#### **Required Courses - Winter (10 credits)**

AEBI 122	(3)	Cell Biology
AEHM 205	(3)	Science Literacy
AEMA 102	(4)	Calculus 2

#### **Complement8e43e800ice Cherestes**

Advising Notes:

\* Freshman students intending to major in Agricultural Economics in the B.Sc. (Ag. & Env. Sci.) degree program should note that the courses AEBI 120 (General Biology), AECH 111 (General Chemistry 2), and AEPH 114 (Introductory Physics 2) are required for all other majors in the B.Sc. (Ag. & Env. Sci.) degree. Students who are uncertain about their choice of major should be completing the "regular" Agricultural & Environmental Sciences Freshman program; the AGEC 200/201 courses would then be taken as part of the "regular" U1 curriculum should they ultimately decide on the Agricultural Economics Major.

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

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

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

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

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

For information on academic advising, see: <http://www.General Biolo01> may recommend that you re( Maj.1.2



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

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

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

### Required Courses - Fall (14.5 credits)

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

### Required Courses - Winter (15.5 credits)

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

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

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

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

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

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

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

Program Director: Professor John Henning

#### Program Prerequisites

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

#### Required Courses (33 credits)

AGEC 200	(3)	Principles of Microeconomics
AGEC 201	(3)	Principles of Macroeconomics
AGEC 231	(3)	Economic Systems of Agriculture
AGEC 320	(3)	Intermediate Microeconomic Theory
AGEC 330	(3)	Agriculture and Food Markets
AGEC 333	(3)	Resource Economics
AGEC 425	(3)	Applied Econometrics

AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
AGEC 491	(3)	Research & Methodology
ENVB 210	(3)	The Biophysical Environment

**Complementary Courses (9 credits)**

With the approval of the Academic Adviser

AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
AGEC 491	(3)	Research & Methodology
ENVB 210	(3)	The Biophysical Environment

### 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 "Academic Programs" > "Bachelor of Science (Agricultural and Environmental Sciences) - B.Sc.(Ag.Env.Sc.)" > "Specializations" in this eCalendar.

### Electives

To meet the minimum credit requirement for the degree.

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

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

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

Program Director: Professor Roger Cue



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

### Program Prerequisites

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

### Required Courses (36 credits)

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

### Complementary Courses (6 credits)

6 credits of complementary courses selected as follows:

One of:

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

One of:

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

### Specialization

Choose at least one specialization of 18-24 credits.

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

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

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

### Electives

To meet the minimum credit requirement for the degree.

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

Program Director: Professor Roger Cue

Students can use their electives to complete the Honours program.

**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 project courses and 6 credits in 400- or 500-level courses, from the F

ENVB 410	(3)	Ecosystem Ecology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1

**Complementary Courses (12 credits)**

12 credits of complementary courses selected from:

ENTO 330	(3)	Insect Biology
ENVB 301	(3)	Meteorology
ENVB 305	(3)	Population & Community Ecology
ENVB 313	(3)	Phylogeny and Biogeography
ENVB 430	(3)	GIS for Natural Resource Management
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

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 (30 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 410	(3)	Ecosystem Ecology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1

### Complementary Courses (24 credits)

12 credits from the following:

ENTO 330	(3)	Insect Biology
ENVB 301	(3)	Meteorology
ENVB 305	(3)	Population & Community Ecology
ENVB 313	(3)	Phylogeny and Biogeography
ENVB 430	(3)	GIS for Natural Resource Management
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

### Honours Courses

12 credits of Honours Plan A or Plan B:





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
FDESC 310	(3)	Post Harvest Fruit and Vegetable Technology
NRSC 221	(3)	Environment and Health
NUTR 501	(3)	Nutrition in Developing Countries
PLNT 300	(3)	Cropping Systems
PLNT 435	(3)	Plant Breeding
SOIL 315	(3)	Soil Nutrient Management
SOIL 326	(3)	Soils in a Changing Environment

### Honours Courses

12 credits of Honours 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

OR

#### 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



**Specialization (24 credits)**

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

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

The Life Sciences (Biological and

LSCI 451	(3)	Research Project 1
LSCI 452	(3)	Research Project 2
MICR 331	(3)	Microbial Ecology
MICR 338	(3)	Bacterial Molecular Genetics
MICR 341	(3)	Mechanisms of Pathogenicity
MICR 450	(3)	Environmental Microbiology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
PLNT 304	(3)	Biology of Fungi
PLNT 353	(3)	Plant Structure and Function
PLNT 426	(3)	Plant Ecophysiology
PLNT 435	(3)	Plant Breeding
WILD 424	(3)	Parasitology

### Specialization

At least one specialization of 18-24 credits from:

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

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

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

### Electives

To meet the minimum credit requirement for the degree.

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

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

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

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

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

**Complementary Courses (9 credits)**

9 credits of the complementary courses selected from:

ANSC 234	(3)	Biochemistry 2
ANSC 250	(3)	Principles of Animal Science
ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
	(3)	Fundamentals of Population Genetics

- Animal Health and Disease

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

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

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

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

**Required Courses (24 credits)****Revision, April 2015. Start of revision.**

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

**Revision, April 2015. End of revision.****6.2.2.5 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Applied Ecology (24 credits)**

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

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

**Required Courses (12 credits)**

ENVB 305	(3)	Population & Community Ecology
ENVB 415	(3)	Ecosystem Management
ENVB 430	(3)	GIS for Natural Resource Management
ENVB 437	(3)	Assessing Environmental Impact

**Complementary Courses (12 credits)**

12 credits selected from the following:

AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 435	(3)	Soil and Water Quality Management
BREE 327	(3)	Bio-Environmental Engineering
ENTO 440	(3)	Insect Diversity
ENVB 301	(3)	Meteorology
ENVB 506	(3)	Quantitative Methods: Ecology
MICR 331	(3)	Microbial Ecology
MICR 450	(3)	Environmental Microbiology
PLNT 304	(3)	Biology of Fungi
PLNT 426	(3)	Plant Ecophysiology

PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
SOIL 326	(3)	Soils in a Changing Environment
SOIL 535	(3)	Ecological Soil Management
WILD 302	(3)	Fish Ecology
WILD 307	(3)	Natural History of Vertebrates
WILD 350	(3)	Mammalogy
WILD 420	(3)	Ornithology

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

This specialization focuses on the principles underlying the practice of ecological agriculture. When coupled with the Major in Environmental Biology, agriculture as a managed ecosystem that responds to the laws of community ecology is examined; when combined with the Major Agro-Environmental Sciences and the specialization in Professional Agrology, this specialization focuses more directly on the practice of ecological agriculture and conforms with the eligibility requirements of the Ordre des agronomes du Québec. It is suitable for students wishing to farm and do extension and government work, and those intending to pursue postgraduate work in this field.

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

#### 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)	Ecological Soil Management

#### Complementary Courses (12 credits)

Minimum of 6 agronomic credits from:

AGRI 310	(3)	Internship in Agriculture/Environment
AGRI 435	(3)	Soil and Water Quality Management
ANSC 312	(3)	Animal Health and Disease
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 434	(3)	Weed Biology and Control
SOIL 326	(3)	Soils in a Changing Environment

Other complementary courses:

AGRI 411	(3)	Global Issues on Development, Food and Agriculture
MICR 331	(3)	Microbial Ecology
NUTR 341	(3)	Global Food Security
PLNT 460	(3)	Plant Ecology
WOOD 441	(3)	Integrated Forest Management

**6.2.2.7 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 development. It is designed



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
		Nutrition in Dev

ENTO 352	(3)	Biocontrol of Pest Insects
ENTO 440	(3)	Insect Diversity
ENTO 535	(3)	Aquatic Entomology
ENVB 301	(3)	Meteorology
ENVB 305	(3)	Population & Community Ecology
ENVB 313	(3)	Phylogeny and Biogeography
ENVB 315	(3)	Science of Inland Waters
ENVB 430	(3)	GIS for Natural Resource Management
ENVB 506	(3)	Quantitative Methods: Ecology
		Food MicroQuantitati



## Plant Pathology

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

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

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

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

#### Required Courses (15 credits)

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

#### Complementary Courses (9 credits)

\* Note: Students may take BREE 430 or ENVB 430, but not both.

BREE 322	(3)	Organic Waste Management
BREE 327	(3)	Bio-Environmental Engineering
BREE 430*	(3)	GIS for Natural Resource Management
BREE 510*	(3)	Watershed Systems Management
ENVB 430*	(3)	GIS for Natural Resource Management
NRSC 333	(3)	Pollution and Bioremediation
SOIL 300	(3)	Geosystems
SOIL 510	(3)	Environmental Soil Chemistry

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

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

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

**Required Courses (10 credits)**

PLNT 358	(3)	Flowering Plant Diversity
WILD 307	(3)	Natural History of Vertebrates
WILD 401	(4)	Fisheries and Wildlife Management

**Complementary Courses (14 credits)**

14 credits of complementary courses selected as follows:

At least 6 credits from the following:

BIOL 427	(3)	Herpetology
WILD 302	(3)	Fish Ecology
		Mammalogy

BREE 451	(1)	Undergraduate Seminar 1 - Oral Presentation
BREE 452	(1)	Undergraduate Seminar 2 Poster Presentation
BREE 453	(1)	Undergraduate Seminar 3 - Scientific Writing
BREE 485	(1)	Senior Undergraduate Seminar 1
BREE 490	(3)	Engineering Design 2
BREE 495	(3)	Engineering Design 3
ECSE 461	(3)	Electric Machinery
FACC 300	(3)	Engineering Economy
FACC 400	(1)	Engineering Professional Practice
MECH 289	(3)	Design Graphics

### **Complementary Courses**

57 credits of the complementary courses selected as follow:

6 credits - Set A

9 credits - Set B (Natural Sciences and Mathematics)

9 credits - Set C (Social Sciences)

33 credits - Set D (Engineering)

#### **Set A**

3 credits from the following:

AEMA 310	(3)	Statistical Methods 1
CIVE 302	(3)	Probabilistic Systems
MATH 323	(3)	Probability

3 credits from the following:

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

#### **Set B - Natural Sciences and Mathematics**

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

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2

CIVE 469	(3)	Infrastructure and Society
ENVR 201	(3)	Society, Environment and Sustainability
MIME 308	(3)	Social Impact of Technology
SOCI 235	(3)	Technology and Society

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

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

A suggestion in the Social Sciences offered in the department is BREE 503 Water: Society, Law & Policy.

#### **Set D - Engineering**

33 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



### **6.3.2 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Honours Bioresource Engineering (113 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 involv



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**

36 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 315	(3)	Design of Machines
BREE 322	(3)	Organic Waste Management
BREE 325	(3)	Food Process Engineering

**Required Courses (59 credits)**

AEMA 202	(3)	Intermediate Calculus
AEMA 305	(3)	Differential Equations
AGRI 330	(1)	Agricultural Legislation
AGRI 430	(2)	Professional Practice in Agrology
BREE 205	(3)	Engineering Design 1
BREE 210	(3)	Mechanical Analysis & Design
BREE 216	(3)	Bioresource Engineering Materials
		Compnterials

MECH 346 (3) Heat Transfer

### Set B - Natural Sciences

6 credits from each of the following two groups:

#### Group 1 - Biology

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

#### Group 2 - Agricultural Sciences

AEBI 210 (3) Organisms 1  
ANSC 250 (3) Principles of Animal Science  
ANSC 433 (3) Animal Nutrition and Metabolism  
ANSC 451 (3) Dairy and Beef Production Management  
ANSC 458 (3) Swine and Poultry Production  
PLNT 203 (3) Economic Botany  
PLNT 300 (3) Cropping Systems  
PLNT 302 (3) Forage Crops and Pastures  
PLNT 307 (3) Agroecology of Vegetables and Fruits  
PLNT 312 (3) Urban Horticulture  
PLNT 322 (3) Greenhouse Management

### Set C - Social Sciences

3 credits from the following list:

CHEE 230 (3) Environmental Aspects of Technology  
CIVE 469 (3) Infrastructure and Society  
ENVR 201 (3) Society, Environment and Sustainability  
MIME 308 (3) Social Impact of Technology  
SOC1 235 (3) Technology and Society

Plus one 3-credit Social Sciences, Management Studies, Humanities, Law, or Language course with permission of the Academic Adviser.

A suggestion in the Social Sciences offered in the department is BREE 503 Water: Society, Law & Policy.

### Set D - Engineering

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

(Minimum of 6 credits from Group 1 or Group 2 below.)

#### Group 1 - Soil and Water

BREE 214 (3) Geomatics  
BREE 217 (3) Hydrology and Water Resources  
(3) Organic Waste Management

BREE 416	(3)	Engineering for Land Development
BREE 418	(3)	Soil Mechanics and Foundations
BREE 430	(3)	GIS for Natural Resource Management
BREE 509	(3)	Hydrologic Systems and Modelling
BREE 510	(3)	Watershed Systems Management
BREE 515	(3)	Soil Hydrologic Modelling
BREE 518	(3)	Bio-Treatment of Wastes
BREE 533	(3)	Water Quality Management

#### **Group 2 - Food Processing**

BREE 325	(3)	Food Process Engineering
BREE 519	(3)	Advanced Food Engineering
BREE 520	(3)	Food, Fibre and Fuel Elements
BREE 530	(3)	Fermentation Engineering
BREE 531	(3)	Post-Harvest Drying
BREE 532	(3)	Post-Harvest Storage
BREE 535	(3)	Food Safety Engineering
CHEE 474	(3)	Biochemical Engineering

#### **Group 3 - Other Engineering**

BREE 314	(3)	Agri-Food Buildings
BREE 315	(3)	Design of Machines
BREE 412	(3)	Machinery Systems Engineering
BREE 423	(3)	Biological Material Properties
BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 504	(3)	Instrumentation and Control
BREE 522	(3)	Bio-Based Polymers
CIVE 317	(3)	Structural Engineering 1
CIVE 318	(3)	Structural Engineering 2

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

#### **6.3.4.1 Minor in Environmental Engineering**

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

#### **6.3.4.2 Barbados Field Study Semester**

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

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

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

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

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

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

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

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

#### Required Courses (51 credits)

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

AEMA 310	(3)	Statistical Methods 1
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
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

### **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.

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

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

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

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**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. (F 420961 or S F 0 1 277.84603)

FDSC 251	(3)	Food Chemistry 1
FDSC 300	(3)	Principles of Food Analysis 1
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
FDSC 319	(3)	Food Commodities
FDSC 330	(3)	Food Processing
FDSC 400	(3)	Food Packaging
FDSC 442	(3)	Food Microbiology
FDSC 495D1	(1.5)	Food Science Seminar
FDSC 495D2	(1.5)	Food Science Seminar
FDSC 525	(3)	Food Quality Assurance
FDSC 540	(3)	Sensory Evaluation of Foods
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health

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

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

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

### **Electives (6 credits)**

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

### **About the Concurrent Bac**

Refer to "Faculty Information and Re

At least 9 credits from the following:

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

12 credits from the following:

FDSC 480	(12)	Industrial Stage/Food
NUTR 480	(12)	Industrial Stage/Nutrition

#### **Elective Courses (12 credits)**

Electives are selected in consultation with an academic adviser.

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

Students can use their electives to complete the Honours program. The courses credited to the Honours program must be in addition to any required or

FDSC 315	(3)	Separation Techniques in Food Analysis I
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)	Human Nutrition
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1
NUTR 497	(1.5)	Professional Seminar: Nutrition
NUTR 512	(3)	Herbs, Foods and Phytochemicals

### 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 (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)	Agriculture Business Management

At least 9 credits from the following:

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

12 credits from the following:

FDSC 480	(12)	Industrial Stage/Food
NUTR 480	(12)	Industrial Stage/Nutrition

### **Elective Courses (12 credits)**

Electives are selected in consultation with an academic adviser.

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

### **6.4.5.1 Certificate in Food Science**

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

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

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

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

The Major Dietetics, which includes a 40-week internship (Stage) as part of its degree requirements, is a professional program that leads to eligibility for membership in a provincial regulatory body and registration as a professional Dietitian/Nutritionist (R.D. or p.dt). Graduates are qualified for challenging professional and leadership positions related to food and health, as dietitians, nutritionists, and food administrators. The designations "Dietitian" and "Nutritionist" are reserved titles associated with reserved acts in the province of Quebec. As clinical dietitians/nutritionists, dietitians may work in healthcare settings, nutrition counselling centres, clinics, and private practice. As community nutritionists, dietitians are involved in nutrition education programs through community health programs, school boards, and local and international health agencies. The dietitian in the food service sector participates in all aspects of management to assure quality food products and services. Postgraduate programs are available to qualified graduates. The duration of the program is 3.5 years, with the 40 weeks of supervised internship (Stage) integrated into each year in a planned sequence. Successful graduates are qualified to apply for membership with the Ordre professionnel des diététistes du Québec (O.P.D.Q.) and/or other provincial regulatory bodies, as well as Dietitians of Canada.

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

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

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

The School firmly applies prerequisite requirements for registration in all required courses in the Dietetics Major. All required and complementary courses must be passed with a minimum grade of C. 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. Successful completion of each rotation of each level of Stage (Professional Practice) is required to pass that level of Stage. Each level is a prerequisite for the next level and must be passed with a minimum grade of C. If a student fails one level of Stage, certain conditions may apply to have the option to repeat the failed level (see Stage manuals for more detailed policies and procedures). Students are reminded that ethical conduct on Professional Practice (Stage) rotations is required. The Faculty reserves the right to require the withdrawal of any student if at any time the Faculty feels the student has displayed unprofessional conduct or demonstrates incompetence.

### **Required Courses (106 credits)**

Required courses and Professional Practice (Stage) courses are sequenced in a specific order over nine terms (3.5-year program). See <http://www.mcgill.ca/nutrition> for detailed information regarding the undergraduate program plan.

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 208*	(2)	Professional Practice Stage 1A
NUTR 209*	(2)	Professional Practice Stage 1B
NUTR 214	(4)	Food Fundamentals
NUTR 217	(4)	Application: Food Fundamentals
NUTR 307	(3)	Human Nutrition
NUTR 310*	(1)	Professional Practice Stage 2A
NUTR 311*	(5)	Professional Practice Stage 2B
NUTR 322	(3)	Applied Sciences Communication
NUTR 337	(3)	Nutrition Through Life
NUTR 341	(3)	Global Food Security
NUTR 343	(3)	Accounting and Cost Control
NUTR 344	(4)	Clinical Nutrition 1
NUTR 345	(4)	Food Service Systems Management
NUTR 346	(2)	Quantity Food Production
NUTR 403	(3)	Nutrition in Society
NUTR 408*	(1)	Professional Practice Stage 3A
NUTR 409*	(8)	Professional Practice Stage 3B
NUTR 438	(2)	Interviewing and Counselling
NUTR 446	(3)	Applied Human Resources
NUTR 450	(3)	Research Methods: Human Nutrition
NUTR 510*	(14)	Professional Practice - Stage 4
NUTR 545	(5)	Clinical Nutrition 2
NUTR 546	(3)	Advanced Clinical Nutrition 3

### Complementary Courses (3 credits)

NUTR 301	(3)	Psychology
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Or the equivalent from another faculty

### Elective Courses (6 credits)

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

AEHM 300	(3)	ESL: High Intermediate 1
AEHM 301	(3)	ESL: High Intermediate 2

AEHM 330	(3)	Academic and Scientific Writing
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 503	(3)	Bioenergetics and the Lifespan Herbs, Foods and Phytochemicals



ANSC 560	(3)	Biology of Lactation
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 511	(3)	Nutrition and Behaviour
NUTR 545	(5)	Clinical Nutrition 2

At least 9 credits from the following courses:

AGRI 510	(3)	Professional Practice
ANSC 350	(3)	Food-Borne Pathogens
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 405	(3)	Food Product Development
FDSC 442	(3)	Food Microbiology
FDSC 516	(3)	Flavour Chemistry
FDSC 520	(3)	Biophysical Chemistry of Food
FDSC 525	(3)	Food Quality Assurance
FDSC 535	(3)	Food Biotechnology
FDSC 537	(3)	Nutraceutical Chemistry
FDSC 540	(3)	Sensory Evaluation of Foods
NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1

### **Elective Courses (16 credits)**

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

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

This Major covers many aspects of human nutrition and food and their impact on health and society at the community and international level. It offers a core emphasis on act o405

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

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**Elective Courses (16 credits)**

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

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

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

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

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

**Required Courses (62 credits)**

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

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 307	(3)	Human Nutrition
NUTR 322	(3)	Applied Sciences Communication
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1
NUTR 450	(3)	Research Methods: Human Nutrition
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data
PARA 438	(3)	Immunology

**Complementary Courses (12 credits)**

12 credits of complementary courses are selected as follows:

At least 3 credits from the following:

ANSC 560	(3)	Biology of Lactation
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 511	(3)	Nutrition and Behaviour
NUTR 545	(5)	Clinical Nutrition 2

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
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 & Hormones
PHGY 312	(3)	Respiratory, Renal, & Cardiovascular Physiology
PHGY 313	(3)	Blood, Gastrointestinal, & Immune Systems Physiology
WILD 424	(3)	Parasitology

#### **Elective Courses (16 credits)**

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

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

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

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

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

#### **Required Cour**

NUTR 214	(4)	Food Fundamentals
NUTR 307	(3)	Human Nutrition

### 6.5.6 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 (62 credits)

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

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 307	(3)	Human Nutrition
NUTR 322	(3)	Applied Sciences Communication
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1
NUTR 450	(3)	Research Methods: Human Nutrition
NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data

#### Complementary Courses (12 credits)

12 credits of complementary courses are selected as follows:

At least 3 credits from the following:

ANSC 560	(3)	Biology of Lactation
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 511	(3)	Nutrition and Behaviour
NUTR 545	(5)	Clinical Nutrition 2

At least 9 credits from:

ANAT 214	(3)	Systemic Human Anatomy
EDKP 330	(3)	Physical Activity and Health

EDKP 395	(3)	Exercise Physiology
EDKP 444	(3)	Ergonomics
EDKP 445	(3)	Exercise Metabolism
EDKP 446	(3)	Physical Activity and Ageing
EDKP 448	(3)	Exercise and Health Psychology
EDKP 449	(3)	Exercise Pathophysiology 2
EDKP 485	(3)	Exercise Pathophysiology 1
EDKP 495	(3)	Scientific Principles of Training
EDKP 542	(3)	Environmental Exercise Physiology
NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1

### **Elective Courses (16 credits)**

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

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

### **6.5.7.1 Minor in Human Nutrition**

Detailed information on this Minor can be found under [section 6.6.10: Minor Human Nutrition \(24 credits\)](#) in this publication.

### **6.5.7.2 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 6.4.4.1: Concurrent Bachelor of Science in Food Science \(B.Sc.\(F.Sc.\)\) and Bachelor of Science Nutritional Sciences \(B.Sc.\(Nutr.Sc.\)\) - Food Science/Nutritional Science Major \(Concurrent\) \(122 credits\)](#) in this publication.

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## **6.6 Minor Programs**

The Faculty of Agricultural and Environmental Sciences offers a number of minor programs; the following are offered by the FAES Dean's Office, or in partnership with another school or faculty.

For a full list of minors offered by the Faculty of Agricultural and Environmental Sciences, refer to [section 5.9: Minor Programs \(Overview\)](#). For registration information, see [section 4.5.8.1: Procedures for Minor Programs](#).

### **6.6.1 Minor in Environment (McGill School of Environment)**

For information about the Minor in Environment, consult [McGill School of Environment > Undergraduate > Academic Programs > : Minor in Environment](#).

### **6.6.2 Minor Agribusiness Entrepreneurship (18 credits)**

This minor program is open to B.Sc.(Ag.Env.Sc.), B.Eng.(Bioresource), and B.Sc.(F.Sc.) degree students.

The Minor in Agribusiness Entrepreneurship is designed to provide students with an understanding of the key concepts and processes involved in starting and managing new ventures in an agricultural or food business, including conceptualization, development and management of successful new ventures. It combines rigour with relevance as all students will complete a major project in the agri-food industry, thus providing an opportunity to apply the concepts acquired in the classroom. The minor is multidisciplinary and integrative, as it includes courses from across areas in the Faculties of Management and Agricultural and Environmental Sciences. The minor is appropriate for students interested in a wide variety of new ventures, from for-profit private companies to social enterprises and cooperatives.

The minimum requirement for entry into the minor is that a student be in his or her U2 year and have a CPGA of 3.0. The minor is limited to 25 students

FAES 310	(3)	Agribusiness Entrepreneurship
INTG 201	(3)	Integrated Management Essentials 1
INTG 202	(3)	Integrated Management Essentials 2
MGPO 362	(3)	Fundamentals of Entrepreneurship



**6.6.4 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

ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 420	(3)	Animal Biotechnology

Revision, April 2015. End of revision.

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

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

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

To obtain a Minor in Applied Ecology, students must:

- a) Ensure all required and complementary courses are passed with a minimum grade of C;
- b) Select 24 credits from the courses as given below, of which not more than 6 credits may be counted toward the Major and the Minor programs. This restriction does not apply to elective courses in the Major program.

#### Required Courses (12 credits)

ENVB 305	(3)	Population & Community Ecology
ENVB 415	(3)	Ecosystem Management
ENVB 430	(3)	GIS for Natural Resource Management
ENVB 437	(3)	Assessing Environmental Impact

#### Complementary Courses (12 credits)

12 credits of complementary courses selected as follows:

AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 435	(3)	Soil and Water Quality Management
ENTO 440	(3)	Insect Diversity
ENVB 301	(3)	Meteorology
ENVB 506	(3)	Quantitative Methods: Ecology
MICR 331	(3)	Microbial Ecology
MICR 450	(3)	Environmental Microbiology
PLNT 304	(3)	Biology of Fungi
PLNT 426	(3)	Plant Ecophysiology
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
SOIL 326	(3)	Soils in a Changing Environment
WILD 302	(3)	Fish Ecology
WILD 307	(3)	Natural History of Vertebrates
WILD 350	(3)	Mammalogy
WILD 420	(3)	Ornithology

### 6.6.8 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. With the agreement of their Major program adviser they must submit their program of courses already taken, and to be taken, to the Academic Adviser of the Minor. The Academic Adviser of the Minor will then certify which courses the student will apply toward the Minor and confirm that the student's program conforms with its requirements.

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

### General Regulations

To obtain a Minor in Ecological Agriculture, 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)

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

### Complementary Courses (12 credits)

Minimum of 6 agronomic credits from:

AGRI 310	(3)	Internship in Agriculture/Environment
AGRI 435	(3)	Soil and Water Quality Management
ANSC 312	(3)	Animal Health and Disease
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 434	(3)	Weed Biology and Control
SOIL 326	(3)	Soils in a Changing Environment

Other complementary courses:

AGRI 411	(3)	Global Issues on Development, Food and Agriculture
MICR 331	(3)	Microbial Ecology
NUTR 341	(3)	Global Food Security
PLNT 460	(3)	Plant Ecology
WOOD 441	(3)	Integrated Forest Management

## 6.6.9 Minor in Environmental Engineering

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

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

### Courses available in the Faculty of Agricultural and Environmental Sciences (partial listing):

BREE 217	Hydrology and Water Resources
BREE 322	Organic Waste Management

**Courses available in the Faculty of Agricultural and Environmental Sciences (partial listing):**

BREE 416	Engineering for Land Development
BREE 518	Bio-Treatment of Wastes
MICR 331	Microbial Ecology

For academic advising, please consult [www.mcgill.ca/macdonald/studentinfo/advising](http://www.mcgill.ca/macdonald/studentinfo/advising).

**6.6.10 Minor Human Nutrition (24 credits)**

**Revision, April 2015. Start of revision.**

The Minor Human Nutrition is intended to complement a student's primary field of study by providing a focused introduction to the metabolic aspects of human nutrition. It is particularly accessible to students in Biochemistry, Biology, Physiology, Anatomy and Cell Biology, Microbiology and Immunology, Animal Science, or Food Science programs. The completion of 24 credits is required, of which at least 18 must not ov

NUTR 436	(2)	Nutritional Assessment
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data
PATH 300	(3)	Human Disease

3 credits from:

MIMM 314	(3)	Intermediate Immunology
PARA 438	(3)	Immunology

3 credits from:

NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1
NUTR 431	(3)	Directed Studies: Dietetics and Nutrition 2

**Revision, April 2015. End of revision.**

#### **6.6.11 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. 81 1 0 0 1 196.237 432.942 445.6End

PARA 515	(3)	Water, Health and Sanitation
PLNT 300	(3)	Cropping Systems

### **Option B**

15 credits from any of the McGill Field Study Semesters:

African Field Study Semester

Barbados Field Study Semester

Barbados Interdisciplinary Tropical Studies Field Semester

Panama Field Study Semester

Plus 3 credits from the list in Option A

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## **6.7 Post-Baccalaureate Certificate Programs**

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

### **6.7.1 Certificate in 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.

ENVB 415	(3)	Ecosystem Management
MICR 331	(3)	Microbial Ecology
NUTR 341	(3)	Global Food Security
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits
PLNT 434	(3)	Weed Biology and Control
PLNT 460	(3)	Plant Ecology
SOIL 326	(3)	Soils in a Changing Environment
WILD 424	(3)	Parasitology
WOOD 441	(3)	Integrated Forest Management

### 6.7.2 Certificate in Food Science (30 credits)

The 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 field of food science and then choose complementary courses that allow a broad-based exposure in areas such as food chemistry/analysis, food microbiology/nutrition, quality assurance/safety, processing/engineering, communication skills and ethics.

#### Required Course (3 credits)

FDSC 200	(3)	Introduction to Food Science
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#### Complementary Courses (27 credits)

27 credits (select no more than two 200-level courses)

AGRI 510	(3)	Professional Practice
BREE 324	(3)	Elements of Food Engineering
BREE 535	(3)	Food Safety Engineering
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 400	(3)	Food Packaging
FDSC 405	(3)	Food Product Development
FDSC 442	(3)	Food Microbiology
FDSC 495D1	(1.5)	Food Science Seminar
FDSC 495D2	(1.5)	Food Science Seminar
FDSC 515	(3)	Enzymology
FDSC 516	(3)	Flavour Chemistry
FDSC 519	(3)	Advanced Food Processing
FDSC 520	(3)	Biophysical Chemistry of Food
FDSC 525	(3)	Food Quality Assurance
FDSC 535	(3)	Food Biotechnology





**Associate Director**

Serge Lussier; B.Sc.(Agr.)(McG.)

**Faculty Lecturers**

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

Christian Molgat; B.Sc.(Bio.)(Ott.), B.Sc.(Agr.)(Guelph)

Pascal Thériault; B.Sc.(Agr.), M.Sc.(Kansas)

David Wees; B.Sc.(Agr)

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**

FMT4 013	(2)	Agricultural Internship (152-VSN-MC)
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**Fall 2**

Two courses selected from the Elective Production course list below.

FMT4 014	(2)	Marketing Strategies (152-VSP-MC)
FMT4 015	(1.33)	Forest Management (152-VSQ-MC)
FMT4 005	(1.33)	Animal Anatomy and Physiology
FMT4 008	(2.33)	Introduction to Animal Science (152-008-MC)
FMT4 075	(2)	Langue française et communication (602-101-03)
FMT4 082	(2.33)	Literary Genres (603-102-04)
FMT4 085	(2.33)	Humanities 1: Knowledge (345-103-04)

**Winter 2**

Two courses selected from the Elective Production course list below.

FMT4 016	(2)	Budgeting and Administration (152-VSR-MC)
FMT4 017	(1.33)	Agricultural Systems (152-VST-MC)
FMT4 083	(2.33)	Literary Themes (603-103-04)
FMT4 091	(1)	Physical Activity and Effectiveness (109-102-MQ)
FMT4 098	(2)	Français agricole (602-VSG-MC)

**Summer 2**

FMT4 018	(2.33)	Enterprise Management 1 (152-VSU-MC)
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**Fall 3**

FMT4 019	(2)	Nutrient Management Plan (152-VSV-MC)
FMT4 020	(2)	Conservation of Soil and Water (152-VSW-MC)
FMT4 021	(2.67)	Enterprise Management 2 (152-VSX-MC)
FMT4 022	(1.67)	Equipment Management (152-VSY-MC)
FMT4 078	(2)	FMT English (603-VSB-MC)
FMT4 086	(2)	Humanities 2: World Views (345-102-03)
FMT4 097	(2)	Landscape Design (504-VSG-MC)

**Winter 3**

FMT4 023	(1.33)	Building Management (152-VSZ-MC)
FMT4 024	(1.67)	Farm Building Development (152-VTA-MC)
FMT4 025	(2.33)	Enterprise Management 3 (152-VTB-MC)

FMT4 026	(1.67)	Human Resources (152-VTC-MC)
FMT4 027	(1.33)	Precision Agriculture (152-VTD-MC)
FMT4 087	(2)	Humanities 3:Env.& Org. Issues (345-VSH-MC)
FMT4 092	(1)	Physical Activity and Autonomy (109-103-MQ)

### **Elective Production Courses**

We offer four production courses in the area of Animal Science and four production courses in the area of Plant Science. Students must take a minimum of two courses in each category for a total of four courses. Students could elect to take more than four courses if they wish, after a discussion with their academic adviser. They must take a minimum of two courses per semester.

#### **Animal Science Category**

FMT4 028	(2.67)	Dairy Replacement Management (152-VTE-MC)
FMT4 029	(2.67)	Dairy Performance Management (152-VTF-MC)
FMT4 030	(2.67)	Swine and Poultry Management (152-VTG-MC)
FMT4 031	(2.67)	Beef and Sheep Management (152-VTH-MC)

#### **Plant Science Category**

FMT4 033	(2.67)	Vegetable and Fruit Crops (152-VTK-MC)
FMT4 034	(2.67)	Greenhouse Crop Production (152-VTL-MC)
FMT4 035	(2.67)	Field Crop Management 1 (152-VTM-MC)
FMT4 036	(2.67)	Field Crop Management 2 (152-VTN-MC)

#### **Complementary Courses\***

Students must take two complementary courses to meet the program requirements. The program offers the following. A second mentar 1F2.

- Secondary V Language of Instruction
- Secondary V Second Language

3. The minimum entrance requirements for **students from Ontario** are the Ontario Secondary School Di

## 7.6.5 Institutional Policy on the Evaluation of Student Achievement – FMT

The policy has the following objectives:

- to establish and explain the principles followed in evaluating student learning;
- to describe the means of translating these principles into practice and to establish the required procedures;
- to articulate the appropriate responsibilities of students, instructors, departments, and academic administrators;
- to account to students, parents, universities, and employers for the standards of learning at the campus;
- to create an environment of awareness and free discussion of pedagogical concerns within all segments of the campus community;
- to provide information that will allow students to more fully understand and participate in the educational process;
- to provide the framework within which instructors and academic administrators can exercise their professional judgment in a competent, just, and coherent fashion.

Copies are available in the Library and students are informed of it at registration.

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## 7.7 Fees and Expenses – FMT

### 7.7.1 Fees

Tuition fees for all full-time students who are eligible for the Farm Management and Technology program are paid by the *Minist re de l'Agriculture, des P cheries et de l'Alimentation du Qu bec*. Student Services and Student Societies' fees, as well as course material fees, will be charged according to the schedule in effect for all Macdonald campus students. At the time of publishing, the fees\* were \$948.88 for the Fall semester, and \$697.86 for the Winter semester for Quebec residents. Additional fees may apply to out-of-province students.

\* 2014–2015 fees, subject to change without notice.

### 7.7.2 Textbooks and Supplies

The cost of textbooks and supplies is estimated at \$250.00 per semester.

### 7.7.3 Financial Assistance

In-Course Financial Aid (including loans and bursaries) is available to full-time students on the basis of demonstrated financial need; however, it is recommended that all applicants apply for the maximum government student assistance program for which they are eligible. Students may apply for In-Course Financial Aid through the *Financial Aid & Awards Menu* on Minerva and will then be asked to make an appointment with the Financial Aid Counsellor at the Macdonald Student Service Centre. For more information, consult [199.213.323.80](tel:199.213.323.80) or [526.664.352.963](tel:526.664.352.963) Tm6. [\\$697.86 A34at9alG/F2 8.1 u48 333.5](mailto:ammd.Suity.Nciknd)

## 8.2 About the Department of Animal Science

There are excellent programs available for those students interested in the study of animal science at the undergraduate level. Whether students are interested in the improvement of livestock production from the point of view of nutrition, breeding and reproduction, or the study of animals in a health context, or even the biotechnology aspects that provide a basis for further laboratory research and an opening to animal models and their impact on human health and disease, there is a specialization that will appeal to those needs.

The Department of Animal Science plays a crucial role in the offering of four important specializations:

- Animal Biology
- Animal Health and Disease
- Animal Production
- International Agriculture

Each of these specializations must be taken within the context of a major, depending on the orientation of a student toward





## Professors

Michael O. Ngadi; B.Eng.(Agr.Eng.), M.A.Sc., Ph.D.(Dal.Tech.)

Shiv O. Prasher; B.Tech., M.Tech.(Punj.), Ph.D.(Br. Col.), LL.D.(Dal.) (*James McGill Professor*)

G.S. Vijaya Raghavan; B.Eng.(B'lore), M.Sc.(Guelph), Ph.D.(Colo. St.), D.Sc.(TNAU), D.Sc.(UAS Dharwad) (*James McGill Professor*)

## Associate Professors

Viacheslav I. Adamchuk; B.Sc.(NULES, Kyiv), M.Sc., Ph.D.(Purd.)

Jan Adamowski; B.Eng.(RMC), M.Phil.(Camb.), M.B.A.(WUT, LBS, HEC Montr., NHH), Ph.D.(Warsaw)

Grant Clark; B.Sc.(Alta.), M.Sc., Ph.D.(McG.)

Mark Lefsrud; B.Sc.(Sask.), M.Sc.(Rutg.), Ph.D.(Tenn.)

Valérie Orsat; B.Sc., M.Sc., Ph.D.(McG.)

## Assistant Professors

Marie-Josée Dumont; B.Eng, M.Sc.(Laval), Ph.D.(Alta.)

Zhiming Qi; B.Sc., M.Sc.(China Agr.), Ph.D.(Iowa)

## Adjunct Professors

Joyce I. Boye; B.Eng.(KNUST, Ghana), Ph.D.(McG.)

M. Clamen; B.Eng., Ph.D.(McG.)

Satya Dev; B.Sc.(TNAU), M.Sc., Ph.D.(McG.)

Pierre Jutras; B.Sc.(McG.), M.Sc.(Montr.), Ph.D.(McG.)

Ali Madani; B.Sc.(Pahlavi), M.Sc.(Br. Col.), Ph.D.(Wash. St.)

Arun Mujumdar; B.Eng.(Bom.), M.Eng., Ph.D.(McG.)

Marian Simpson; B.Sc.(Ghana), M.Sc.(Nfld.), Ph.D.(McG.)

Boris TartakoMcGoscTj1 0 0 1 226.221 1.365 380.nAwt.)

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

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## 10.2 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 as914O y1 to solv

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### **Emeritus Professors**

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

### **Professors**

Peter Brown; B.A.(Haver.), M.A., Ph.D.(Col.) (*joint appt. with Geography and McGill School of Environment*) – *Environmental Policy and Ethics*

James W. Fyles; B.Sc., M.Sc.(Vic., BC), Ph.D.(Alta.) (*Tomlinson Chair in Forest Ecology*) – *Forest Resources*

### **Associate Professors**

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

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

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

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

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

Brian T

Gary55 Dunphy; B.Sc.(New Br.), M.Sc., Ph 6289Nfld.) *Entomology*

John C. Henning.55 511.367 6289Guelph) –

**Affiliate Member**

Geoffrey Sunahara

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**12 Department of Plant Science**

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**12.1 Location**

Raymond Building, Room R2-019

#### Associate Professors

Danielle J. Donnelly; B.Sc.(Agr.)(McG.), M.Sc.(Br. Col.), Ph.D.(S. Fraser)

Suha Jabaji; B.Sc.(Beirut), M.Sc.(Guelph), Ph.D.(Wat.)

Ajjamada C. Kushalappa; B.Sc., M.Sc.(B' Lore), Ph.D.(Flor.)

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

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

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

Marcia J. Waterway; B.A.(Grand Rapids), M.S.(Wisc.), Ph.D.(Cornell)

#### Assistant Professors

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

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

#### Faculty Lecturers

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

Serge Lussier; B.Sc.(Agr.)(McG.)

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

#### Associate Members

Gregory Brown (*Department of Biology*)

Timothy A. Johns (*School of Dietetics and Human Nutrition*)

#### Adjunct Professors

Annick Bertrand

Bao-Luo Ma

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## 13 School of Dietetics and Human Nutrition

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### 13.1 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: 514-398-7739

Email: [nutrition.dietetics@mcgill.ca](mailto:nutrition.dietetics@mcgill.ca)

Website: [www.mcgill.ca/nutrition](http://www.mcgill.ca/nutrition)

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### 13.2 About the School of Dietetics and Human Nutrition

Health and well-being of individuals in relation to food choices prevails as the unifying theme of the programs in the School of Dietetics and Human Nutrition, a part of the McGill University Health Sciences.

The School offers a **B.Sc.(Nutr.Sc.)** in either the Dietetics Major or the Nutrition Major.

The Dietetics Major is an accredited professional program which leads to eligibility to register with a provincial dietetic regulatory body as a registered dietitian. The 3.5 year (115 credits) Dietetics Major includes 40 weeks of internship (Professional Practice - Stage) which is sequenced throughout each year of study. The program is accredited by Dietitians of Canada. Students are exposed to a variety of practice settings including clinical nutrition, community nutrition, and food service.

The B.Sc.(NutSc.) Nutrition Major is a 90-credit undergraduate degree. At its core, it deals with how diet and nutrition affect human health and disease risk. It offers you exciting opportunities to specialize in one of six concentrations, to incorporate research experience, travel or field studies, or a Minor in your program. It does not lead to professional licensure as a Dietitian/Nutritionist, but it is excellent preparation for many careers including medical school, veterinary school and other professional schools, for graduate school, or for the food, pharma or other industry, government or NGO, or global health organizations.

B.Sc.(Food.Sc.)/B.Sc.(NutSc.) The School also offers a double major the B.Sc. Food Science/Nutritional Science Major a 122-credit undergraduate degree.

**Associate Professors**

Hope WHO61m(HoA.ScJoane RouthiGuelph, Ph.M1G.0.fl 00.8431 rg0.9804 0.9216 0.8431 RG67.52 719.587ET7 1569583.82.307 156959 Tw49.587 lhf59 Tw49.587





### 13.6.3 Applicants from Other Canadian Provinces

Applicants from provinces other than Quebec and Ontario must hold:

- a high school diploma giving access to university education in their province/territory;

and must have completed:

- Grade 12 Mathematics (pre-calculus);
- two of: Grade 12 Biology, Chemistry or Physics;
- Grade 12 English or French (see note below explaining when English or French is required).

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



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

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

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

### 13.6.4 Applicants from U.S. High School Programs

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

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

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



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

### 13.6.5 Applicants from Other Countries

The normal basis for review is

### 13.6.7 Transfer Students

Students wishing to transfer from other universities and colleges are considered for admission on the basis of both their university work and previous studies. A minimum of 60 credits of work must be completed at McGill if a degree is to be granted. Students must also fulfil the requirements of a degree program. Credits are determined only once a formal application and all the necessary supporting documents are received.

Basic science requirements are:

- two semesters of biology;
- two semesters of general chemistry, with labs;
- one semester of organic chemistry;
- two semesters of physics (including mechanics, electricity and magnetism, and waves and optics), with labs;
- one semester in each of differential and integral calculus.

A grade of B or better is expected in prerequisite mathematics and science courses.

This same policy is applicable to holders of undergraduate degrees.

### 13.6.8 Transfer Students – Inter-Faculty

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

For CGPA requirements please see [www.mcgill.ca/macdonald/studentinfo/undergrads/readmission](http://www.mcgill.ca/macdonald/studentinfo/undergrads/readmission). For more information, please refer to [University Regulations and Resources](#) > Undergraduate > Registration > : [Interfaculty Transfer](#).

### 13.6.9 Mature Student Admission

Residents of Canada who will be 23 years of age or older by September 1 (for admission for the Fall session) or January 1 (for admission for the Winter session) and who lack the academic background normally required for admission may apply for entrance as mature students.

Mature students must complete all entrance math/science requirements during their first year. This may require an additional year to the program due to the availability of required courses. Individuals interested in being considered for entrance under this policy should contact the [Student Affairs Office](#) for complete details.

The first Stage course, NUTR 208 Professional Practice Stage 1A, which occurs in the Fall term of the first year, requires that all entrance prerequisite science courses (physics, calculus, chemistry, biology) are complete prior to this course.

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## 13.7 Academic Information and Regulations

### 13.7.1 Academic Standing

The program for the degree with a Major in Nutrition will normally be completed in three academic years or six semesters (following the Freshman Year, if one is required). The degree with a Major in Dietetics will normally be completed in three and one-half academic years. For the purpose of student classification, the years will be termed U1, U2 and U3.

- U1: the first 12 months following each admission to a degree program in which the student is required to complete 72 or more credits at the time of admission;
- U2: to be used for all students who are not U1 or U3.
- U3: the session in which it is expected the student will qualify to graduate.

Further information and regulations on academic standing are available at [section 4.5.5: Academic Standing](#).

#### Academic Advisers

Before registration, all students entering the Faculty must consult with the Academic Adviser of their program for selection and scheduling of required, complementary, and elective courses.

The Academic Adviser will normally continue to act in this capacity for the duration of the student's studies in the Faculty.

A Faculty Adviser is also available in the [Student Affairs Office](#) to assist students with student record related matters.

### 13.7.2 Degree Requirements

To be eligible for a B.Sc.(Nutr.Sc.), students must have passed, or achieved exemption, with a minimum C grade in all required and complementary courses of the program. They must have a CGPA of at least 2.00.

In addition, students in the Dietetics program must have completed the Professional Practice Stages of professional formation, which require a minimum CGPA of 3.00.

### **13.7.3 Minimum Credit Requirement**

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### Associate Professors

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

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

### Assistant Professors

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

Jianguo Xia; B.Sc.(Peking), M.Sc., Ph.D.(Alta.)

### Associate Members

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

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

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

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

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

### Adjunct Professors

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

John P. Dalton; B.Sc., Ph.D.(Dublin)

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

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

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## 15 Instructional Staff

### Instructional Staff

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

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

Adamowski, Ja(Bria095t(Martin O70.52Tm(CSc.u-B.Sc.(Lenoir)TjiIo.095 Tm(wski./00193.989316.ct3mTm(ofea095t(Martin Oist, )Tj1008en0001109.296 Ois)Tj

## Instructional Staff

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Charron, Jean-Benoit; B.Sc.(Montr.), M.Sc., Ph.D.(UQAM); Assistant Professor of Plant Science

Chenier, Martin R.; B.Sc., M.Sc.(Laval), Ph.D.(McG.); Assistant Professor of Food Safety

Cherestes, Alice; B.A., M.A., Ph.D.(CUNY); Senior Faculty Lecturer, Faculty of Agricultural and Environmental Sciences

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Côté, Benoît; B.Sc., Ph.D.(Laval); Associate Professor of Woodland Resources

Cue, Roger I.; B.Sc.(Newcastle, UK), Ph.D.(Edin.); Associate Professor of Animal Science

de Blois, Sylvie; B.Sc.(Agr.)(McG.), M.Sc., Ph.D.(Montr.); Associate Professor of Plant Science and Director, McGill School of Environment

Donnelly, Danielle J.; B.Sc.(Agr.)(McG.), M.Sc.(Br. Col.), Ph.D.(S. Fraser); Associate Professor of Plant Science

Driscoll, Brian T.; B.Sc., Ph.D.(McM.); Associate Professor of Microbiology

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

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

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

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Georges, Elias; B.Sc., Ph.D.(McG.); Associate Professor of Parasitology

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

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

Gray-Donald, Katherine; B.Sc., Ph.D.(McG.); Associate Professor of Human Nutrition

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

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

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

Henning, John C.; B.Sc., Ph.D.(Guelph); Associate Professor of Agricultural Economics

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## **Instructional Staff**

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Kubow, Stan; B.Sc.(McG.), M.Sc.(Tor.), Ph.D.(Guelph); Associate Professor of Dietetics and Human Nutrition

Kushalappa, Ajjamada C.; B.Sc., M.Sc.(B'lore), Ph.D.(Flor.); Associate Professor of Plant Science

**Instructional Staff**

Watson, Alan K.; B.Sc.(Agr.), M.Sc.(Br. Col.), Ph.D.(Sask.); Professor of Agronomy and Director