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

Programs, Courses and University Regulations

2013-2014

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

1 . McGill University reserves the right to mak

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5.5.11

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.

2 History of the Faculty

Dedicated to improving the quality of life in Quebec's rural communities, Sir William Christopher Macdonald founded the School of Agriculture, the School for Teachers, and the School of Household Science at Macdonald College in Sainte-Anne-de-Bellevue in 1906. Macdonald College opened its doors to students in 1907 and its first degrees were awarded in 1911. The School for Teachers became the Faculty of Education in 1965 and moved to the downtown campus in 1970. Currently the Macdonald Campus is home to the Faculty of Agricultural and Environmental Sciences, the School of Dietetics and Human Nutrition, and the Institute of Parasitology. The Faculty is comprised of the Departments of Animal Science, Bioresource Engineering, Food Science and Agricultural Chemistry, Natural Resource Sciences, and Plant Science. The Faculty is one of the founding members of the McGill School of Environment and is also home to the Farm Management and Technology Program. The current enrolment is just short of 1800 undergraduate and graduate students.

3 Macdonald Campus Facilities

3.1 Morgan Arboretum

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

3.2 Macdonald Campus Library

Located in the Barton Building, the Macdonald Campus Library provides access to leading-edge print and electronic collections, facilities, and services to support a broad range of needs. The Library's collections encompass a wide variety of print and electronic resources in the areas of agriculture, nutrition, and environmental sciences.

The Library's catalogue, research databases, McGill theses, past exams, and other online resources are accessible to you via the Library website. The Library is also a depository for many print and electronic government publications. The Library's eZone computers provide access to specialized software such as ArcGIS, SAS and EndNote. Comfortable seating, study tables, group study rooms, and a 24-hour study area are also available to you. The area is equipped for direct or wireless laptop access to the McGill network and the Internet. Laptops and ebook readers can also be borrowed.

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

More information is available at *www.mcgill.ca/library/branches/macdonald* or feel free to drop by.

3.3 Macdonald Campus Computing Centre

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

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

For more information and to search the IT Knowledge Base, visit the IT Services web page at *www.mcgill.ca/it*.

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

5 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 biotechnology, bioproducts and bioprocessing, bioinformatics, food safety and food quality, environmental engineering, water management, soils, parasitology

Director of Athletics

William R. Ellyett; B.A.(Sir G. Wms.), B.Ed.(Phys.Ed.)(McG.)

General Manager, Macdonald Campus Farm

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

Manager, Campus Housing

Ginette Legault

Supervisor, Property Maintenance

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

5.3 Faculty Admission Requirements

For information about the admission requirements for this Faculty, please refer to the *Undergraduate Admissions Guide* found at *www.mcgill.ca/applying*.

For information about inter-faculty transfers, see *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Registration > : Interfaculty Transfer*.

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

Student Affairs Office
Macdonald Campus of McGill University
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec H9X 3V9

Telephone: 514-398-7928 or 7925
Email: *studentinfo.macdonald@mcgill.ca*
Website: *www.mcgill.ca/macdonald/prospective*

More specific information on application deadlines and admission requirements can be found at *www.mcgill.ca/applying*.

5.4 Student Information

Friendly staff are on hand to answer your questions about academics, residence, athletics, student life, health concerns, and much more.

5.4.1 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*

5.4.2 Student Services

Students who study on the Macdonald campus can make full use of all McGill Student Services on both campuses. Student Services at the Macdonald campus offers the following primary services: Career Planning Service (CaPS), Counselling, Student Financial Aid, and Student Health Services. In addition, Macdonald campus Student Services offers international health insurance (Blue Cross cards), administration of mid-term exams for students registered with the Office for Students with Disabilities, and the Winter Coat Project.

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 *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Student Services > : Office of the Executive Director, Services for Students*.

For detailed information on our services, see *Programs, Courses and University Regulations > University Regulations and Resources > Undergraduate > Student Services > : Student Services – Macdonald Campus* or our website: *www.mcgill.ca/macdonald-studentservices*.

5.4.3 Macdonald Campus Residences

You can apply for residence in either of two distinctive facilities:

Laird Hall, with a capacity of 250 students, is arranged on a co-educational basis and provides single- and double-room accommodation for both undergraduate and graduate students.

The EcoResidence accommodates 100 students in apartment-style living. It offers fully furnished six-plex and two-plex apartments including individual bedrooms.

For further information, refer to *Programs, Courses and University Regulations* > *University Regulations and Resources* > *Undergraduate* > *Residential Facilities* > *: University Residences – Macdonald Campus*; *www.mcgill.ca/students/housing/macdonald* or email *residences.macdonald@mcgill.ca*.

5.4.4 Student Life

All undergraduate, postgraduate, and Farm Management and Technology students are members of the Macdonald Campus Students' Society. The MCSS, through the 18-member Students' Council, is involved in numerous campus activities such as social events, academic affairs, and the coordination of clubs and organizations. Student life is informal and friendly, and student groups range from the Outdoor Adventure Club to the Photography Society. Major social events include Frosh activities, Halloween Party, and Winter Carnival. The Ceilidh, a student-run bar located in the Centennial Centre, is open every Thursday night.

The Centennial Centre is the centre of student life, offering facilities for student activities, such as meeting rooms, club rooms, pool tables, and great places to relax, listen to music, and meet friends. Also located in the Centre are the Students' Council offices, an information desk, and the Robber's Roost Campus Bookstore.

5.4.5 Student Rights and Responsibilities

The *Handbook on Student Rights and Responsibilities* is published jointly by 561.1g328 6ed six-plegraduate, p328 62e are theuTbw9e, of

5.5 Faculty Information and Regulations

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

5.5.1 Minimum Credit Requirement

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

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

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

Students from outside Quebec who are admitted on the basis of a high school diploma enter the Freshman Major, which comprises 30 credits (see *section 7.1: Freshman Major* in this publication).

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

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

5.5.2 Minimum Grade Requirement

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

5.5.3 Academic Advisers

Upon entering the Faculty and before registering, you must consult with the academic adviser of your 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 your studies in the Faculty.

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

5.5.4 Categories of Students

5.5.4.1 Full-Time Students

Full-time students in Satisfactory Standing take a minimum of 12 credits per term. (A normal course load is considered to be 15 credits per term.)

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

5.5.4.2 Part-time Students

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

5.5.5 Academic Standing

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

The following rules apply to your Academic Standing:

1. When your CGPA (or TGPA in the first term of the program) falls below 2.00, your Academic Standing becomes Probationary.
2. If you are in Probationary Standing, you may register for no more than 14 credits per term.
3. While in Probationary standing, you must achieve a TGPA of 2.50 to continue in Probationary Standing or a CGPA of 2.00 in order to return to Satisfactory Standing. Failure to meet at least one of these conditions will result in Unsatisfactory Standing. (In the case of Fall term, this will be Interim Unsatisfactory Standing and the rules for Probationary Standing will apply.)

4. 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 have additional standards in place for the professional program (Dietetics). See *Section 7.5.4: Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Dietetics (115 credits)*.

5.5.5.1 Committee on Academic Standing

The Faculty's Committee on Academic Standing, consisting of academic staff, administrative staff, and a student representative, reviews special requests made by students regarding their academic life.

5.5.6 Credit System

The credit assigned to a particular course reflects the amount of effort it demands of you. As a guideline, a one-credit course would represent approximately 45 hours total work per course. This is, in general, a combination of lecture hours and other contact hours such as laboratory periods, tutorials, and problem periods as well as personal study hours.

Please refer to *Programs, Courses and University Regulations* > *University Regulations and Resources* > *Undergraduate* > *Student Records* > *: Credit System*.

5.5.6.1 School of Continuing Studies Courses

Not all School of Continuing Studies credit courses are recognized for credit within Faculty degree programs. Please contact the Student Affairs Office before registering for such courses.

5.5.7 Academic Credit Transfer

Transfer credits based on courses taken at other institutions (completed with a grade of C or better) before entrance to this Faculty are calculated and assigned after you are accepted, and have accepted the offer of admission.

Transfer credits may also be granted for courses taken at other institutions (completed with a grade of C or better) while you are attending McGill University. You must secure permission to apply such credits to your program in this Faculty before you begin the work. Prior Approval Forms are available in the Student Affairs Office in the Faculty. Grades obtained in such courses do not enter into calculations of grade point averages (GPA).

Exemption from a required or complementary course on the basis of work completed at another institution must be approved by both the instructor of the appropriate McGill course and the Academic Adviser.

As a full-time degree student, you may register, with approval of the Student Affairs Office, for course(s) at any university in the province of Quebec through CREPUQ. Those courses successfully completed with a minimum grade of C (according to the standards of the university giving the course) will be recognized for the purpose of your degree, but the grades obtained will not enter into your GPA calculations.

For further details, see *Programs, Courses and University Regulations* > *University Regulations and Resources* > *Undergraduate* > *Registration* > *: Quebec Inter-University Transfer Agreement: McGill Students*, or go to *www.crepuq.qc.ca* to access the online application.

5.5.8 Regulations Regarding Second Academic Majors

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

1. You must be in Satisfactory Academic Standing with a minimum CGPA of not continue 69t be in Satss the on418.926nly af511.33 242.703 Tm(Ac.543in30 1 67.52

cancel it in writing. If you want to cancel the Minor, you must notify both the Minor Adviser and the Student Affairs Office. The Minor Approval form is available on the Faculty website and in the Student Affairs Office, Laird Hall, Room 106.

5.5.9 Course Change Information

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1. Courses: please refer to *Programs, Courses and University Regulations* > *University Regulations and Resources* > *Undergraduate* > *Registration* >

If, after discussion with your instructor, you want to have a formal final examination reread, you must apply in writing to the Associate Dean (Student Affairs). The following conditions apply:

- grades may be either raised or lowered as the result of a reread;
- rereads in courses outside the Faculty of Agricultural and Environmental Sciences are subject to the deadlines, rules, and regulations of the relevant faculty.

Application for rereads must be made by March 31 for Fall term courses and by September 30 for Winter term and Summer term courses. You are assessed a fee for formal rereads. Any request to have term work re-evaluated must be made directly to the instructor concerned.

Any request to have in-course submissions reassessed must be made within 10 working days after the graded material has been made available to you.

5.5.13.2 Deferred Examinations

The Faculty offers deferred exams for medical reasons and exceptional circumstances (to be approved by the Associate Dean (Student Affairs)) for the Fall and Winter periods. V

Several programs offered by the Faculty and School lead toward professional accreditation. These include the Dietetics Major (membership in the Dietitians of Canada and the *Ordre professionnel des diététistes du Québec*); the Agricultural Economics Major and the Agro-Environmental Sciences Major (membership in the *Ordre des agronomes du Québec* and other provincial Institutes of Agriculture); Bioresource Engineering (membership as a professional engineer in any province of Canada plus the *Ordre des agronomes du Québec*); and Food Science (accreditation by the Institute of Food Technologists and professional accreditation by the *Ordre des chimistes du Québec*). Professional Practice experiences to complete the Dietetics practicum are provided in the McGill teaching hospitals and in a wide variety of health, education, business, government, and community agencies.

The Faculty also offers M.Sc. and Ph.D. programs in the areas of Agricultural Sciences, Biological Sciences, Bioresource Engineering, Biotechnology, Environmental Sciences, Food Science, and Nutritional Sciences. M.Sc.(Applied) programs are offered in some disciplines. In addition, a Graduate Certificate in Biotechnology, a Graduate Diploma in Dietitian Credentialing, a Graduate Certificate in Bioinformatics, and a Graduate Option in Environment are offered.

Programs Offered by the Faculty of Agricultural and Environmental Sciences

section 7.2: Bachelor of Science (Agricultural and Environmental Sciences) – B.Sc.(Ag.Env.Sc.)

section 7.3: Bachelor of Engineering (Bioresource) – B.Eng.(Bioresource)

section 7.4: Bachelor of Science (Food Science) - B.Sc.(F.Sc.)

section 7.5: Bachelor of Science (Nutritional Sciences) – B.Sc.(Nutr.Sc.)

section 6.7: Concurrent Bachelor of Science in Food Science – B.Sc.(F.Sc.) and Bachelor of Science in Nutritional Sciences – B.Sc.(Nutr.Sc.) (Overview)

section 6.8: Honours Programs (Overview)

section 6.9: Minor Programs (Overview)

section 6.10: Post-Baccalaureate Certificate Programs (Overview)

section 6.11: Diploma Program (Undergraduate) (Overview)

section 6.12: Diploma in Collegial Studies (Overview)

section 6.13: Environmental Sciences Programs (Overview)

6.1 Internship Opportunities and Co-op Experience

6.1.1 FAES 200 / FAES 300 Internship Program

As a full-time undergraduate student (with a CGPA of 2.9 or higher) in one of the following programs: B.Sc.(Ag.Env.Sc.), B.Sc.(F.Sc.), or B.Eng.(Bioresource), you have the opportunity to participate in the Internship program. It's a non-credit (Pass/Fail only) course, where you can intern in a place related to your field of study.

The internship should be a minimum length of 10 weeks, with the student working 35 hours a week or more. Internships allow students to gain practical, hands-on experience and develop skill sets that are frequently in high demand by employers.

6.1.2 AGRI 310 Internship in Agriculture/Environment

The objective of AGRI 310 is to give you experience working in an enterprise that is related to your field of study, and to find out how your studies can contribute to your understanding and performance in the workplace environment. Through observations of the enterprise function, the decision-making process and the economic constraints, you should obtain a better understanding of the technical, economic, and social challenges faced by enterprises working in your chosen field of study.

6.1.3 AGRI 410D1 and AGRI 410D2 Internship and Co-op Experience

As a qualified student in the B.Sc.(Ag.Env.Sc.), you have the opportunity to participate in a summer-long internship related to your field of study. If you aspire to become a professional agrologist, you will be required to complete an internship under the supervision of a professional agrologist.

AGRI 410 is part of the professional agrology specialization and is obligatory for students wanting to become professional agrologists (*agronomes*) in Quebec as part of the 6 credits of practical training required by the *Ordre des agronomes du Quebec*.

Most undergraduate programs offered in the Faculty include the opportunity for a co-op work experience. Internships and co-op experience both involve a work placement of 12 to 16 weeks' duration 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 both your employer and your instructor.

When you register for an internship or co-op experience, you benefit from the practical learning that you undergo during your work term in a meaningful job situation. As well, you benefit from the non-tangible learning experience that comes from the increased responsibilities needed to acquire and successfully complete your work term.

You also have the opportunity to pursue a 6-credit internship within the Barbados and Panama Field Studies semesters. For details, see *Programs, Cour*

Specializations for Major Programs in the B.Sc.(Ag.Env.Sc.)
Environmental Economics
International Agriculture
Life Sciences (Multidisciplinary)
Microbiology and Molecular Biotechnology
Plant Biology
Plant Production
Professional Agrology
Soil and Water Resources
Wildlife Biology

** Consult the *2011–2012 Programs, Courses and University Regulations* publication at *www.mcgill.ca/study/2011-2012* or previous Calendars at *www.mcgill.ca/students/courses/calendars* for program requirements, or consult your academic adviser.

Revision, August 2013. End of revision.

6.4 Bachelor of Engineering in Bioresource Engineering – B.Eng.(Bioresource) (Overview)

See *section 7.3: Bachelor of Engineering (Bioresource) – B.Eng.(Bioresource)* for details.

The program leads to eligibility in any provincial professional engineering order. The Professional Agrology Option leads to eligibility in the *Ordre des agronomes du Québec*.

Bioresource Engineering:
Agricultural Engineering Stream
Bio-Environmental Engineering Stream
Ecological Engineering Stream
Food and Bioprocess Engineering Stream
Soil and Water Engineering Stream
Professional Agrology Option

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

See *section 7.4: Bachelor of Science (Food Science) - B.Sc.(F.Sc.)* for details.

Food Science:
Food Chemistry Option
Food Science Option

6.6 Bachelor of Science in Nutritional Sciences – B.Sc.(Nutr.Sc.) (Overview)

Two majors are offered by the School of Dietetics and Human Nutrition. See *section 7.5: Bachelor of Science (Nutritional Sciences) – B.Sc.(Nutr.Sc.)* for details.

Nutritional Sciences:
Dietetics (professional program leading to professional licensing as Dietitian/Nutritionist)
Nutrition:
Food Function and Safety
Global Nutrition

Nutritional Sciences:

Nutritional Biochemistry
Sports Nutrition

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

See *section 7.4.4: 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)* for details.

Food Science and Nutritional Sciences:

Food Science / Nutritional Science

6.8 Honours Programs (Overview)

Revision, August 2013. Start of revision.

Honours Programs

section 7.2.2.2: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Agricultural Economics (42 credits) – ***new***

section 7.2.3.2: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Agro-Environmental Sciences (42 credits) – ***new***

Minor Programs

International Agriculture – *section 7.6.10: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Minor International Agriculture (24 credits)*

Minor in Environment – see *Programs, Courses and University Regulations* > *Faculties & Schools* > *McGill School of Environment*

6.10 Post-Baccalaureate Certificate Programs (Overview)

The Faculty offers the following post-baccalaureate certificate programs.

Post-Baccalaureate Certificate Programs

Bioinformatics

Ecological Agriculture

Food Science

6.11 Diploma Program (Undergraduate) (Overview)

Diploma Program (Undergraduate)

Diploma in Environment, under *Programs, Courses and University Regulations* > *Faculties & Schools* > *McGill School of Environment*

6.12 Diploma in Collegial Studies (Overview)

Diploma in Collegial Studies

section 9: Farm Management and Technology Program

6.13 Environmental Sciences Programs (Overview)

6.13.1 McGill School of Environment (MSE)

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

A list of the B.Sc.(Ag.Env.Sc.) domains is given under *section 7.2: Bachelor of Science (Agricultural and Environmental Sciences) – B.Sc.(Ag.Env.Sc.)*. Further information on all programs is given under *Programs, Courses and University Regulations* > *Faculties & Schools* > *McGill School of Environment* and on the MSE website: *www.mcgill.ca/mse*.

6.13.2 Environmental Programs on the Macdonald Campus

A number of integrated environmental science programs are also offered on the Macdonald campus, particularly within the B.Sc.(Ag.Env.Sc.) and B.Eng.(Bioresource) degrees. The objective of these interdepartmental programs is to provide you with a well-rounded training in a specific interdisciplinary subject as well as the basis for managing natural resources. For a complete list of the programs, see *section 6: Overview of Programs Offered by the Faculty of Agricultural and Environmental Sciences*.

7 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.), Food Science (F.Sc.), 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.

7.1 Freshman Major

Program Director

Dr. Marcia Knutt
Macdonald-Stewart Building, Room 1-022
Telephone: 514-398-7976

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.

7.1.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Freshman Program (30 credits)

(All majors except Agricultural Economics - see Advising Notes below*)

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.

Freshman Adviser: Dr. Alice Cherestes

Macdonald-Stewart Building, Room 1-023

Telephone: 514-398-7980

Required Courses - Fall (14.5 credits)

(3) General Biology

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 Cour

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.

Freshman Adviser: Dr. Marcia Knutt

Macdonald-Stewart Building, Room 1-022

Telephone: 514-398-7976

Required Courses - Fall (14.5 credits)

AEBI 120	(3)	General Biology
AECH 110	(4)	General Chemistry 1
AEMA 101	(3)	Calculus 1
AEPH 113	(4)	Physics 1
BREE 187	(.5)	Freshman Seminar 1

Required Courses - Winter (15.5 credits)

AECH 111	(4)	General Chemistry 2
AEMA 102	(4)	Calculus 2
AEPH 115	(4)	Physics 2
BREE 103	(3)	Linear Algebra
BREE 188	(.5)	Freshman Seminar 2

7.1.3 Bachelor of Science (Food Science) (B.Sc.(F.Sc.)) - Freshman Program (30 credits)

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

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

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 (14.5 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 (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)

7.1.4 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Freshman Program (30 credits)

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

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

Students require a minimum 2.50 CGPA in order to progress into Year 1 of the Dietetics program.

Note: If you are not certain that you have adequate math and/or physics skills to commence the Freshman year, you may wish to take preparatory courses prior to the normal Fall semester. You are encouraged to discuss your potential need with your academic adviser. Mathematical skill level will be determined during the first week of classes. Your freshman adviser may recommend that you register for an additional weekly Pre-calculus Lab, of 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 (14.5 credits)

AEBI 120	(3)	General Biology
AECH 110	(4)	General Chemistry 1
AEMA 101	(3)	Calculus 1
AEPH 112	(4)	Introductory Physics 1
A3 Tm((ses - F)Tj1 0 0 271E35s) of the de)Tj1 0 0 1 239.901 518.102 Tm(gree prog64 co0e1m 1-023)T CGP	(.5)	Freshman Seminar 1

Macdonald-Stewart Building, Room 1-023

Telephone: 514-398-7980

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

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

7.2.1 General rules for the following B.Sc.(Ag.Env.Sc.) programs

Students register in one ***major*** and at least one ***specialization*** . They may design their own program by choosing one of the four majors and at least one of the specializations. By choosing two different specializations, students have the option of developing their own interdisciplinary interests. The multidisciplinary specializations are designed for those interested in broad training.

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

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

Revision, August 2013. Start of revision.

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.

Majors and Honours:

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

Revision, August 2013. End of revision.

Specializations:

- Agribusiness, *section 7.2.7.2: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Agribusiness (24 credits)*
- Animal Biology, *section 7.2.7.3: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Animal Biology (24 credits)*
- Animal Health and Disease, *section 7.2.7.4: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Animal Health and Disease (24 credits)*
- Animal Production, *section 7.2.7.5: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Animal Production (24 credits)*

- Applied Ecology, *section 7.2.7.6: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Applied Ecology (24 credits)*
- Ecological Agriculture, *section 7.2.7.7: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Ecological Agriculture (24 credits)*
- Environmental Economics, *section 7.2.7.8: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Environmental Economics (24 credits)*
- International Agriculture, *section 7.2.7.9: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - International Agriculture (24 credits)*
- Life Sciences (Multidisciplinary), *section 7.2.7.10: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Life Sciences (Multidisciplinary) (24 credits)*
- Microbiology and Molecular Biotechnology, *section 7.2.7.11: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Microbiology and Molecular Biotechnology (24 credits)*
- Plant Biology, *section 7.2.7.12: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Plant Biology (24 credits)*
- Plant Production, *section 7.2.7.13: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Plant Production (24 credits)*
- Professional Agrology, *section 7.2.7.14: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Professional Agrology (21 credits)*
- Soil and Water Resources, *section 7.2.7.15: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Soil and Water Resources (24 credits)*
- Wildlife Biology, *section 7.2.7.16: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Wildlife Biology (24 credits)*

7.2.2 B.Sc.(Ag.Env.Sc.) – Agricultural Economics Major and Honours

Revision, August 2013. Start of revision.

Program Director: Professor John Henning

Revision, August 2013. End of revision.

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

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, one introductory course in each of the following areas:

Accounting

Statistics

Written/Oral Communication

Specialization (21 - 24 credits)

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.

Revision, July 2013. End of revision.

7.2.3 B.Sc.(Ag.Env.Sc.) – Agro-Environmental Sciences Major and Honours

Revision, August 2013. Start of revision.

Program Director: Professor Roger I. Cue

Revision, August 2013. End of revision.

7.2.3.1 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

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

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.

7.2.3.2 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Agro-Environmental Sciences (42 credits)

Revision, July 2013. Start of revision.

NEW PROGRAM

Program Director: Professor Roger Cue

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

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

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.

Revision, July 2013. End of revision.

7.2.4 B.Sc.(Ag.Env.Sc.) – Environmental Biology Major and Honours

Revision, August 2013. Start of revision.

Program Director: Professor Chris Buddle

Revision, August 2013. End of revision.

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

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

Program Director: Professor Christopher Buddle

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

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 (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 315	(3)	Science of Inland Waters
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
ENVB 506	(3)	Quantitative Methods: Ecology
ENVR 203	(3)	Knowledge, Ethics and Environment
LSCI 230	(3)	Introductory Microbiology
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
SOIL 326	(3)	Soils in a Changing Environment
WILD 302	(3)	Fish Ecology
WILD 307	(3)	Natural History of Vertebrates

Specialization

At least one specialization of 18-24 credits.

Specializations designed to be taken with the Environmental Biology Major:

- Applied Ecology
- Plant Biology
- Wildlife Biology

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

Electives

To meet the minimum credit requirement for the degree.

7.2.4.2 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Environmental Biology (42 credits)

Revision, July 2013. Start of revision.

NEW PROGRAM

Program Director: Professor Christopher Buddle

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.

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

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 (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 315	(3)	Science of Inland Waters
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
ENVB 506	(3)	Quantitative Methods: Ecology
ENVR 203	(3)	Knowledge, Ethics and Environment
LSCI 230	(3)	Introductory Microbiology
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
SOIL 326	(3)	Soils in a Changing Environment
WILD 302	(3)	Fish Ecology
WILD 307	(3)	Natural History of Vertebrates

Specialization

At least one specialization of 18-24 credits.

Specializations designed to be taken with the Environmental Biology Major:

- Applied Ecology

- Plant Biology

- Wildlife Biology

Note: For a complete list of specializations offered for 0 0 10 1 215.006 12l7.52 1 0 1 67.52 139O.1iachelnd the 1 280.4 13 Tm(vironmen69.10110 1 215.006 0 1 470.84

Revision, July 2013. End of revision.

7.2.5 B.Sc.(Ag.Env.Sc.) – Global Food Security Major and Honours

Revision, August 2013. Start of revision.

Program Director: Professor Humberto Monardes

Revision, August 2013. End of revision.

7.2.5.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Major Global Food Security (42 credits)

Revision, June 2013. Start of revision.

NEW PROGRAM

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

Program Director: Professor Humberto Monardes

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Program Prerequisites

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

Required Courses (33 credits)

AEBI 210	(3)	Organisms 1
AEMA 310	(3)	Statistical Methods 1
AGEC 200	(3)	Principles of Microeconomics
AGEC 442	(3)	Economics of International Agricultural Development
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
AGRI 499	(3)	Agricultural Development Internship
ANSC 250	(3)	Principles of Animal Science
ENVB 210	(3)	The Biophysical Environment
INTD 200	(3)	Introduction to International Development
NUTR 207	(3)	Nutrition and Health
NUTR 341	(3)	Global Food Security

Complementary Courses (9 credits)

AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 493	(3)	International Project Management
ANSC 420	(3)	Animal Biotechnology
BREE 217	(3)	Hydrology and Water Resources
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
NRSC 221	(3)	Environment and Health
NUTR 501	(3)	Nutrition in Developing Countries

PLNT 300	(3)	Cropping Systems
PLNT 435	(3)	Plant Breeding
SOIL 315	(3)	Soil Nutrient Management

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.

(6)	Honours Research Project 1

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Program Prerequisites

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

Required Courses (27 credits)

* Other appropriate Statistics courses may be approv

PLNT 304	(3)	Biology of Fungi
PLNT 353	(3)	Plant Structure and Function
PLNT 426	(3)	Plant Ecophysiology
PLNT 435	(3)	Plant Breeding
	(3)	Issues: Environmental Sciences

AEMA 310*	(3)	Statistical Methods 1
LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology

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 (15 credits)

15 credits of the complementary courses selected from:

AEHM 330	(3)	Academic and Scientific Writing
ANSC 234	(3)	Biochemistry 2
ANSC 250	(3)	Principles of Animal Science
ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 330	(3)	Fundamentals of Nutrition
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 420	(3)	Animal Biotechnology
BINF 301	(3)	Introduction to Bioinformatics
BINF 511	(3)	Bioinformatics for Genomics
BTEC 306	(3)	Experiments in Biotechnology
ENVB 210	(3)	The Biophysical Environment
ENVB 222	(3)	St. Lawrence Ecosystems
LSCI 451	(3)	Research Project 1
LSCI 452	(3)	Research Project 2
MICR 331	(3)	Microbial Ecology
MICR 338	(3)	Bacterial Molecular Genetics
MICR 341	(3)	Mechanisms of Pathogenicity

MICR 450	(3)	Environmental Microbiology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
PLNT 304	(3)	Biology of Fungi
PLNT 353	(3)	Plant Structure and Function
PLNT 426	(3)	Plant Ecophysiology
PLNT 435	(3)	Plant Breeding
WILD 375	(3)	Issues: Environmental Sciences
WILD 424	(3)	Parasitology

Specialization

At least one specialization of 18-24 credits from:

Specializations offered in 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 En

Complementary Courses (9 credits)

9 credits chosen from the following list:

ACCT 361	(3)	Management Accounting
AGRI 310	(3)	Internship in Agriculture/Environment
BUSA 364	(3)	Business Law 1
MGCR 341	(3)	Finance 1
MGCR 352	(3)	Marketing Management 1
MGCR 382	(3)	International Business
MGSC 373	(3)	Operations Research 1
ORGB 321	(3)	Leadership

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

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

Specialization Coordinator: Professor Roger Cue

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Required Courses (15 credits)

Animal Health and Disease

Specialization Coordinator: Professor Sarah Kimmins

Academic Adviser: Dr. Julie Major

7.2.7.6 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 sytems. We manage ecosystems to provice these services and our use and misuse often degrades the ability ecosystems to provice 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. Concetps and tools will be presented that help you to deal with the comlexity that an ecosystem perspective brings. The goeal of this minor is to provide students with an opprotunity to further develop their understanding of the ecosystem processes, ecology, and systems thinking necessary to understand, design and manage our interaction with the environment.

Specialization Coordinator: Professor Elena Bennett

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Required Courses (9 credits)

ENVB 305	(3)	Population & Community Ecology
ENVB 415	(3)	Ecosystem Management
ENVB 437	(3)	Assessing Environmental Impact

Complementary Courses (15 credits)

15 credits of complementary courses selected as follows:

A minimum of 6 credits are selected from the Abiotic list below:

AGRI 435	(3)	Soil and Water Quality Management
BREE 217	(3)	Hydrology and Water Resources
BREE 322	(3)	Organic Waste Management
BREE 327	(3)	Bio-Environmental Engineering
BREE 510	(3)	Watershed Systems Management
ENVB 301	(3)	Meteorology
ENVB 430	(3)	GIS for Natural Resource Management
ENVB 506	(3)	Quantitative Methods: Ecology
NRSC 333	(3)	Pollution and Bioremediation
SOIL 300	(3)	Geosystems
SOIL 326	(3)	Soils in a Changing Environment
SOIL 510	(3)	Environmental Soil Chemistry

A minimum of 6 credits are selected from the Biotic list below:

AGRI 340	(3)	Principles of Ecological Agriculture
ENTO 440	(3)	Insect Diversity
ENVB 315	(3)	Science of Inland Waters
MICR 331	(3)	Microbial Ecology
MICR 450	(3)	Environmental Microbiology
PLNT 304	(3)	Biology of Fungi
PLNT 358	(3)	Flowering Plant Diversity
PLNT 426	(3)	Plant Ecophysiology
PLNT 460	(3)	Plant Ecology

WILD 302	(3)	Fish Ecology
WILD 307	(3)	Natural History of Vertebrates
WILD 350	(3)	Mammalogy
WILD 420	(3)	Ornithology

7.2.7.7 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.

Specialization Coordinator: Dr. Caroline Begg

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Required Courses (6 credits)

AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture

Complementary Courses (18 credits)

3 credits from/ c/83 Tm(vir)9l.0.0.0.0.0.0.0Nd go

PLNT 426	(3)	Plant Ecophysiology
PLNT 460	(3)	Plant Ecology

7.2.7.8 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 to prepare students for careers in natural resource management and the analysis of environmental problems and policies.

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

Specialization Adviser: Professor John Henning

Macdonald-Stewart Building, Room 3-038

Telephone: 514-398-7826

Required Courses (9 credits)

ENVB 305	(3)	Population & Community Ecology
ENVB 437	(3)	Assessing Environmental Impact
ENVB 506	(3)	Quantitative Methods: Ecology

Complementary Courses (15 credits)

At least 15 credits chosen from the following list:

AGRI 310	(3)	Internship in Agriculture/Environment
BREE 217	(3)	Hydrology and Water Resources
ECON 225	(3)	Economics of the Environment
ECON 326	(3)	Ecological Economics
ECON 405	(3)	Natural Resource Economics
ENVB 301	(3)	Meteorology
ENVR 203	(3)	Knowledge, Ethics and Environment
MICR 331	(3)	Microbial Ecology
NRSC 333	(3)	Pollution and Bioremediation
WILD 415	(2)	Conservation Law
WILD 421	(3)	Wildlife Conservation

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

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

Specialization Adviser: Professor Humberto Monardes

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Required Courses (9 credits)

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

NUTR 501	(3)	Nutrition in Developing Countries

Complementary Courses (15 credits)

15 credits of complementary courses selected from either Option A or Option B.

Option A

3 credits from husbandry/cropping/farming:

AGRI 215	(3)	Agro-Ecosystems Field Course
PLNT 203	(3)	Economic Botany
PLNT 300	(3)	Cropping Systems

Plus 3 credits from field experience:

AGRI 325	(3)	Sustainable Agriculture and Food Security
AGRI 499	(3)	Agricultural Development Internship

Plus 3 credits from policy and economics:

AGEC 333	(3)	Resource Economics
AGEC 430	(3)	Agriculture, Food and Resource Policy

Plus 6 credits from resource/environment:

BREE 510	(3)	Watershed Systems Management
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation

Option B

15 credits from any of the McGill Field Study Semesters listed below:

Africa Field Study Semester (Winter)

15 credits selected as follows:

9 credits of courses chosen from the complementary course set offered in the year of participation in the Field Study Semester.

6 credits of required courses as listed below:

GEOG 416	(3)	Africa South of the Sahara
NRSC 405	(3)	Natural History of East Africa

Barbados Field Study Semester (Fall)

15 credits selected as follows:

A	(3)	Water Resources in Barbados

15 credits selected as follows:

AEBI 421	(3)	Tropical Horticultural Ecology
AEBI 423	(3)	Sustainable Land Use
AEBI 425	(3)	Tropical Energy and Food
AEBI 427	(6)	Barbados Interdisciplinary Project

Panama Field Study Semester (Winter)

15 credits selected as follows:

9 credits of required courses

BIOL 553	(3)	Neotropical Environments
ENVR 451	(6)	Research in Panama

6 credits of complementary courses

Choose one of the following sets:

AGRI 550	(3)	Sustained Tropical Agriculture
HIST 510	(3)	Environmental History of Latin America (Field)

OR

GEOG 404	(3)	Environmental Management 2
GEOG 498	(3)	Humans in Tropical Environments

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

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

Academic Adviser: Professor Brian Driscoll

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Complementary Courses (24 credits)

24 credits selected from the following list:

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 330	(3)	Fundamentals of Nutrition
ANSC 350	(3)	Food-Borne Pathogens
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 420	(3)	Animal Biotechnology
ANSC 424	(3)	Metabolic Endocrinology

industrial research laboratories, in the pharmaceutical, fermentation and food industries, and with an appropriate CGPA proceed to post-graduate studies or professional biomedical schools.

Specialization Coordinator: Professor Brian Driscoll

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Required Courses (18 credits)

BTEC 306	(3)	Experiments in Biotechnology
MICR 331	(3)	Microbial Ecology
MICR 338	(3)	Bacterial Molecular Genetics
MICR 341	(3)	Mechanisms of Pathogenicity
MICR 450	(3)	Environmental Microbiology
PARA 438	(3)	Immunology

Complementary Courses and Suggested Electives (6 credits)

ANSC 350	(3)	Food-Borne Pathogens
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 420	(3)	Animal Biotechnology
BINF 301	(3)	Introduction to Bioinformatics
BTEC 501	(3)	Bioinformatics
BTEC 535	(3)	Functional Genomics in Model Organisms
BTEC 555	(3)	Structural Bioinformatics
FDSC 442	(3)	Food Microbiology
MIMM 324	(3)	Fundamental Virology
NRSC 333	(3)	Pollution and Bioremediation
PLNT 304	(3)	Biology of Fungi
WILD 424	(3)	Parasitology

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

This specialization emphasizes the study of plants from the cellular to the organismal level. The structure, physiology, development, evolution, and ecology of plants will be studied. Most courses offer laboratory classes that expand on the lecture material and introduce students to the latest techniques in plant biology. Many laboratory exercises use the excellent research and field facilities at the Morgan Arboretum, McGill Herbarium, Emile A. Lods Agronomy Research Centre, the Horticultural Centre and the Plant Science greenhouses as well as McGill field stations. Students may undertake a research project under the guidance of a member of the Plant Science Department as part of their studies. Graduates with the specialization may continue in post-graduate study or work in the fields of botany, mycology, molecular biology, ecology, conservation, or environmental science.

Specialization Coordinator: Professor Marcia Waterway

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Required Courses (9 credits)

PLNT 353	(3)	Plant Structure and Function
PLNT 358	(3)	Flowering Plant Diversity
PLNT 426	(3)	Plant Ecophysiology

Complementary Courses (15 credits)

15 credits of complementary courses selected from:

ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 400	(3)	Eukaryotic Cells and Viruses
BINF 511	(3)	Bioinformatics for Genomics
BTEC 306	(3)	Experiments in Biotechnology
ENVB 313	(3)	Phylogeny and Biogeography
PLNT 203	(3)	Economic Botany
PLNT 304	(3)	Biology of Fungi
PLNT 305	(3)	Plant Pathology
PLNT 310	(3)	Plant Propagation
PLNT 435	(3)	Plant Breeding
PLNT 460	(3)	Plant Ecology

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

The goal of this specialization is to give students an excellent background in the knowledge and skills relating to the biology and physiology, breeding, propagation, and management of domesticated plants. The plant industry, in both rural and urban settings, is a sector of growing importance to Canadian and global economies. Graduates may find employment directly with plants in horticulture or in field crop development, production, and management; or in government services, extension, teaching, consulting, or postgraduate studies. When taken in conjunction with the Major Agro-Environmental Sciences and the specialization in Professional Agrology, this specialization conforms with the eligibility requirements for the Ordre des agronomes du Québec.

Specialization Coordinator: Professor Jaswinder Singh

Academic Adviser: Dr. Julie Major

Macdonald-Stewart Building, Room 2-082

Telephone: 514-398-8380

Required Courses (18 credits)

PLNT 300	(3)	Cropping Systems
PLNT 305	(3)	Plant Pathology
PLNT 310	(3)	Plant Propagation
PLNT 353	(3)	Plant Structure and Function
PLNT 434	(3)	Weed Biology and Control
PLNT 435	(3)	Plant Breeding

Complementary Courses (6 credits)

6 credits of complementary courses selected from:

AGRI 340	(3)	Principles of Ecological Agriculture
PLNT 203	(3)	Economic Botany
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
PLNT 331	(3)	Grains and Biofuel Crops
PLNT 489	(1)	Project Planning and Proposal
PLNT 490	(2)	Research Project

SOIL 445	(3)	Agroenvironmental Fertilizer Use

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

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

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

3 credits from:

	(3)	Cropping Systems

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

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

Specialization Coordinator: Professor Murray Humphries

Academic Adviser: Dr. Julie Major

Macdonald-Stew

In the **Food and Bioprocessing** stream, students are taught about the engineering of foods and food processes, physical properties of biological materials, post-harvest technology, fermentation and bio-processing, the management of organic wastes, biotechnology, the design of machinery for bioprocessing, etc.

Students who specialize in the **Agricultural Engineering** stream will learn about machine design, machinery, robotics, structural design, environmental quality control, waste management, artificial intelligence, GIS, remote sensing, complex system simulation, and much more.

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Complementary Courses

60 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)

36 credits - Set D (Engineering)

Set A

One of the following:

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

One of the following:

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

Set B - Natural Sciences and Mathematics

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

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

Plus 6 credits chosen in consultation with the Academic Adviser.

Set C - Social Sciences

Minimum of 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
SOCI 235	(3)	Technology and Society

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

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

Set D - Engineering

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
BREE 412	(3)	Machinery Systems Engineering
BREE 416	(3)	Engineering for Land Development
BREE 418	(3)	Soil Mechanics and Foundations
BREE 419	(3)	Structural Design
BREE 420	(3)	Engineering for Sustainability
BREE 423	(3)	Biological Material Properties
BREE 430	(3)	GIS for Natural Resource Management
BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 502	(3)	Drainage/Irrigation Engineering
BREE 504	(3)	Instrumentation and Control
BREE 506	(3)	Advances in Drainage Management
BREE 509	(3)	Hydrologic Systems and Modelling
BREE 510	(3)	Watershed Systems Management
BREE 512	(3)	Soil Cutting and Tillage
BREE 515	(3)	Soil Hydrologic Modelling
BREE 518	(3)	Bio-Treatment of Wastes
BREE 519	(3)	Advanced Food Engineering
BREE 520	(3)	Food, Fibre and Fuel Elements
BREE 525	(3)	Climate Control for Buildings
BREE 530	(3)	Fermentation Engineering
BREE 531	(3)	Post-Harvest Drying
BREE 532	(3)	Post-Harvest Storage
BREE 533	(3)	Water Quality Management
CHEE 474	(3)	Biochemical Engineering
CIVE 317	(3)	Structural Engineering 1
CIVE 318	(3)	Structural Engineering 2

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

Revision, July 2013. Start of revision.

NEW PROGRAM

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.

Required Courses (53 credits)

AEMA 202	(3)	Intermediate Calculus
AEMA 305	(3)	Differential Equations
BREE 205	(3)	Engineering Design 1
BREE 210	(3)	Mechanical Analysis & Design
BREE 216	(3)	Bioresource Engineering Materials
BREE 252	(3)	Computing for Engineers
BREE 301	(3)	Biothermodynamics
BREE 305	(3)	Fluid Mechanics
BREE 312	(3)	Electric Circuits and Machines
BREE 319	(3)	Engineering Mathematics
BREE 327	(3)	Bio-Environmental Engineering
BREE 341	(3)	Mechanics of Materials
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
	(3)	Engineering Design 2

60 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)

36 credits - Set D (Engineering)

Set A

One of the following:

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

One of the following:

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

Set B - Natural Sciences and Mathematics

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

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

Plus 6 credits chosen in consultation with the Academic Adviser.

Set C - Social Sciences

Minimum of 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
SOCI 235	(3)	Technology and Society

Plus 6 credits of Social Sciences, Management Studies, Humanities, or Law courses at the U1 undergraduate lev

BREE 314	(3)	Agri-Food Buildings
BREE 315	(3)	Design of Machines
BREE 322	(3)	Organic Waste Management
BREE 325	(3)	Food Process Engineering
BREE 412	(3)	Machinery Systems Engineering
BREE 416	(3)	Engineering for Land Development
BREE 418	(3)	Soil Mechanics and Foundations
BREE 419	(3)	Structural Design
BREE 420	(3)	Engineering for Sustainability
BREE 423	(3)	Biological Material Properties
BREE 430	(3)	GIS for Natural Resource Management
BREE 497	(3)	Bioresource Engineering Project
BREE 501	(3)	Simulation and Modelling
BREE 502	(3)	Drainage/Irrigation Engineering
BREE 504	(3)	Instrumentation and Control
BREE 506	(3)	Advances in Drainage Management
BREE 509	(3)	Hydrologic Systems and Modelling
BREE 510	(3)	Watershed Systems Management
BREE 512	(3)	Soil Cutting and Tillage
BREE 515	(3)	Soil Hydrologic Modelling
BREE 518	(3)	Bio-Treatment of Wastes
BREE 519	(3)	Advanced Food Engineering
BREE 520	(3)	Food, Fibre and Fuel Elements
BREE 525	(3)	Climate Control for Buildings
BREE 530	(3)	Fermentation Engineering
BREE 531	(3)	Post-Harvest Drying
BREE 532	(3)	Post-Harvest Storage
BREE 533	(3)	Water Quality Management
CHEE 474	(3)	Biochemical Engineering
CIVE 317	(3)	Structural Engineering 1
CIVE 318	(3)	Structural Engineering 2

Revision, July 2013. End of revision.

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

Academic Adviser-U1: Professor Grant Clark

Macdonald-Stewart Building, Room 1-099

Telephone: 514-398-7784

Required Courses (56 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
BREE 252	(3)	Computing for Engineers
BREE 301	(3)	Biothermodynamics
BREE 305	(3)	Fluid Mechanics
BREE 312	(3)	Electric Circuits and Machines
BREE 319	(3)	Engineering Mathematics
BREE 327	(3)	Bio-Environmental Engineering
BREE 341	(3)	Mechanics of Materials
BREE 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
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 follows:

6 credits - Set A

12 credits - Set B (Natural Sciences)

6 credits - Set C (Social Sciences)

33 credits - Set D (Engineering)

Set A

6 credits

One course from the following:

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

One course selected from:

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

Set B - Natural Sciences

6 credits from e41 Tm(57 cred Tm((3))Tj1 0 0 1 741 0 0 1 1 45redits from e 221 tw0 1 741 0 0 j/F89redits from eo group.52 36 1 67.52 115.649 Tm(Set 77.5 - SetG.86

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
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
PLNT 331	(3)	Grains and Biofuel Crops

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
SOCI 235	(3)	Technology and Society

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

Set D - Engineering

33 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
BREE 322	(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 502	(3)	Drainage/Irrigation Engineering
BREE 506	(3)	Advances in Drainage Management
BREE 509	(3)	Hydrologic Systems and Modelling

BREE 510	(3)	Watershed Systems Management
BREE 512	(3)	Soil Cutting and Tillage
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
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 419	(3)	Structural Design
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 525	(3)	Climate Control for Buildings
CIVE 317	(3)	Structural Engineering 1
CIVE 318	(3)	Structural Engineering 2

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

7.3.6.1 Minor in Environmental Engineering

For more information, see *section 7.6.8: Minor in Environmental Engineering*.

7.3.6.2 Barbados Field Study Semester

For more information, see *Programs, Courses and University Regulations > Faculties & Schools > Field Studies > Undergraduate > : Barbados Field Study Semester*.

7.3.6.3 Internship Opportunities and Co-op Experiences

For more information, see *section 6.1: Internship Opportunities and Co-op Experience*.

7.4 Bachelor of Science (Food Science) - B.Sc.(F.Sc.)

The Food Science program has been designed to combine the basic sciences, particularly chemistry, with specialty courses that are directly related to the discipline.

Freshman Adviser

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

7.4.1 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.

Academic Adviser-U1: Professor Salwa Karboune

Macdonald-Stewart Building, Room 1-040

Telephone: 514-398-8666

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

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

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

Academic Adviser-U1: Professor Selim Kermasha

Macdonald-Stewart Building, Room 1-041

Telephone: 514-398-7922

Required Courses (80 credits)

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

Complementary Courses (30 credits)

Complementary courses are selected as follows:

At least 9 credits from the following:

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

Psychology 165.864 664.54 Tm(c3.82 Tm((3))Tj1 0 0 1 70Tm(c3.82NUTR0 01C 340)Tj1 0 0 1 221.33/F1 .98 pplied Sc

(3)3)

FDSC 305	(3)	Food Chemistry 2
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
FDSC 315	(3)	Separation Techniques in Food Analysis 1
FDSC 319	(3)	Food Commodities
FDSC 330	(3)	Food Processing
FDSC 334	(3)	Analysis of Food Toxins and Toxicants
FDSC 400	(3)	Food Packaging
FDSC 442	(3)	Food Microbiology
FDSC 497	(1.5)	Professional Seminar: Food
FDSC 525	(3)	Food Quality Assurance
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 307	(3)	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.

Revision, July 2013. End of revision.

7.4.5.1 About the Concurrent Bachelor of Science in Food Science (B.Sc.(F.Sc.)) and Bachelor of Science in Nutritional Sciences (B.Sc.(Nutr.Sc.)) Program

Unique in North America, the new concurrent degree program in Food Science and Nutritional Science offers the best education in these complementary fields and opens the door to a multitude of career paths.

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

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

Certificate in Food Science

Academic Advising Coordinator

School of Dietetics and Human Nutrition

7.5.3 About the B.Sc. (Nutritional Sciences) Program

Freshman Adviser

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

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

The Dietetics Major, which includes a 40-week internship (Stage) as part of its degree requirements, is a professional program that leads to membership in a provincial regulatory body and professional licensure as a dietitian/nutritionist.

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 nutritionists, dietitians may work in health-care settings, nutrition counselling centres, clinics, and private practice. As community nutritionists, dietitians are involved in nutrition education programs through school boards, sports centres, 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.

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. Forty weeks of supervised professional experience, "Stage", in clinical and community nutrition and food service systems management are included in the undergraduate program.

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

Academic Advising Coordinator: Sandy ca4eiingp6.5prnatud equg Coordinator: Sandy p Postgraduate oordii5et9R 1 11(O.P

AGEC 343	(3)	Accounting and Cost Control
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*	(1)	Professional Practice Stage 1A
NUTR 209*	(2)	Professional Practice Stage 1B
NUTR 214	(4)	Food Fundamentals
NUTR 217	(4)	Application: Food Fundamentals
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 344	(4)	Clinical Nutrition 1
NUTR 345	(3)	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 436	(2)	Nutritional Assessment
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

Complementary Courses (9 credits)

3 credits from either:

ANSC 330	(3)	Fundamentals of Nutrition
NUTR 307	(3)	Human Nutrition

Note: ANSC 330 or NUTR 307 must be takANSC 330 or 0 1 21Tj1 0 0 1(A2cI.864 442.(ood Productio21.Tj0 1(A2cI.86all4 25U2.ote:)Tj1 0 0 1 818.9491 0 0 1 221.94

RELG 270	(3)	Religious Ethics and the Environment

Or social science course 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.

Alternate elective choices may include, but are not limited to:

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

A Compulsory Immunization

A compulsory immunization program exists at McGill which is required for Dietetics students to practice. Students should complete their immunization before or soon after arriving at Macdonald campus; confirmation of medical/health documentation will be sent by the health nurse to the University Coordinator (Stage) and must be complete prior to commencement of Stage. Certain deadlines may apply.

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

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

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

Academic Advising Coordinator: Professor Kristine Koski

School of Dietetics and Human Nutrition

Macdonald-Stewart Building, Room 2-039

Telephone: 514-398-7840

Required Courses (60 credits)

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

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1
FDSC 300	(3)	Principles of Food Analysis 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals

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

Complementary Courses (15 credits)

15 credits of complementary courses are selected as follows:

3 credits, one of the following courses:

	(3)	Fundamentals of Nutrition

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

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

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

Academic Advising Coordinator: Professor Kristine Koski

School of Dietetics and Human Nutrition

Macdonald-Stewart Building, Room 2-039

Telephone: 514-398-7840

Required Courses (60 credits)

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

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 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 501	(3)	Nutrition in Developing Countries
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data

Complementary Courses (15 credits)

15 credits of complementary courses are selected as follows:

3 credits, one of the following courses:

ANSC 330	(3)	Fundamentals of Nutrition
NUTR 307	(3)	Human Nutrition

At least 3 credits selected from:

ANSC 560	(3)	Biology of Lactation

NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 511	(3)	Nutrition and Behaviour
NUTR 545	(5)	Clinical Nutrition 2

At least 9 credits selected from:

AGEC 330	(3)	Agriculture and Food Markets
AGEC 442	(3)	Economics of International Agricultural Development
AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
ANSC 560	(3)	Biology of Lactation
ANTH 227	(3)	Medical Anthropology

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 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 (15 credits)

15 credits of complementary courses are selected as follows:

3 credits, one of the following courses:

ANSC 330	(3)	Fundamentals of Nutrition
NUTR 307	(3)	Human Nutrition

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 314	(3)	Intermediate Immunology
MIMM 414	(3)	Advanced Immunology
NUTR 430	(3)	Directed Studies: Dietetics and Nutrition 1
NUTR 436	(2)	Nutritional Assessment
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 (15 credits)

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

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7.5.8 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 publication for prerequisites and minimum credit requirements.

Academic Advising Coordinator: Professor Kristine Koski

School of Dietetics and Human Nutrition

Macdonald-Stewart Building, Room 2-039

Telephone: 514-398-7840

Required Courses (60 credits)

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

AEMA 310	(3)	Statistical Methods 1
ANSC 234	(3)	Biochemistry 2
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
BTEC 306	(3)	Experiments in Biotechnology
FDSC 200	(3)	Introduction to Food Science
FDSC 251	(3)	Food Chemistry 1
FDSC 305	(3)	Food Chemistry 2
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals
NUTR 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

Complementary Courses (15 credits)

15 credits of complementary courses are selected as follows:

3 credits, one of the following courses:

ANSC 330	(3)	Fundamentals of Nutrition
NUTR 307	(3)	Human Nutrition

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

Refer to "Faculty Information and Re

EDKP 330	(3)	Physical Activity and Health Exercise Ph

AGEC 330	(3)	Agriculture and Food Markets
AGEC 333	(3)	Resource Economics

Complementary Courses (12 credits)

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

AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture
ANSC 451	(3)	Dairy and Beef Production Management
ANSC 458	(3)	Swine and Poultry Production
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits
PLNT 331	(3)	Grains and Biofuel Crops

7.6.4 Minor Animal Biology (24 credits)

The Minor

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

Academic Adviser: Professor Sarah Kimmins

Macdonald-Stewart Building, Room 1-091

Telephone: 514-398-7658

Required Courses (15 credits)

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

Complementary Courses (9 credits)

9 credits selected from the following list:

ANSC 251	(3)	Comparative Anatomy
ANSC 330	(3)	Fundamentals of Nutrition
ANSC 350	(3)	Food-Borne Pathogens
LSCI 451	(3)	Research Project 1
PARA 410	(3)	Environment and Infection
WILD 311	(3)	Ethology
WILD 424	(3)	Parasitology

7.6.6 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 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

AGRI 435	(3)	Soil and Water Quality Management
BREE 217	(3)	Hydrology and Water Resources
BREE 322	(3)	Organic Waste Management
BREE 327	(3)	Bio-Environmental Engineering
BREE 510	(3)	Watershed Systems Management
ENVB 301	(3)	Meteorology
ENVB 430	(3)	GIS for Natural Resource Management
ENVB 506	(3)	Quantitative Methods: Ecology
NRSC 333	(3)	Pollution and Bioremediation
SOIL 300	(3)	Geosystems
SOIL 326	(3)	Soils in a Changing Environment
SOIL 510	(3)	Environmental Soil Chemistry

A minimum of 6 credits are selected from the Biotic list below:

AGRI 340	(3)	Principles of Ecological Agriculture
ENTO 440	(3)	Insect Diversity
		Science of Inland Waters

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 (9 credits)

A	(3)	Agro-Ecosystems Field Course

One of:

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

One of:

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

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

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

Minor Adviser: Professor Humberto Monardes

Macdonald-Stewart Building, Room 1-093

Telephone: 514-398-7809

Required Courses (9 credits)

AGEC 442	(3)	Economics of International Agricultural Development
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
NUTR 501	(3)	Nutrition in Developing Countries

Complementary Courses (15 credits)

15 credits of complementary courses selected from either Option A or Option B.

Option A

3 credits from husbandry/cropping/farming:

AGRI 215	(3)	Agro-Ecosystems Field Course
PLNT 203	(3)	Economic Botany
PLNT 300	(3)	Cropping Systems

Plus 3 credits from field experience:

AGRI 325	(3)	Sustainable Agriculture and Food Security
AGRI 499	(3)	Agricultural Development Internship

Plus 3 credits from policy and economics:

AGEC 333	(3)	Resource Economics
AGEC 430	(3)	Agriculture, Food and Resource Policy

Plus 6 credits from resource/environment:

BREE 510	(3)	Watershed Systems Management
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation

Option B

15 credits from any of the McGill Field Study Semesters listed below:

Africa Field Study Semester (Winter)

15 credits in African Field Study Semester are selected as follows:

9 credits of courses chosen from the complementary course set offered in the year of participation in the Field Study Semester.

6 credits of required courses as listed below:

GEOG 416	(3)	Africa South of the Sahara
NRSC 405	(3)	Natural History of East Africa

Barbados Field Study Semester (Fall)

15 credits selected as follows:

AGRI 452	(3)	Water Resources in Barbados
AGRI 519	(6)	Sustainable Development Plans
URBP 507	(3)	Planning and Infrastructure
URBP 520	(3)	Globalization: Planning and Change

Barbados Interdisciplinary Tropical Studies Field Semester (Summer)

15 credits selected as follows:

AEBI 421	(3)	Tropical Horticultural Ecology
AEBI 423	(3)	Sustainable Land Use
AEBI 425	(3)	Tropical Energy and Food
AEBI 427	(6)	Barbados Interdisciplinary Project

GEOG 404	(3)	Environmental Management 2
GEOG 498	(3)	Humans in Tropical Environments

7.7 Post-Baccalaureate Certificate Programs

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

7.7.1 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. The certificate may be of special interest to professional agrologists who want further training, as well as formal recognition that they have completed a coherent program of courses beyond their B.Sc. studies.

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

Academic Adviser: Dr. Caroline Begg

Raymond Building, Room 2-028a

Telephone: 514-398-8749

General Regulations

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

Notes:

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

2. Students using AGRI 310 toward the requirements of the Specialization/Minor/Certificate are limited to an experience on farms or other enterprises that are organic, biodynamic, or practising permaculture. The placement must be approved by the academic adviser for the specialization/Minor/certificate.

Required Courses (9 credits)

AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture
RELG 270	(3)	Religious Ethics and the Environment

Complementary Courses (21 credits)

Revision, July 2013. Start of revision.

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

AGEC 430	(3)	Agriculture, Food and Resource Policy
AGRI 310	(3)	Internship in Agriculture/Environment
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
AGRI 435	(3)	Soil and Water Quality Management
ENTO 352	(3)	Biocontrol of Pest Insects
ENVB 305	(3)	Population & Community Ecology
ENVB 410	(3)	Ecosystem Ecology
MICR 331	(3)	Microbial Ecology
NUTR 512	(3)	Herbs, Foods and Phytochemicals
PLNT 302	(3)	Forage Crops and Pastures
PLNT 426*	(3)	Plant Ecophysiology
PLNT 434	(3)	Weed Biology and Control
PLNT 460	(3)	Plant Ecology

SOIL 326	(3)	Soils in a Changing Environment
SOIL 335*	(3)	Soil Ecology and Management
SOIL 445*	(3)	Agroenvironmental Fertilizer Use
WILD 311	(3)	Ethology

Revision, July 2013. End of revision.

7.7.2 Certificate in Food Science (30 credits)

This 30-credit program will appeal to mature students who have a first degree in a science-related discipline. Students must complete the Introduction to Food Science, Food Microbiology, and Quality Assurance courses, at least three Food Chemistry/Analysis courses, two Processing/Engineering courses, and at least one course in communication skills, ethics, or business skills. Entry to this program is permitted only in September.

Academic Adviser: Professor Hosahalli S. Ramaswamy

Macdonald-Stew

9 credits from the following:

AGRI 510	(3)	Professional Practice

9 Farm Management and Technology Program

9.1 Location

Farm Management and Technology Program
Faculty of Agricultural and Environmental Sciences
Macdonald Campus of McGill University
21,111 Lakeshore Road, Harrison House
Sainte-Anne-de-Bellevue, Quebec H9X 3V9

Telephone: 514-398-7814
Fax: 514-398-7955
Email: *fmt.macdonald@mcgill.ca*
Website: *www.mcgill.ca/fmt*

9.2 Farm Management and Technology Program Faculty

Director

Peter Enright

Associate Director

Serge Lussier

Faculty Lecturers

Caroline Begg

Christian Molgat

Pascal Thériault

David Wees

9.3 Diploma Farm Management Technology

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

The educational goals of the program are:

1. to make our graduates competent in the exercise of their profession;

2. to help the student's integration into professional life;

3. to foster professional mobility;

4. to foster a need for continual development of professional knowledge.

Program Overview

Six academic terms are spent on the Macdonald Campus studying a sequence of courses in soil, plant science, animal science, engineering, economics, and management. The first summer of the program includes a 13-week internship on an agricultural enterprise other than the home farm, or an agricultural business where the student learns the many skills and encounters the many problems related to modern commercial agriculture. Students prepare for their Enterprise internship during both academic semesters of Year 1 through two Farm Practice courses.

During the second summer, students are registered in Entrepreneurship 1, which involves agricultural enterprises. The students will be responsible for data collection to be used in their Farm Project and the Nutrient Management Plan 2 when they return to campus for the Fall semester. The internships and practicums will enable the students to relate their academic work to the reality of farming and the agri-food sector.

Finally, courses in English, Français, Humanities, Physical Education, and two complementary courses taken during the program will entitle the student to receive a Diplôme d'études collégiales (DEC) from the MESRST. Students will also receive a certification from Macdonald campus stating that they have successfully completed the requirements of the Farm Management and Technology program.

Program Outline

Administrative Unit

FMTP 001	(1.33)	Farm Practice 1 (152-001-MC)
FMTP 007	(2)	Health and Farm Safety (152-007-MC)
FMTP 011	(1.33)	Farm Practice 2 (152-011-MC)
FMTP 036	(6)	Enterprise Internship (152-036-MC)
FMTP 037	(2.33)	Entrepreneurship 1 (152-037-MC)

Bioresource Engineering

FMTP 003	(2)	Soil Preparation (152-003-MC)
FMTP 004	(1.67)	Microcomputing (152-004-MC)
FMTP 014	(1.67)	Machinery Management (152-014-MC)
FMTP 018	(1.33)	Building Maintenance (152-018-MC)
FMTP 019	(1.67)	Tools & Machinery Maintenance (152-019-MC)
FMTP 021	(2)	Water and Soil Conservation (152-021-MC)
FMTP 024	(1.67)	Farm Building Planning (152-024-MC)
FMTP 027	(1.33)	Precision Farming (152-027-MC)

Agricultural Economics

FMTP 002	(1.33)	Introduction to Economics (152-002-MC)
FMTP 025	(2)	Farm Project (152-025-MC)
		Financial and Managerial Ac.464 Tm((2n)Tj(ools & Machi/8ed3N52 ctE.744 Tm(Ac.464 Tm((2n3.0,(ools &4m(FMTP

Français

FMTP 075	(2)	Langue française et communication (602-101-03)
FMTP 098	(2)	Français agricole (602-VSG-MC)

Humanities

FMTP 085	(2.33)	Humanities 1: Knowledge (345-103-04)
FMTP 086	(2)	Humanities 2: World Views (345-102-03)
FMTP 087	(2)	Humanities 3:Env.& Org. Issues (345-VSH-MC)

Natural Resource Sciences

FMTP 009	(2.67)	Soil Fertilization (152-009-MC)
FMTP 040	(1.67)	Nutrient Management Plan 1 (152-040-MC)
FMTP 041	(1.33)	Nutrient Management Plan 2 (152-041-MC)

Physical Education

FMTP 090	(1)	Physical Activity and Health (109-101-MQ)
FMTP 091	(1)	Physical Activity and Effectiveness (109-102-MQ)
FMTP 095	(1)	Active Living (109-105-02)

Plant Science

FMTP 006	(2.67)	Agricultural Botany
FMTP 017	(1.33)	Pesticide Use

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

FMTP 028	(2.67)	Dairy Heifer Management (152-028-MC)
FMTP 029	(2.67)	Dairy Herd Management (152-029-MC)
FMTP 030	(2.67)	Swine and Poultry (152-030-MC)
FMTP 031	(2.67)	Beef and Sheep (152-031-MC)

Plant Science Category

FMTP 032	(2.67)	Fruit and Vegetable Crops (152-032-MC)
FMTP 033	(2.67)	Greenhouse Crops (152-033-MC)
FMTP 045	(2.67)	Field Crop Production (152-045-MC)
FMTP 046	(2.67)	Field Crop Management (152-046-MC)

Complementary Courses*

Students must take the following complementary courses to meet the program requirements:

Examinations and other work in courses will be marked according to the percentage system. The minimum passing mark in a course is 60%.

When a student's cumulative percent average (CPA) or semestrial percent average (SPA) first drops below 60%, or they fail four or more courses in a semester, withdrawal is advised. Students who choose to remain in the program are on probation.

Students on probation are normally permitted to register for no more than 10 credits per semester. They are not permitted to be on probation for more than one semester unless they obtain an SPA of 70% or higher.

Students who do not raise their CPA to 60% (or obtain an SPA of 70%) while on probation are not permitted to continue. They are required to withdraw from the program for one year. If, after this period, students wish to be readmitted, they must apply in writing to the Director of the program.

9.6.4 Handbook on Student Rights and Responsibilities

This *Handbook* is a compendium of regulations and policies governing student rights and responsibilities at McGill University. It is published jointly by the Dean of Students' Office and the Secretariat.

11.3 Department of Bioresource Engineering Faculty

Chair

Shiv O. Prasher

Emeritus Professors

Robert S. Broughton; B.S.A., B.A.Sc.(Tor

Emeritus Professor

William D. Marshall; B.Sc.(New Br.), Ph.D.(McM.)

13 Department of Natural Resource Sciences

13.1 Location

Macdonald-Stewart Building, Room MS3-040
McGill University, Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec H9X 3V9
Canada

Telephone: 514-398-7890
Fax: 514-398-7990
Email: *info@nrs.mcgill.ca*
Website: *www.mcgill.ca/nrs*

13.2 About the Department of Natural Resource Sciences

Our environment is comprised of many interacting components: interactions between the earth's atmosphere and forests or crops, between plants and other organisms in the soil, between soil properties and nutrients available to plants, between vegetation and the wildlife it supports, between ecological communities on the land and those of the rivers and lakes nearby, between microbial organisms and food, between insects, plants and animals, between human activities such as agriculture, forestry, and industrial development, and natural ecological processes. In turn, all these processes are greatly affected by the actions of governments that rely primarily on feedback from societal and industrial groups, economists, and policy experts to provide guidelines for the management of our natural resources.

The courses and academic programs offered by the Department of Natural Resource Sciences allow students to explore interactions among the components of terrestrial and aquatic ecosystems, and governance through the development of a strong, interdisciplinary background in fundamental, applied, and social sciences.

13.3 Department of Natural Resource Sciences Faculty

Emeritus Professors

Nayana N. Barthakur; B.Sc.(Gauh.), M.Sc.(Alld.), Ph.D.(Sask.) (*Agricultural Physics*)

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

Angus F. Mackenzie; B.S.A., M.Sc.(Sask.), Ph.D.(C'nell) (*Soil Science*)

Robert A. MacLeod; B.A., M.A.(Br. Col.), Ph.D.(Wisc.), F.R.S.C. (*Microbiology*)

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

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

Chair

James W. Fyles

Professors

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

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

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

Professors

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

Associate Professors

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

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

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

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

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

John Henning; B.Sc., Ph.D.(Guelph) (*Agricultural Economics*)

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

David J. Lewis; B.Sc., M.Sc., Ph.D.(Nfld.) (*Entomology*)

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

Paul Thomassin; B.Sc.(McG.), M.S., Ph.D.(Hawaii Pac.) (*Agricultural and Environmental Economics*)

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

T

Adjunct Professors

James Macdonald

Joe Nocera

Geoffrey Sunahara

14 Department of Plant Science

14.1 Location

Raymond Building, Room R2-019
McGill University, Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec H9X 3V9
Canada

Telephone: 514-398-7851
Fax: 514-398-7897
Email: *plant.science@mcgill.ca*
Website: *www.mcgill.ca/plant*

14.2 About the Department of Plant Science

Our understanding of biological systems has advanced exponentially during the 20th century, and technological developments now allow us to pose questions that simply could not be asked a few decades ago. We also live at a time of great challenges: the human population is now close to 7 billion and continues to rise at an alarming rate, the climate is changing, worldwide energy availability is going down, quality freshwater is getting scarce, biodiversity is disappearing, and a number of wild habitats are threatened by human activities.

Plant scientists have a crucial role to play in solving se

Associate Professors

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

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

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

15.2 About the School of Dietetics and Human Nutrition

Health and well-being of individuals in relation to food choices and physiological status prevails as the unifying theme of the programs in the School of Dietetics and Human Nutrition. The availability of food, normal metabolism and clinical nutrition, community nutrition at the local and international level, the evaluation of nutritional products and their use in nutrition, and the communication of information about food and health form the core of academic programs.

15.3 School of Dietetics and Human Nutrition Faculty

Revision, August 2013. Start of revision.

Director

Kristine G. Koski

Professor Emerita

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

Professors

Luis B. Agellon; B.Sc., Ph.D.(McM.) (*Canada Research Chair*)

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

Linda Wykes; B.Sc., M.Sc., Ph.D.(Tor.) (*William Dawson Scholar*)

Associate Professors

Katherine Gray-Donald; B.Sc., Ph.D.(McG.), R.D.

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

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

Grace S. Marquis; B.A.(Ind.), M.Sc.(Mich. St.), Ph.D.(C'nell) (*Canada Research Chair*)

Hugo Melgar-Quiñonez; M.D., Dr.Sc.(Friedrich Schiller Univ.)

Louise Thibault; B.Sc., M.Sc., Ph.D.(Laval), Dt. P.

Hope Weiler; B.A.Sc.(Guelph), Ph.D.(McM.), R.D. (*Canada Research Chair*)

Lecturers

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

Lynda Fraser (PT); B.A., M.Ed.(Dal.)

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

Angel Ong; B.Sc., M.Sc.(McG.), Dt.P.

Maureen Rose; B.Sc., M.Ed., Ph.D.(McG.), Dt. P.

Joane Routhier; B.Sc.(McG.)

Sandy Phillips; B.Sc., M.Sc.(A.)(McG.), Dt. P.

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

Adjunct Professors

Laurie H.M. Chan; B.Sc., M.Phil.(HK), Ph.D.(Queen Mary, Lond.)

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

Grace Egeland; B.A.(Iowa), Ph.D.(Pitt.)

Cross-Appointed Staff

Food Science and Agricultural Chemistry: Selim Kermasha

Cross-Appointed Staff

Medicine: Ross Andersen, Louis Beaumier, Franco Carli, Stephanie Chevalier, Réjeanne Gougeon, L. John Hoffer, Larry Lands, Ralph Lattermann, Errol Marliss, José Morais, Celia Rodd, Thomas Schricker, Jean-François Yale

Parasitology: Marilyn E. Scott

Revision, August 2013. End of revision.

16 Institute of Parasitology

16.1 Location

Institute of Parasitology
Parasitology Building
McGill University, Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec H9X 3V9
Canada

Telephone: 514-398-7722
Fax: 514-398-7857
Email: *graduate.parasitology@mcgill.ca*
Website: *www.mcgill.ca/parasitology*

16.2 Institute of Parasitology Faculty

Director

Timothy Geary

Professors

John Dalton; B.Sc., Ph.D.(Dublin) (*Canada Research Chair in Infectious Diseases*)

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

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

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

Associate Professors

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

Elias Georges; B.Sc., Ph.D.(McG.)

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

Paula Ribeiro; B.Sc., Ph.D.(York)

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

Assistant Professor

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

Associate Members

Greg Matlashewski; B.Sc.(C'dia), Ph.D.(Ott.)

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

Associate Members

Mary Stevenson; B.A.(Hood College, Maryland), M.S., Ph.D.(Catholic Univ. of America, Washington DC)

Brian Ward; M.Sc.(Oxf.), M.D.,C.M.(McG.), DTM & H(Doctor of Tropical Medicine and Hygiene)(Lond.)

Adjunct Professors

Florence Dzierszinski; B.Sc., M.Sc., Ph.D.(Lille, France)

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

David Marcogliese; B.Sc.(C'dia), M.Sc.(Dal.), Ph.D.(Wake Forest Univ. N. Carolina)

17 Instructional Staff

Instructional Staff

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

Adamowski, Jan; B.Eng.(RMC), M.Phil.(Camb./MIT), M.B.A.(Warsaw/HEC Paris/London Business School/Norwegian School of Economics and Business Administration), Ph.D.(Warsaw); Assistant Professor of Bioresource Engineering

Agellon, Luis B.; B.Sc., Ph.D.(McM.); Professor of Human Nutrition (*Canada Research Chair*)

Alli, Inteaz; B.Sc.(Guyana), M.Sc., Ph.D.(McG.); Professor of Food Science and Agricultural Chemistry

Bede, Jacqueline; B.Sc.(Calg.), M.Sc., Ph.D.(Tor.); Associate Professor of Plant Science

Beech, Robin N.; B.Sc.(Nott.), Ph.D.(Edin.); Associate Professor of Parasitology

Begg, Caroline; B.Sc.(Agr.)(McG.), M.Sc.(Sask.), Ph.D.(McG.); Faculty Lecturer, Department of Plant Science

Bennett, Elena; B.A.(Oberlin), M.Sc., Ph.D.(Wisc.); Associate Professor of Ecosystem Ecology and McGill School of Environment

Bird, David M.; B.Sc.(Guelph), M.Sc., Ph.D.(McG.); Fellow A.O.U., Professor of Wildlife Biology and Director, Avian Science and Conservation Centre

Bordignon, Vilceu; Ag.Tec.(EAPC), M.Sc., D.V.M.(Universidade da Região da Campanha (Brazil)), Ph.D.(Montr.); Associate Professor of Animal Science

Brown, Peter G.; B.A.(Haver.), M.A., Ph.D.(Col.); Professor of Natural Resource Sciences (*joint appoint. with Geography and McGill School of Environment*)

Buddle, Christopher; B.Sc.(Guelph), Ph.D.(Alta.); Associate Professor of Forest Insect Ecology

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