



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

**Programs, Courses and University Regulations
2010-2011**

Publication Information

Published by

Enrolment Services

845 Sherbrooke Street West
Montreal, Quebec, H3A 2T5
Canada

Managing Editor

Bonnie Borenstein
Enrolment Services

All contents copyright © 2010 by McGill University. All rights reserved, including the right to reproduce this publication, or portions thereof, in any form.

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

The web version is the most current version of this publication.

Not all courses are offered every year and changes can be made after publication. Always check the Minerv

- 1 About the Faculty of Agricultural and Environmental Sciences, including School of Dietetics and Human Nutrition , page 13
- 2 History of the Faculty , page 13
- 3 Macdonald Campus Facilities, page 13
 - 3.1 Morgan Arboretum, page 13
 - 3.2 Macdonald Campus Library, page 13
 - 3.3 Macdonald Campus Computing Centre, page 13
 - 3.4 Lyman Entomological Museum and Research Laboratory, page 14
 - 3.5 Brace Centre for Water Resources Management, page 14
- 4 About the Faculty of Agricultural and Environmental Sciences, including School of Dietetics and Human Nutrition (Undergraduate), page 14
 - 4.1 Location, page 14
 - 4.2 Administrative Officers, page 14
 - 4.3 Faculty Admission Requirements, page 15
 - 4.4 Student Information, page 15
 - 4.4.1 The Student Affairs Office, page 15
 - 4.4.2 Student Services, page 15
 - 4.4.3 Macdonald Campus Residences, page 15
 - 4.4.4 Student Life, page 16
 - 4.4.5 Student Rights and Responsibilities, page 16
 - 4.4.6 Fees, page 16
 - 4.4.6.1 Tuition Fees, page 16
 - 4.4.6.2 Other Expenses, page 16
 - 4.4.7 Scholarships and Bursaries, page 16
 - 4.4.8 Immunization for Dietetics Majors, page 16
 - 4.4.9 Language Requirement for Professions, page 16
 - 4.5 Faculty Information and Regulations, page 17
 - 4.5.1 Minimum Credit Requirement, page 17
 - 4.5.2 Minimum Grade Requirement, page 17
 - 4.5.3 Academic Advisers, page 17
 - 4.5.4 Categories of Students, page 17
 - 4.5.4.1 Full-Time Students , page 17
 - 4.5.4.2 Part-time Students , page 17
 - 4.5.5 Academic Standing, page 17
 - 4.5.5.1 Committee on Academic Standing, page 18
 - 4.5.6 Credit System, page 18
 - 4.5.6.1 Continuing Education Courses, page 18
 - 4.5.7 Academic Credit Transfer, page 18
 - 4.5.8 Regulations Regarding Second Academic Majors, page 18
 - 4.5.8.1 Procedures for Minor Programs, page 18
 - 4.5.9 Course Change Information, page 19
 - 4.5.10 Graduate Courses Available to Undergraduates, page 19

- 4.5.11 Attendance and Conduct in Class, page 19
- 4.5.12 Incomplete Grades, page 19
- 4.5.13 Examinations, page 19
 - 4.5.13.1 Reassessments and Rereads, page 19
 - 4.5.13.2 Deferred Examinations, page 20
- 4.5.14 Degree Requirements, page 20
- 4.5.15 Dean's Honour List, page 20
- 4.5.16 Distinction, page 20
- 4.5.17 Honours and First Class Honours, page 20
- 4.5.18 Medals and Prizes, page 20
- 5 Overview of Programs Offered by the Faculty of Agricultural and Environmental Sciences, page 20
 - 5.1 Internship Opportunities and Co-op Experience, page 21
 - 5.1.1 FAES 200/300 Internship Program, page 21
 - 5.1.2 AGRI 310 Internship in Agriculture/Environment, page 21
 - 5.1.3 AGRI 410 D1 and D2 Internship and Co-op Experience, page 21

6.1.5 Concurrent Bachelor of Science Food Science (B.Sc. (F

- 6.2.7.11 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Environmental Biology (Multidisciplinary) (24 credits), page 45
- 6.2.7.12 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Environmental Economics (24 credits), page 46
- 6.2.7.13 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Health and Nutrition (24 credits), page 47
- 6.2.7.14 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - International Agriculture (24 credits), page 47
- 6.2.7.15 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - International Development (IAFS) (24 credits), page 48
- 6.2.7.16 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Life Sciences (Multidisciplinary) (24 credits), page 50
- 6.2.7.17 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Microbiology (24 credits), page 52
- 6.2.7.18 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Molecular Biotechnology (24 credits), page 53
- 6.2.7.19 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Plant Biology (24 credits), page 53
- 6.2.7.20 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Plant Production (24 credits), page 54
- 6.2.7.21 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Plant Protection (24 credits), page 55
- 6.2.7.22 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Professional Agrology (21 credits), page 55
- 6.2.7.23 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Soil and Water Resources (24 credits), page 56
- 6.2.7.24 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Wildlife Biology (24 credits), page 57
- 6.3 Bachelor of Engineering (Bioresource) - B.Eng.(Bioresource), page 58
 - 6.3.1 Bioresource Engineering Major, page 58
 - 6.3.2 About the B.Eng. (Bioresource) Program, page 58
 - 6.3.3 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Major Bioresource Engineering (113 credits), page 58
 - 6.3.4 Bachelor of Engineering (Bioresource) (B.Eng.(Bioresource)) - Major Bioresource Engineering - Professional Agrology (113 credits), page 61
 - 6.3.5 Bachelor of Engineering (Bioresource) - B.Eng.(Bioresource) Related Programs, page 64
 - 6.3.5.1 Minor in Environmental Engineering, page page 6.3.5.1

-
- 6.4.1 Bachelor of Science (Food Science) (B.Sc.(F.Sc.)) - Major Food Science - Food Science Option (90 credits), page 64
 - 6.4.2 Bachelor of Science (Food Science) (B.Sc.(F.Sc.)) - Major Food Science - Food Chemistry Option (90 credits), page 65
 - 6.4.3 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 (122 credits), page 66
 - 6.4.3.1 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, page 68
 - 6.4.4 Bachelor of Science (Food Science) - B.Sc.(F.Sc.) Related Programs, page 68
 - 6.4.4.1 Certificate in Food Science, page 68
 - 6.5 Bachelor of Science (Nutritional Sciences) - B.Sc.(Nutr.Sc.), page 68
 - 6.5.1 Dietetics Major, page 68
 - 6.5.2 Nutrition Major, page 68
 - 6.5.3 About the B.Sc. (Nutritional Sciences) Program, page 68
 - 6.5.4 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Dietetics (115 credits), page 69
 - 6.5.5 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Food Function and Safety (90 credits), page 71
 - 6.5.6 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Global Nutrition (90 credits), page 72
 - 6.5.7 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Nutritional Biochemistry (90 credits), page 73
 - 6.5.8 Bachelor of Science (Nutritional Sciences) (B.Sc.(Nutr.Sc.)) - Major Nutrition - Sports Nutrition (90 credits), page 75
 - 6.5.9 Bachelor of Science (Nutritional Sciences) - Related Programs, page 76
 - 6.5.9.1 Minor in Human Nutrition, page 76
 - 6.5.9.2 Concurrent Bachelor of Science in Food Science - B.Sc.(F.Sc.) and Bachelor of Science in Nutritional Sciences - B.Sc.(Nutr.Sc.) - Food Science/Nutritional Science Major, page 76
 - 6.6 Minor Programs, page 76
 - 6.6.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Minor Agricultural Production (24 credits), page 77
 - 6.6.2 Minor Animal Biology (24 credits), page 77
 - 6.6.3 Minor Animal Health and Disease (24 credits), page 78
 - 6.6.4 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Minor Ecological Agriculture (24 credits), page 79
 - 6.6.5 Minor in Entrepreneurship, page 80
 - 6.6.6 Minor in Environmental Engineering (27 credits), page 80
 - 6.6.7 Minor Human Nutrition (24 credits), page 80
 - 6.7 Post-Baccalaureate Certificate Programs, page 81
 - 6.7.1 Certificate in Ecological Agriculture (30 credits), page 81
 - 6.7.2 Certificate in Entrepreneurship, page 82
 - 6.7.3 Certificate in Food Science (30 credits), page 82
 - 6.8 Field Studies, page 84
 - 6.8.1 African Field Study Semester , page 84
 - 6.8.2 Barbados Field Study Semester , page 84

-
- 14 School of Dietetics and Human Nutrition, page 97
 - 14.1 Location, page 97
 - 14.2 About the School of Dietetics and Human Nutrition, page 97
 - 14.3 School of Dietetics and Human Nutrition Faculty, page 97
 - 15 Institute of Parasitology, page 98
 - 15.1 Location, page 98
 - 15.2 Institute of Parasitology Faculty, page 99
 - 16 Instructional Staff, page 99

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

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 impro

3.4 Lyman Entomological Museum and Research Laboratory

Originally established in 1914 and formerly housed in the Redpath Museum, the Lyman Entomological Museum was moved to the Macdonald Campus in 1961. It houses the largest university collection of insects in Canada, second in size only to the National Collection. The Museum also has an active graduate research program in association with the Department of Natural Resource Sciences. Study facilities are available, on request from the Curator, to all bona fide students of entomology.

William H. Hendershot; B.Sc.(Tor.), M.Sc.(McG.), Ph.D.(Br. Col.)	Associate Dean (Academic)
Suha Jabaji; B.Sc.(AUB), M.Sc.(Guelph), Ph.D.(Wat.)	Associate Dean (Research and Graduate Education)
David J. Lewis; B.Sc., M.Sc., Ph.D.(Mem.)	Associate Dean (Student Affairs)
Silvana Pellecchia	Manager, Student Affairs
Gary O'Connell; B.Comm.(C'dia)	Director, Academic and Administrative Services
William R. Ellyett; B.A.(Sir G. Wms.), B.Ed.(Phys.Ed.)(McG.)	Director of Athletics
Paul Meldrum; B.J.(Hons.)(Car.)	General Manager, Macdonald Campus Farm
Ginette Legault	Manager, Campus Housing
Peter D.L. Knox; B.Sc.(Agr.)(McG.)	Supervisor, Property Maintenance

4.3 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/undergrad.

For information about inter-faculty transfers, see *University Information and Regulations > Inter-Faculty 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/undergrad.

4.4 Student Information

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

4.4.1 The Student Affairs Office

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

Website: www.mcgill.ca/macdonald/studentinfo/sao

4.4.2 Student Services

Students who study on the Macdonald Campus can make full use of all McGill Student Services, see *University Regulations and General Information > Support for Students*. The Office of the Executive Director, Services for Students, gives you direct access to several services, see *University Regulations and General Information > Student Services – Macdonald Campus*.

For further information, refer to the Macdonald Campus Student Services website, www.mcgill.ca/macdonald-studentservices, and the Student Services website, www.mcgill.ca/studentservices.

4.4.3 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 *University Regulations and General Information > Residential Facilities > University Residences – Macdonald Campus*, www.mcgill.ca/macdonald-residences, or email residences.macdonald@mcgill.ca.

4.4.4 Student Life

All undergraduate, postgraduate, and Farm Management and Technology students are members of the Macdonald Campus Students' Society. The MCSS,

4.5 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.

4.5.1 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 6.1: 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.), you must take a minimum of two-thirds of your course credits within the Faculty of Agricultural and Environmental Sciences.

4.5.2 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.

4.5.3 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.

4.5.4 Categories of Students

4.5.4.1 Full-Time Students

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.

4.5.5.1 Committee on Academic Standing

The Faculty's Committee on Academic Standing, consisting of academic staff, administrative staff and a student representative, reviews special requests

4.5.9 Course Change Information

1. Courses: please refer to *University Regulations and General Information > Registration > Course Change Period*, and the Important Dates website www.mcgill.ca/importantdates.
2. Course withdrawal (Transcript notation of “W”): please refer to *University Regulations and General Information > Registration > Regulations Concerning Course Withdrawal*, and the Important Dates website www.mcgill.ca/importantdates.
3. Other changes: Information about changes may be obtained from the Student Affairs Office of the Faculty.

4.5.10 Graduate Courses Available to Undergraduates

Undergraduates who want to take graduate courses must have a cumulative grade point average (CGPA) of at least 3.20. Final approval must be obtained from Graduate and Postdoctoral Studies.

4.5.11 Attendance and Conduct in Class

Matters of discipline connected with, or arising from, the general arrangement for teaching are under the jurisdiction of the Dean of the Faculty.

Students may be admonished by a professor or instructor for dishonest or improper conduct. If disciplinary action is required, it must be reported to the Associate Dean (Student Affairs).

Punctual attendance at all classes, laboratory periods, tests, etc., is expected of all students.

4.5.12 Incomplete Grades

An instructor who believes that there is justification for a student to delay submitting term work may extend the deadline until after the end of the course. In this case, the instructor will submit a grade of K (incomplete), indicating the date by which the work is to be completed. The maximum extensions for the submission of grades to the Student Affairs Office are as follows:

Students graduating in June	
Fall courses	January 15
Winter courses, and courses spanning Fall/Winter	April 30

Non-graduating students	
Fall courses	January 15
Winter courses, and courses spanning Fall/Winter	May 15

Students' deadlines for submitting their work must be sufficiently in advance of these dates to ensure that the work can be graded and the mark submitted on time. It is important to note that instructors may impose earlier deadlines than those listed above.

If marks to clear Ks have not been submitted to the Student Affairs Office by the above dates, the K is automatically changed to a KF and counts as an F in the GPA.

Students with a grade of K who have serious extenuating circumstances may request an extension of the K deadline (KE) from the Associate Dean (Student Affairs). Please refer to *University Regulations and General Information > Student Records* 4.903 353.244 Tm(all 66.8.552 255.984 GRecon)Tj1 0 00 10778.48 255.984 T

- 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.

4.5.13.2 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 period. Verify dates on the Important Dates website at www.mcgill.ca/importantdates, apply on Minerva and provide medical documentation to the Student Affairs Office.

4.5.14 Degree Requirements

To be eligible for a B.Eng.(Bioresource), B.Sc.(Ag.Env.Sc.), B.Sc.(F.Sc.), or Concurrent B.Sc.(F.Sc.) and B.Sc.(Nutr.Sc.) degree, you must have passed, or achieved exemption, with a minimum grade of C in all required and complementary courses of the program. You must also have a CGPA of at least 2.00.

In addition, if you are a student in the Dietetics program, you must have completed the Stages of professional formation requiring a CGPA of 3.00.

You must have completed all Faculty and program requirements; see the [section 4.5.1: Minimum Credit Requirement](#) section of this publication.

In order to qualify for a McGill degree, you must complete a minimum residency requirement of 60 credits at McGill. If you are in the B.Sc.(Ag.Env.Sc.), you must take a minimum of 2/3 of your course credits within the Faculty of Agricultural and Environmental Sciences.

4.5.15 Dean's Honour List

For information on the designation of Dean's Honour List awarded at graduation, see the *University Regulations and General Information > Dean's Honour List* section in this publication.

4.5.16 Distinction

Institutes of Agriculture); Bioresource Engineering (membership as a professional Engineer in any province of Canada plus the *Ordre des agronomes du Québec*); Food Science (accreditation by the Institute of Food Technologists and professional accreditation by the *Ordre des chimistes du Québec*). Professional Practice experiences to complete the dietetics practicum are provided in the McGill teaching hospitals and in a wide v

5.2 Exchange Programs

The Faculty of Agricultural and Environmental Sciences participates in all University-wide student exchange programs available at McGill and also has Faculty-specific exchange programs. For more information, see *Field Studies and Study Abroad > Exchange Programs*.

5.3 Bachelor of Science in Agriculture and Environmental Sciences - B.Sc.(Ag.Env.Sc.)

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

5.3.1 Major Programs

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

Agricultural Economics*:

- Agribusiness Option
- Environmental Economics Option

Agro-Environmental Sciences*

Environmental Biology

Environment, under McGill School of Environment:

- Biodiversity and Conservation Domain
- Ecological Determinants of Health Domain
- Environmetrics Domain
- F

Molecular Biotechnology
Plant Biology
Plant Production
Plant Protection
Professional Agrology
Soil and Water Resources
Wildlife Biology

1 Only available to students in the International Agriculture and Food Systems Major.

Pre 2009-2010

The programs listed below were in effect until the 2008-2009 academic year, with the exception of Agricultural Economics and Environment. Please go to the appropriate Calendar for program requirements or consult your academic adviser.

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

Agricultural Sciences*:

Agricultural Biotechnology Option
Ecological Agriculture Option

This normally leads to professional qualification in any provincial professional engineering order plus the *Ordre des agronomes du Québec*.

Bioresource Engineering:

Agricultural Engineering Stream

BioEnvironmental Engineering Stream

Ecological Engineering Stream

Food and Bioprocess Engineering Stream

Soil and Water Engineering Stream

Professional Agrology Stream BTfF651.Scien(B- B.Sc. 651.46 Tm(F)27bec 0574.866.319 .Sc.)8.56 Tm(gr)T356 s74.866.319 5.5s du Québec)Tj/F1 8.1 719.5554

Animal Biology
Animal Health and Disease
Ecological Agriculture
Minor in Environment, under McGill School of Environment
Environmental Engineering
Human Nutrition

5.10 Post-Baccalaureate Certificate Programs

The Faculty offers the following post-baccalaureate certificate programs.

Ecological Agriculture

Food Science

Environmental Science and Environmental Sciences, the Faculty of Arts, the Faculty of Science, and the Faculty of Law. The Faculty offers a B.Sc. Major in Environment, a B.A. & Sc. Inter-Faculty Program in Environment, a B.A. Faculty of Science Major in Environment, a B.Sc. Minor in Environment, and a Diploma in Environment. Many of the MSE programs allow you to choose to study exclusively on the Macdonald Campus or on the Montreal Campus, or you can take advantage of both.

The B.Sc. Major in Environment is given under [section 6.2: Bachelor of Science \(Agricultural and Environmental Sciences\) – B.Sc.\(Ag.Env.Sc.\)](#). The B.A. & Sc. Inter-Faculty Program in Environment is given under *McGill School of Environment* and on the MSE website: www.mcgill.ca/mse.

Integrated Environmental Science Programs on the Macdonald Campus

Integrated environmental science programs are also offered on the Macdonald Campus, particularly within the B.Sc.(Ag.Env.Sc.) and B.Sc.(Ag.Env.Sc.) (Resource) degrees. The objective of these interdepartmental programs is to provide you with a well-rounded training in a specific interdisciplinary area, as well as the basis for managing natural resources. For a complete list of the programs, see [section 5: Overview of Programs Off 1 Tm\(A 155 215.878 197.022 Tm\)](#).

6.1 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. (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: Mathematical skill level will be determined during the first week of classes. The freshman adviser may recommend students register for an additional weekly Precalculus Lab, of one credit, which may be applied towards the required credits of the degree program.

Freshman Adviser: Dr. Alice Cherestes

Macdonald-Stewart Building, Room 1-023

Telephone: 514-398-7980

Required Courses - Fall (14 credits)

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

Required Courses - Winter (13 credits)

AEBI 122	(3)	Cell Biology
AEHM 205	(3)	Science Literacy
AEMA 102	(4)	Calculus 2
AGEC 201**	(3)	Principles of Macroeconomics

Complementary Courses - Winter (3 credits)

One of the following:

AGRI 120	(3)	Exobiospheres
BREE 103	(3)	Linear Algebra
NUTR 301	(3)	Psychology

Advising Notes:

* Freshman students intending to major in Agricultural Economics in the B.Sc. (Ag. & Env. Sci.) degree program should note that the courses AEBI 120/GRI 120

Required Courses - F

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.

Freshman Adviser: Mrs. Judy Campbell-Gordon

Macdonald-Stewart Building, Room 2-019

Telephone: 514-398-7974

Required Courses - Fall (14.5 credits)

AEBI 120 (3) General Biology

AEBI 122	(3)	Cell Biology
AEMA 102	(4)	Calculus 2

- Molecular Biotechnology, [section 6.2.7.18: Bachelor of Science \(Agricultural and Environmental Sciences\) \(B.Sc.\(Ag.Env.Sc.\)\) - Molecular Biotechnology \(24 credits\)](#)
- Plant Biology

Electives

To meet the minimum credit requirement for the degree.

6.2.3 B.Sc.(Ag.Env.Sc.) – Agro-environmental Sciences Major



(3) Dairy and Beef Production Management

ENVB 210	(3)	The Biophysical Environment
ENVB 222	(3)	St. Lawrence Ecosystems
ENVB 410	(3)	Ecosystem Ecology
LSCI 204	(3)	Genetics
		g0ENVB 410

6.2.5 B.Sc.(Ag.Env.Sc.) – International Agriculture and Food Systems Major

Program Director

Professor Anwar Naseem
Macdonald-Stewart Building, room 3-037
Telephone: 514-398-7825

6.2.5.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Major International Agriculture and Food Systems (42 credits)

This program is directed at students who seek conceptual understanding of the scope of and inter-relationships among the environmental, economic and socio-cultural factors that shape the nature of developing country food systems as well as scientific competence in the ways in which agriculture can help define sustainable solutions to critical problems defined by food insecurity, malnutrition, poverty and ecological health. Students will be given general preparation sufficient for participation in project management and policy development together with a foundation adequate both for working alongside a range of development specialists and for subsequent acquisition of specific expertise in components of agricultural and food science. The program includes a common core of scientific and development-related courses.

Program Director: Professor Anwar Naseem
Macdonald-Stewart Building, Room 3-037
514-398-7825

Program Prerequisites

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

Required Courses (30 credits)

AEMA 310	(3)	Statistical Methods 1
AGEC 200	(3)	Principles of Microeconomics
AGEC 442	(3)	Economics of International Agricultural Development
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
AGRI 493	(3)	International Project Management
ENVB 210	(3)	The Biophysical Environment
FDSC 200	(3)	Introduction to Food Science
LSCI 211	(3)	Biochemistry 1
NRSC 340	(3)	Global Perspectives on Food
PLNT 203	(3)	Economic Botany

Complementary Courses (12 credits)

Select the complementary courses as follows:

One of: 340

FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 230	(3)	Introductory Microbiology
NUTR 501	(3)	Nutrition in Developing Countries
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation
PLNT 434	(3)	Weed Biology and Control
WILD 424	(3)	Parasitology

Specialization

Students should also complete at least two specializations of 18-24 credits, one of which should be the Specialization in International Development.

Specializations designed to be taken with the International Agriculture and Food Systems Major:

- Agricultural Economics
- Agriculture and Food Systems (Multidisciplinary)
- Animal Production
- Ecological Agriculture
- Health and Nutrition
- International Development (for IAFS students)
- Plant Production
- Soil and Water Resources

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 publication. Consult academic adviser for approval of specializations other than those listed above.

Electives

To meet the minimum credit requirement for the degree.

6.2.6 B.Sc.(Ag.Env.Sc.) – Life Sciences (Biological and Agricultural) Major

Program Director

Professor Brian Driscoll
Macdonald-Stewart Building, room 3-035
Telephone: 514-398-7887

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

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

Program Director: Professor Brian Driscoll
Macdonald-Stewart Building, Room 3-035
Telephone: 514-398-7887

Program Prerequisites

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

Required Courses (27 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
LSCI 202	(3)	Molecular Cell Biology
LSCI 204	(3)	Genetics
LSCI 211	(3)	Biochemistry 1
LSCI 230	(3)	Introductory Microbiology

Complementary Courses (15 credits)

15 credits of the complementary courses selected from:

*MIMM 324 is taught at Downtown campus.

AEBI 451	(3)	Research Project 1
AEBI 491	(1)	Scientific Communication
AEHM 330	(3)	Academic and Scientific Writing
ANSC 234	(3)	Biochemistry 2
ANSC 250	(3)	Principles of Animal Science
ANSC 251	(3)	Comparative Anatomy
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 330	(3)	Fundamentals of Nutrition
ANSC 420	(3)	Animal Biotechnology
BINF 301	(3)	Introduction to Bioinformatics
BTEC 306	(3)	Experiments in Biotechnology
ENVB 222	(3)	St. Lawrence Ecosystems
MICR 331	(3)	Microbial Ecology
MIMM 324	(3)	Fundamental Virology
NRSC 333	(3)	Pollution and Bioremediation
PARA 438	(3)	Immunology
PLNT 203	(3)	Economic Botany
PLNT 304	(3)	Biology of Fungi
PLNT 315	(3)	Herbs and Medicinal Plants
PLNT 353	(3)	Plant Structure and Function
PLNT 424	(3)	Cellular Regulation
PLNT 426	(3)	Plant Ecophysiology
WILD 375	(3)	Issues: Environmental Sciences
WILD 424	(3)	Parasitology

Specialization

At least one specialization of 18-24 credits from:

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

- Animal Biology

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

Note: For a complete list of specializations of

Bachelor of Science (Agricultural and Envir

12 credits from:

AGEC 201	(3)	Principles of Macroeconomics
AGEC 231	(3)	Economic Systems of Agriculture
AGEC 242	(3)	Management Theories and Practices
AGEC 320	(3)	Intermediate Microeconomic Theory
AGEC 330	(3)	Agriculture and Food Markets
AGEC 333	(3)	Resource Economics
AGEC 343	(3)	Accounting and Cost Control
AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
ANSC 323	(3)	Mammalian Physiology
ANSC 424	(3)	Metabolic Endocrinology
ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
ECON 225	(3)	Economics of the Environment
ECON 326	(3)	Ecological Economics
FDSC 251	(3)	Food Chemistry 1
FDSC 319	(3)	Food Commodities
FDSC 330	(3)	Food Processing
LSCI 202	(3)	Molecular Cell Biology
LSCI 230	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology
MICR 341	(3)	Mechanisms of Pathogenicity
MICR 450	(3)	Environmental Microbiology
NRSC 221	(3)	Environment and Health

W

ANSC 451	(3)	Dairy and Beef Production Management
ANSC 458	(3)	Swine and Poultry Production
BREE 217	(3)	Hydrology and Water Resources
ENTO 340	(3)	Field Entomology
ENTO 352	(3)	Control of Insect Pests
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
PLNT 300	(3)	Cropping Systems
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Vegetable Production
PLNT 310	(3)	Plant Propagation
PLNT 312	(3)	Urban Horticulture
PLNT 315	(3)	Herbs and Medicinal Plants
PLNT 321	(3)	Fruit Production
PLNT 322	(3)	Greenhouse Management
PLNT 434	(3)	Weed Biology and Control
SOIL 315	(3)	Soil Fertility and Fertilizer Use

6.2.7.5 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 post-graduate studies in a variety of biology programs, and to work in many laboratory settings.

Specialization Adviser: Professor Roger Cue

Department of Animal Science

Telephone: 514-398-7805

Required Courses (15 credits)

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 420	(3)	Animal Biotechnology
PARA 438	(3)	Immunology

Complementar, N0n0 0 1 125.134 354.9j1 0 0 1 221.949 505.48 Tm(W)Tjs3 Tf1 y lect fur949 505.48 Tu.F:0

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

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

Specialization Adviser: Professor Sarah Kimmins

Macdonald-Stewart Building, Room 1-091

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 of complementary courses selected from:

AEBI 451	(3)	Research Project 1
ANSC 251	(3)	Comparative Anatomy
ANSC 330	(3)	Fundamentals of Nutrition
NUTR 420	(3)	Toxicology and Health Risks
PHAR 300	(3)	Drug Action
WILD 424	(3)	Parasitology

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

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

Specialization Adviser: Professor Arif Mustafa

Macdonald-Stewart Building, Room 1-086

Telephone: 514-398-7506

Required Courses (21 credits)

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

Complementary Courses (3 credits)

One of:

ANSC 234	(3)	Biochemistry 2
----------	-----	----------------

ANSC 330

(3)

Fundamentals of Nutrition

6.2.7.8 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Applied Ecosystem Sciences (24 credits)

The goal of this specialization is to pro

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, do extension and government work, and those intending to pursue postgraduate work in this field.

Academic Adviser: Dr. Caroline Begg

Macdonald-Stewart Building, Room 2-071

Telephone: 514-398-8749

Required Courses (9 credits)

AGRI 210	(3)	Agro-Ecological History
AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture

Complementary Courses (15 credits)

15 credits of Complementary courses selected from:

*Note: Offered in alternate years.

AGEC 333	(3)	Resource Economics
AGRI 310	(3)	Internship in Agriculture/Environment
AGRI 435	(3)	Soil and Water Quality Management
ENTO 352	(3)	Control of Insect Pests
ENTO 446	(3)	Apiculture
MICR 331	(3)	Microbial Ecology
NUTR 512	(3)	Herbs, Foods and Phytochemicals
PLNT 302	(3)	Forage Crops and Pastures
PLNT 312*	(3)	Urban Horticulture
PLNT 315*	(3)	Herbs and Medicinal Plants
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

6.2.7.10 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Entomology (24 credits)

This specialization offers students expertise in insect biology, ecology, evolution and behaviour. Applied entomology is included, as insects are key pests in various ecosystems, and insect pest management is and will continue to be a global priority. Insect taxonomy and systematics will be studied both in the field and in the classroom. Through careful selection of complementary courses, students can learn about the role of insects in various ecosystems, their functional importance, and their role in vectoring human disease.

Specialization Adviser: Christopher Buddle

Macdonald-Stewart Building 2-076

Telephone: 514-398-8026

Required Courses (12 credits)

ENTO 330	(3)	Insect Biology
ENTO 340	(3)	Field Entomology
ENTO 352	(3)	Control of Insect Pests
ENTO 440	(3)	Insect Diversity

Complementary Courses (12 credits)

12 credits of complementary courses selected from:

ENTO 446	(3)	Apiculture
ENTO 515	(3)	Parasitoid Behavioural Ecology
ENTO 520	(3)	Insect Physiology
ENTO 535	(3)	Aquatic Entomology
ENTO 550	(3)	Veterinary and Medical Entomology
PLNT 434	(3)	Weed Biology and Control
SOIL 335	(3)	Soil Ecology and Management
WILD 424	(3)	Parasitology

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

This is a flexible specialization offering a balance between organisms, their ecology

SOIL 335 (3) Soil Ecology and Management

Ecosystem Processes and Applications

Minimum of 6 credits from the following:

AGRI 435	(3)	Soil and Water Quality Management
ENVB 301	(3)	Meteorology
MICR 450	(3)	Environmental Microbiology
NRSC 430	(3)	GIS for Natural Resource Management
NRSC 437	(3)	Assessing Environmental Impact
SOIL 300	(3)	Geosystems
SOIL 326	(3)	Soils in a Changing Environment
WILD 375	(3)	Issues: Environmental Sciences
WILD 421	(3)	Wildlife Conservation

6.2.7.12 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 intended for students in the Major Agricultural Economics.

Specialization Adviser: Professor John Henning

Macdonald-Stewart Building, Room 3-038

514-398-7826

Required Courses (9 credits)

AEMA 406	(3)	Quantitative Methods: Ecology
ENVB 305	(3)	Population & Community Ecology
NRSC 437	(3)	Assessing Environmental Impact

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

6.2.7.13 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Health and Nutrition (24 credits)

This specialization offers students a foundation in nutrition with respect to health and disease. A focus on nutrition and health through the lifespan examines nutrient requirements and their relationship with health and disease prevention. Through careful selection of complementary courses, students can study about health and disease in various contexts ranging from human to animal health.

Specialization Adviser: Professor Linda Wykes

Macdonald-Stewart Building 2-042

Telephone: 514-398-7843

Required Courses (12 credits)

ANSC 323	(3)	Mammalian Physiology
ANSC 330	(3)	Fundamentals of Nutrition
NUTR 337	(3)	Nutrition Through Life
PARA 438	(3)	Immunology

Complementary Courses (12 credits)

12 credits from:

ANSC 312	(3)	Animal Health and Disease
ANSC 424	(3)	Metabolic Endocrinology
ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
NUTR 344	(4)	Clinical Nutrition 1
NUTR 420	(3)	Toxicology and Health Risks
NUTR 450	(3)	Research Methods: Human Nutrition
NUTR 503	(3)	Bioenergetics and the Lifespan
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation
PLNT 315	(3)	Herbs and Medicinal Plants
WILD 424	(3)	Parasitology

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

This specialization will provide the student with coursework and hands-on experience of techniques and issues related to agriculture in a tropical setting.

18 credits of complementary courses selected as follows:

3 credits, one of the following:

NRSC 340	(3)	Global Perspectives on Food
NUTR 501	(3)	Nutrition in Developing Countries
PARA 515	(3)	Water, Health and Sanitation

15 credits, select one of the McGill Field Study Semesters listed below:

African 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

Panama Field Study Semester (Winter)

15 credits selected as follows:

AGRI 550	(3)	Sustained Tropical Agriculture
BIOL 553	(3)	Neotropical Environments
ENVR 451	(6)	Research in Panama
GEOG 498	(3)	Humans in Tropical Environments

6.2.7.15 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - International Development (IAFS) (24 credits)

The specialization provides a focus on social science offerings from the International Development Studies program offered by the Faculty of Arts for students in the International Agriculture and Food Systems (IAFS) major. The program combines an overview of development and social science course options with opportunity for field experience.

Specialization Adviser: Professor Anwar Naseem

Macdonald-Stewart Building, Room 3-037

Required Course (3 credits)

INTD 200	(3)	Introduction to International Development
----------	-----	---

Complementary Courses (21 credits)

21 credits selected as follows:

3 credits of research or internship coursework

18 credits from one of two streams:

- Economic Development and Living Standards
- Environment and Agricultural Resources

Research or Internship Coursework

3 credits from:

AGRI 498	(3)	Agricultural Development Research
AGRI 499	(3)	Agricultural Development Internship

Economic Development and Living Standards Stream

Students selecting this stream complete 18 credits from:

AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
ANTH 227	(3)	Medical Anthropology
ECON 209	(3)	Macroeconomic Analysis and Applications
ECON 223	(3)	Political Economy of Trade Policy
ECON 326	(3)	Ecological Economics
ECON 336	(3)	The Chinese Economy
ECON 411	(3)	Economic Development: A World Area
ECON 416	(3)	Topics in Economic Development 2
GEOG 310	(3)	Development and Livelihoods
GEOG 403	(3)	Global Health and Environmental Change
GEOG 409	(3)	Geographies of Developing Asia
GEOG 508	(3)	Resources, People and Power
HIST 348	(3)	China: Science-Medicine-Technology
HIST 381	(3)	Colonial Africa: Health/Disease
HIST 396	(3)	Disease in Africa Since 1960
MGCR 360	(3)	Social Context of Business
MGCR 382	(3)	International Business
MGPO 475	(3)	Strategies for Developing Countries
MIME 524	(3)	Mineral Resources Economics
NRSC 340	(3)	Global Perspectives on Food
NRSC 540	(3)	Socio-Cultural Issues in Water
POLI 423	(3)	Politics of Ethno-Nationalism
POLI 445	(3)	International Political Economy: Monetary Relations

SOCI 307	(3)	Sociology of Globalization
SOCI 309	(3)	Health and Illness
SOCI 365	(3)	Health and Development
SOCI 513	(3)	Social Aspects HIV/AIDS in Africa

Environment and Agricultural Resources Stream

Students selecting this stream complete 18 credits from:

AGEC 430	(3)	Agriculture, Food and Resource Policy
AGEC 442	(3)	Economics of International Agricultural Development
ANTH 206	(3)	Environment and Culture
ANTH 301	(3)	Nomadic Pastoralists
ANTH 339	(3)	Ecological Anthropology
ANTH 418	(3)	Environment and Development
ANTH 512	(3)	Political Ecology
ECON 326	(3)	Ecological Economics
GEOG 302	(3)	Environmental Management 1
GEOG 403	(3)	Global Health and Environmental Change
GEOG 408	(3)	Geography of Development
GEOG 410	(3)	Geography of Underdevelopment: Current Problems
GEOG 508	(3)	Resources, People and Power
GEOG 510	(3)	Humid Tropical Environments
MGCR 360	(3)	Social Context of Business
MIME 524	(3)	Mineral Resources Economics
NRSC 340	(3)	Global Perspectives on Food
NRSC 540	(3)	Socio-Cultural Issues in Water
NUTR 501	(3)	Nutrition in Developing Countries
URBP 506	(3)	Environmental Policy and Planning
URBP 520	(3)	Globalization: Planning and Change

6.2.7.16 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 to 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 post-graduate programs or professional schools.

Academic Adviser: Professor Brian Driscoll

Macdonald-Stewart Building 3-035

Telephone: 514-398-7887

Complementary Courses (24 credits)

24 credits of complementary courses are selected from the categories listed below:

12 credits - Fundamentals

12 credits - Applications

Complementary Courses - Fundamentals

12 credits selected from:

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 330	(3)	Fundamentals of Nutrition
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 433	(3)	Animal Nutrition
ENTO 330	(3)	Insect Biology
ENTO 440	(3)	Insect Diversity
ENVB 305	(3)	Population & Community Ecology Phylogen

En

Telephone: 514-398-7864

Required Courses (12 credits)

PLNT 353	(3)	Plant Structure and Function
PLNT 358	(3)	Flowering Plant Diversity
PLNT 426	(3)	Plant Ecophysiology
PLNT 460	(3)	Plant Ecology

Complementary Courses (12 credits)

12 credits of complementary courses selected from:

BINF 511	(3)	Bioinformatics for Genomics
CELL 500	(3)	Techniques Plant Molecular Genetics
CELL 501	(3)	Plant Molecular Biology and Genetics
ENVB 313	(3)	Phylogeny and Biogeography
NUTR 512	(3)	Herbs, Foods and Phytochemicals
PLNT 203	(3)	Economic Botany
PLNT 310	(3)	Plant Propagation
PLNT 315	(3)	Herbs and Medicinal Plants
PLNT 424	(3)	Cellular Regulation
PLNT 435	(3)	Plant Breeding
PLNT 489	(1)	Project Planning and Proposal
PLNT 490	(2)	Research Project

6.2.7.20 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 post-graduate studies. When taken in conjunction with the Major Agro-Environmental Sciences and the specialization in Professional Agriculture, this specialization conforms with the eligibility requirements for the Ordre des agronomes du Québec.

Specialization Adviser: Professor Jaswinder Singh

Raymond Building 2-021a

Telephone: 514-3987906

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:

PLNT 203	(3)	Economic Botany
PLNT 302	(3)	Forage Crops and Pastures

PLNT 307	(3)	Vegetable Production
PLNT 312	(3)	Urban Horticulture
PLNT 315	(3)	Herbs and Medicinal Plants
PLNT 321	(3)	Fruit Production
PLNT 322	(3)	Greenhouse Management
PLNT 331	(3)	Grains and Biofuel Crops
PLNT 489	(1)	Project Planning and Proposal
PLNT 490	(2)	Research Project

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

This specialization is recommended for students with a strong interest in the complex field of plant protection in both urban and agricultural settings. The biology of herbivores, of pathogenic organisms, and of plant competitive interactions and defense mechanisms as well as the interactions of plants with their environment will be studied. Students interested in the theory and application of techniques of integrated plant protection should choose this specialization in conjunction with the Major Agro-Environmental Sciences or the Major Environmental Biology. Those interested in the biotechnology and molecular aspects of plant-pathogen or plant-insect interactions should choose it in conjunction with the Major Life Sciences (Biological and Agricultural). Complementary specializations could include Plant Biology, Plant Production, Entomology or Microbiology.

Specialization Adviser: Professor Ajjamada Kushalappa

Raymond Building, Room 2-028b

Telephone: 514-398-7867

Required Courses (18 credits)

ENTO 330	(3)	Insect Biology
ENTO 352	(3)	Control of Insect Pests
PLNT 304	(3)	Biology of Fungi
PLNT 305	(3)	Plant Pathology
PLNT 353	(3)	Plant Structure and Function
PLNT 434	(3)	Weed Biology and Control

Complementary Courses (6 credits)

6 credits of complementary courses selected from:

ENTO 340	(3)	Field Entomology
ENTO 515	(3)	Parasitoid Behavioural Ecology
PLNT 426	(3)	Plant Ecophysiology
PLNT 430	(3)	Plant Disease Epidemiology
PLNT 520	(3)	Plant-Microbe Interactions

6.2.7.22 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 Agro-Environmental Sciences Major and a second specialization in Agricultural Economics, Animal Production, Ecological Agriculture, Plant Production, or Soil and Water, or with the Agricultural Economics Major and the Agri-business Specialization.

Note: Most students will require 21 credits to complete this specialization. In consultation with the academic adviser students taking the Agricultural Economics Specialization and the Agri-business Specialization will need to take an additional 3 credits, chosen in consultation with the academic adviser, such that they meet the minimum requirements of the OAQ. None of the credits within this specialization may also count for the student's major or other specialization. All of the 21 or 24 credits count only for this specialization.

Specialization Adviser: Professor Joann Whalen

Macdonald-Stewart Building 2-069

Telephone: 514-398-7943

Required Courses (12 credits)

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

Complementary Courses

9-12 credits

For students in the Agro-Environmental Sciences major with a specialization in Agricultural Economics, Animal Production, Ecological Agriculture, Plant Production or Soil and Water Resources:

3 credits from:

AGEC 332	(3)	Farm Management and Finance
ANSC 433	(3)	Animal Nutrition
SOIL 445	(3)	Agroenvironmental Fertilizer Use

Plus 6-9 additional credits, approved by the academic adviser, in agricultural sciences or applied agriculture to meet the requirements of the OAQ.

Note: students in the Agricultural Economics specialization must take 12 complementary credits while students in Animal Production, Ecological Agriculture, Plant Production, or Soil and Water Resources specializations must take 9 complementary credits.

For students in the Agricultural Economics major with a specialization in Agri-Business:

6 credits from:

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

3 credits from:

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

3 credits from:

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

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

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

Specialization Adviser: Professor Joann Whalen

Macdonald-Stewart Building 2-069

Telephone: 514-398-7943

Required Courses (15 credits)

*Note: SOIL 335 and SOIL 445 are offered in alternate years.

BREE 217	(3)	Hydrology and Water Resources
SOIL 315	(3)	Soil Fertility and Fertilizer Use
SOIL 326	(3)	Soils in a Changing Environment
SOIL 335*	(3)	Soil Ecology and Management
SOIL 445*	(3)	Agroenvironmental Fertilizer Use

Complementary Courses (9 credits)

9 credits of complementary courses selected as follows:

3 credits fcet5F0gcj/F1 8.1 T20.722 .561 Tm(Sogy and)Tj1 0 05 1 1T20.722 .561 Tm(W)Tj1 0 05 1 08T20.722 .561 Tm(aQuaertiland Management)Tj1 0 0 1 165.20.7

BIOL 427	(3)	Herpetology
WILD 350	(3)	Mammalogy
WILD 420	(3)	Ornithology

At least 5 credits from the following:

ENVB 315	(3)	Science of Inland Waters
NRSC 514	(3)	Freshwater Ecosystems
WILD 311	(3)	Ethology
WILD 415	(2)	Conservation Law
WILD 424	(3)	Parasitology
WILD 475	(3)	Desert Ecology

6.3 Bachelor of Engineering (Bioresource) - B.Eng.(Bioresource)

6.3.1 Bioresource Engineering Major

The Department of Bioresource Engineering collaborates with other departments and the Faculty of Engineering in providing courses of instruction for a curriculum in Bioresource Engineering. Graduates qualify to apply for registration as professional engineers in any province of Canada. The professional agrology option qualifies graduates to apply for registration to the *Ordre des agronomes du Québec*.

There are six streams offered within the Bioresource Engineering Major. Via the appropriate choice of elective course sets, a particular area of study may be emphasized. More information about these streams and the suggested course sets for each can be found on the Department website at www.mcgill.ca/bioeng.

In the **Bio-Environmental Engineering** stream, students learn about soil and water quality management and conservation, geomatics, hydrology and water resources, organic waste treatment, use of GIS for biosystem operation, engineering for land development, climate control in buildings, ecosystem remediation, and many other related topics.

Students who follow the **Soil and Water** stream learn about hydrology, irrigation and drainage, soil and water management, environmental quality control and remediation, structural design, machinery design, artificial intelligence, GIS, and remote sensing.

In the **Ecological Engineering** stream, students learn how to apply principals of engineering and ecology to the design and implementation of complex ecological systems. They learn how to create systems that preserve and enhance natural ecological processes as a means of fulfilling design requirements.

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.

The **Professional Agrology** option offers a course selection guided to qualify graduates for registration as professional agrologists with the *Ordre des agronomes du Québec*.

All required and complementary courses must be passed with a minimum grade of C. One term is spent taking courses from the Faculty of Engineering on the McGill downtown campus.

Students also have the opportunity to pursue a Minor. Several possibilities are: Agricultural Production, Environment, Ecological Agriculture, Biotechnology, Computer Science, Construction Engineering and Management, Entrepreneurship, and Environmental Engineering. Details of some of these Minors can be found under *Faculty of Engineering > Minor Programs*. To complete a Minor, it is necessary to spend at least one extra term beyond the normal requirements of the B.Eng.(Bioresource) program.

See [section 4.5.1: Minimum Credit Requirement](#) for prerequisites and minimum credit requirements.

6.3.2 About the B.Eng. (Bioresource) Program

Bioresource Engineering is the unique branch of engineering that includes Biological engineering and Bioengineering where professional engineering practice intersects with biological sciences. Bioresource Engineers design, improve and manage biological-based systems to operate in efficient and sustainable ways for the well being of the environment and society.

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

Academic Adviser-U1: Professor Grant Clark

Macdonald-Stewart Building, Room 1-099

Telephone: 514-398-7784

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 481	(.5)	Undergraduate Seminar 1
BREE 482	(.5)	Undergraduate Seminar 2
BREE 483	(.5)	Undergraduate Seminar 3
BREE 484	(.5)	Undergraduate Seminar 4
BREE 485	(1)	Undergraduate Seminar 5
BREE 486	(1)	Undergraduate Seminar 6
BREE 490	(3)	Engineering Design 2
BREE 495	(3)	Engineering Design 3
FACC 400	(1)	Engineering Professional Practice
MECH 289	(3)	Design Graphics
MIME 310	(3)	Engineering Economy

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	(4)	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

BREE 506	(3)	Advances in Drainage Management
BREE 509	(3)	Hydrologic Systems and Modelling
BREE 510	(3)	Watershed Systems Engineering
BREE 512	(3)	Soil Cutting and Tillage
BREE 515	(3)	Soil Chemical Engineering
BREE 516	(3)	Soil Structural Engineering
BREE 517	(3)	Soil Hydrologic Modelling
BREE 518	(3)	Soil Mechanical Engineering
BREE 519	(3)	Soil Physical Modelling
BREE 520	(3)	Soil Chemical Modelling
BREE 521	(3)	Soil Structural Modelling
BREE 522	(3)	Soil Hydrologic Modelling
BREE 523	(3)	Soil Mechanical Modelling
BREE 524	(3)	Soil Physical Modelling
BREE 525	(3)	Soil Chemical Modelling
BREE 526	(3)	Soil Structural Modelling
BREE 527	(3)	Soil Hydrologic Modelling
BREE 528	(3)	Soil Mechanical Modelling
BREE 529	(3)	Soil Physical Modelling
BREE 530	(3)	Soil Chemical Modelling
BREE 531	(3)	Soil Structural Modelling
BREE 532	(3)	Soil Hydrologic Modelling
BREE 533	(3)	Soil Mechanical Modelling
BREE 534	(3)	Soil Physical Modelling
BREE 535	(3)	Soil Chemical Modelling
BREE 536	(3)	Soil Structural Modelling
BREE 537	(3)	Soil Hydrologic Modelling
BREE 538	(3)	Soil Mechanical Modelling
BREE 539	(3)	Soil Physical Modelling
BREE 540	(3)	Soil Chemical Modelling
BREE 541	(3)	Soil Structural Modelling
BREE 542	(3)	Soil Hydrologic Modelling
BREE 543	(3)	Soil Mechanical Modelling
BREE 544	(3)	Soil Physical Modelling
BREE 545	(3)	Soil Chemical Modelling
BREE 546	(3)	Soil Structural Modelling
BREE 547	(3)	Soil Hydrologic Modelling
BREE 548	(3)	Soil Mechanical Modelling
BREE 549	(3)	Soil Physical Modelling
BREE 550	(3)	Soil Chemical Modelling
BREE 551	(3)	Soil Structural Modelling
BREE 552	(3)	Soil Hydrologic Modelling
BREE 553	(3)	Soil Mechanical Modelling
BREE 554	(3)	Soil Physical Modelling
BREE 555	(3)	Soil Chemical Modelling
BREE 556	(3)	Soil Structural Modelling
BREE 557	(3)	Soil Hydrologic Modelling
BREE 558	(3)	Soil Mechanical Modelling
BREE 559	(3)	Soil Physical Modelling
BREE 560	(3)	Soil Chemical Modelling
BREE 561	(3)	Soil Structural Modelling
BREE 562	(3)	Soil Hydrologic Modelling
BREE 563	(3)	Soil Mechanical Modelling
BREE 564	(3)	Soil Physical Modelling
BREE 565	(3)	Soil Chemical Modelling
BREE 566	(3)	Soil Structural Modelling
BREE 567	(3)	Soil Hydrologic Modelling
BREE 568	(3)	Soil Mechanical Modelling
BREE 569	(3)	Soil Physical Modelling
BREE 570	(3)	Soil Chemical Modelling
BREE 571	(3)	Soil Structural Modelling
BREE 572	(3)	Soil Hydrologic Modelling
BREE 573	(3)	Soil Mechanical Modelling
BREE 574	(3)	Soil Physical Modelling
BREE 575	(3)	Soil Chemical Modelling
BREE 576	(3)	Soil Structural Modelling
BREE 577	(3)	Soil Hydrologic Modelling
BREE 578	(3)	Soil Mechanical Modelling
BREE 579	(3)	Soil Physical Modelling
BREE 580	(3)	Soil Chemical Modelling
BREE 581	(3)	Soil Structural Modelling
BREE 582	(3)	Soil Hydrologic Modelling
BREE 583	(3)	Soil Mechanical Modelling
BREE 584	(3)	Soil Physical Modelling
BREE 585	(3)	Soil Chemical Modelling
BREE 586	(3)	Soil Structural Modelling
BREE 587	(3)	Soil Hydrologic Modelling
BREE 588	(3)	Soil Mechanical Modelling
BREE 589	(3)	Soil Physical Modelling
BREE 590	(3)	Soil Chemical Modelling
BREE 591	(3)	Soil Structural Modelling
BREE 592	(3)	Soil Hydrologic Modelling
BREE 593	(3)	Soil Mechanical Modelling
BREE 594	(3)	Soil Physical Modelling
BREE 595	(3)	Soil Chemical Modelling
BREE 596	(3)	Soil Structural Modelling
BREE 597	(3)	Soil Hydrologic Modelling
BREE 598	(3)	Soil Mechanical Modelling
BREE 599	(3)	Soil Physical Modelling
BREE 600	(3)	Soil Chemical Modelling

BREE 486	(1)	Undergraduate Seminar 6
BREE 490	(3)	Engineering Design 2
BREE 495	(3)	Engineering Design 3
FACC 400	(1)	Engineering Professional Practice
MECH 289	(3)	Design Graphics
MIME 310	(3)	Engineering Economy

Complementary Courses

57 credits of the complementary courses selected as follow:

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

AEMA 310	(3)	Statistical Methods 1
MECH 346	(3)	Heat Transfer

Set B - Natural Sciences

6 credits from each of the following two groups:

Group 1 - Biology

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

Group 2 - Agricultural Sciences

AEBI 210	(3)	Organisms 1
ANSC 250	(3)	Principles of Animal Science
ANSC 433	(3)	Animal Nutrition
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)	Vegetable Production
PLNT 312	(3)	Urban Horticulture
PLNT 321	(3)	Fruit Production
PLNT 322	(3)	Greenhouse Management
PLNT 331	(3)	Grains and Biofuel Crops

BREE 412	(3)	Machinery Systems Engineering
BREE 419	(3)	Structural Design
BREE 423	(3)	Biological Material Properties
BREE 497	(3)	Environmental Design 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

6.3.5 Bachelor of Engineering (Bioresource) - B.Eng.(Bioresource) Related Programs

6.3.5.1 Minor in Environmental Engineering

For more information, see *Minor in Environmental Engineering (27 credits)*.

6.3.5.2 Barbados Field Study Semester

For more information, see *Field Studies and Study Abroad > Field Studies > Barbados Field Study Semester*.

6.3.5.3 Barbados Interdisciplinary Tropical Studies Field Semester

For more information, see *Field Studies and Study Abroad > Field Studies > Barbados Interdisciplinary Tropical Studies Field Semester*.

6.3.5.4 Internship Opportunities and Co-op Experiences

For more information, see *Internship Opportunities and Co-op Experiences*.

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

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

Freshman Adviser

Dr. Alice Cherestes
 Macdonald-Stewart Building, Room1-023
 Telephone: 514-398-7980

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

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

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

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

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

Academic Adviser-U1: Professor Salwa Karboune IFSci45427m Cru 0 1 417.740 12163.122 Tm(T)Tj1 0 0 1 740 12163.122 Tm(telephone: 5148666-7980)Tj/31 8.1 Tf1

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

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 425	(3)	Principles of Quality Assurance
FDSC 442	(3)	Food Microbiology
FDSC 497	(1.5)	Professional Seminar: Food
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
NUTR 301	(3)	Psychology
NUTR 322	(2)	Applied Sciences Communication

Applied Human Resources

6.5.4 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 three and one-half 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.

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

Academic Advising Coordinator: Sandy Phillips, M.Sc., R.D.

School of Dietetics and Human Nutrition

Notes:

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

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

Advising Note for Professional Practice

*Note: Successful completion of each rotation of each level of Stage (Professional Practice) is required to pass that level of Stage. Each level is a prerequisite for the next level and must be passed with a minimum grade of C. Undergraduate registration is restricted to students in the Dietetics Major, CGPA greater than or equal to 3.0. Visiting and Special students must contact the Academic Advising Coordinator (dietetics) regarding course registration approval.

Students are reminded that ethical conduct on Professional Practice (Stage) rotations is required. The Faculty reserves the right to require the withdrawal of any student if at any time the Faculty feels the student has displayed unprofessional conduct or demonstrates incompetence.

Required Courses (100 credits)

Required courses and Professional Practice (Stage) courses are sequenced in a specific order over 9 terms (3.5 year program). See <http://www.mcgill.ca/dietetics> for detailed information regarding the undergraduate program plan.

AEMA 310	(3)	Statistical Methods 1
AGEC 242	(3)	Management Theories and Practices
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	(3)	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	(2)	Applied Sciences Communication
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1
NUTR 345	(3)	Food Service Systems Management

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

This Major covers the many aspects of human nutrition and food and gives first, an education in the scientific fundamentals of these disciplines and second, an opportunity to focus in (a) nutritional biochemistry and metabolism, (b) global nutrition issues, (c) food function, product development and safety and/or (d) sports nutrition. Graduates are qualified for careers in pharmaceutical and/or food industries or government laboratories, the health science communications field, sports clinics and national or international food support programs. Graduates often continue on to further studies preparing for careers in research, medicine, and dentistry or as specialists in nutrition. Aside from working as university teachers and researchers, postgraduates may be employed by government and health protection agencies, in world development programs or in the food sector. (Currently under revision)

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

Required Courses (54 credits)

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

Term 1

Note: The course FDSC 212 has been retired and the program requirements are under review.

FDSC 212	(0)	
LSCI 211	(3)	Biochemistry 1
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals

Term 2

ANSC 234	(3)	Biochemistry 2
FDSC 251	(3)	Food Chemistry 1
LSCI 230	(3)	Introductory Microbiology
NUTR 322	(2)	Applied Sciences Communication

Term 3

AEMA 310	(3)	Statistical Methods 1
ANSC 323	(3)	Mammalian Physiology
FDSC 305	(3)	Food Chemistry 2

Term 4

ANSC 424	(3)	Metabolic Endocrinology
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1

Term 5

NUTR 420	(3)	Toxicology and Health Risks
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)

AEMA 310	(3)	Statistical Methods 1
ANSC 323	(3)	Mammalian Physiology
FDSC 305	(3)	Food Chemistry 2

Term 4

ANSC 424	(3)	Metabolic Endocrinology
NUTR 337	(3)	Nutrition Through Life
NUTR 344	(4)	Clinical Nutrition 1

Term 5

Required Courses (54 credits)

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

Term 1

Note: The course FDSC 212 has been retired and the program requirements are under review.

FDSC 212	(0)	
LSCI 211	(3)	Biochemistry 1
NUTR 207	(3)	Nutrition and Health
NUTR 214	(4)	Food Fundamentals

Term 2

ANSC 234	(3)	Biochemistry 2
	(3)FFF	Food Chemistry 1

12 credits are selected as follows:

ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
LSCI 204	(3)	Genetics
PARA 438	(3)	Immunology

Electives (21 credits)

21 credits of Electives are taken to meet the minimum credit requirement for the de

Term 5

NUTR 420	(3)	Toxicology and Health Risks
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 from the list below

12 credits from the Sports Nutrition set

3 credits, one of the following courses:

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

Sports Nutrition

12 credits selected as follows:

Note: Students select either ANAT 214 or EDKP 205.

ANAT 214	(3)	Systemic Human Anatomy
EDKP 205	(3)	Structural Anatomy
EDKP 391	(3)	Physiology in Sport and Exercise
EDKP 495	(3)	Scientific Principles of Training
NUTR 503	(3)	Bioenergetics and the Lifespan

Electives (21 credits)

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

6.5.9 Bachelor of Science (Nutritional Sciences) - Related Programs

6.5.9.1 Minor in Human Nutrition

Detailed information on this minor can be found under [section 6.6.7: Minor Human Nutrition \(24 credits\)](#) in this publication.

6.5.9.2 Concurrent Bachelor of Science in Food Science - B.Sc.(F.Sc.) and Bachelor of Science in Nutritional Sciences - B.Sc.(Nutr.Sc.) - Food Science/Nutritional Science Major

Detailed information on this concurrent program can be found under [section 6.4.3: 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 \(122 credits\)](#) in this publication.

6.6 Minor Programs

The Faculty of Agricultural and Environmental Sciences offers a number of minor programs.

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

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

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

Notes:

1. Most courses listed at the 300 level and higher have prerequisites. Although instructors may waive prerequisite(s) in some cases, students are urged to prepare their program of study well before their final year.
2. Not all courses are offered every year. For information on available courses, consult Class Schedule at <http://www.mcgill.ca/minerva>; complete listings can be found in the Courses section of this Calendar.

Academic Adviser: Professor Jaswinder Singh

Department of Plant Science

Telephone: 514-398-7906

General Regulations

To obtain a Minor in Agricultural Production, students must:

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

Required Courses (12 credits)

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

Complementary Courses (12 credits)

12 credits chosen from the following list in consultation with the academic adviser for the minor:

AGRI 215	(3)	Agro-Ecosystems Field Course
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)	Vegetable Production
PLNT 321	(3)	Fruit Production
PLNT 331	(3)	Grains and Biofuel Crops

6.6.2 Minor Animal Biology (24 credits)

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

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

Academic Adviser: Professor Roger Cue

Department of Animal Science

Telephone: 514-398-7805

Required Courses (15 credits)

ANSC 312	(3)	Animal Health and Disease
ANSC 323	(3)	Mammalian Physiology
ANSC 324	(3)	Developmental Biology and Reproduction
ANSC 420	(3)	Animal Biotechnology
PARA 438	(3)	Immunology

Complementary Courses (9 credits)

A minimum of 9 credits selected from the following list:

AEBI 451	(3)	Research Project 1
ANSC 251	(3)	Comparative Anatomy
ANSC 326	(3)	Fundamentals of Population Genetics
ANSC 330	(3)	Fundamentals of Nutrition
ANSC 400	(3)	Eukaryotic Cells and Viruses
ANSC 424	(3)	Metabolic Endocrinology
ANSC 433	(3)	Animal Nutrition
ANSC 560	(3)	Biology of Lactation
ANSC 565	(3)	Applied Information Systems

6.6.3 Minor Animal Health and Disease (24 credits)

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

This minor is not open to students in B.Sc.(Ag.Env.Sc.) programs. These students may register for the specialization 872 307.183 Tm5hcfprograms.

NUTR 420	(3)	Toxicology and Health Risks
PHAR 300	(3)	Drug Action
WILD 424	(3)	Parasitology

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

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

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

Students are advised, during the U1 year, to consult their Major Program adviser and the academic adviser of the Minor. At the time of registration for the U2 year, students must declare their intent to obtain the Minor. With the agreement of their Major Program adviser they must submit their program of courses already taken, and to be taken, to the academic adviser of the Minor. The academic adviser of the Minor will then certify which courses the student will apply toward the Minor and confirm that the student's program conforms with its requirements.

Academic Adviser: Dr. Caroline Begg

Macdonald-Stewart Building, Room 2-071

Telephone: 514-398-8749

General Regulations

To obtain a Minor in Ecological Agriculture, students must:

- Ensure that their academic record at the University includes a C grade or higher in the courses as specified in the course requirements given below.
- 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)

AGRI 210	(3)	Agro-Ecological History
AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 340	(3)	Principles of Ecological Agriculture

Complementary Courses (15 credits)

15 credits chosen from:

*Note: Offered in alternate years.

AGEC 333	(3)	Resource Economics
AGRI 310	(3)	Internship in Agriculture/Environment
AGRI 435	(3)	Soil and Water Quality Management
ENTO 352	(3)	Control of Insect Pests
ENTO 446	(3)	Apiculture
MICR 331	(3)	Microbial Ecology
NUTR 512	(3)	Herbs, Foods and Phytochemicals
PLNT 302	(3)	Forage Crops and Pastures
PLNT 312*	(3)	Urban Horticulture
PLNT 315*	(3)	Herbs and Medicinal Plants
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

6.6.5 Minor in Entrepreneurship



Note: Students will no longer be admitted into the Minor in Entrepreneurship as it is being suspended. For additional information on the Minor in Entrepreneurship, consult the *2007-2008 Undergraduate Programs Calendar* available at www.mcgill.ca/students/courses/calendars.

6.6.6 Minor in Environmental Engineering (27 credits)

The Minor program consists of 27 credits in courses that are environment related. By means of a judicious choice of complementary and elective courses, Bioresource Engineering students may obtain this Minor with a minimum of 12 additional credits.

The Environmental Engineering Minor is administered by the Faculty of Engineering, Department of Civil Engineering and Applied Mechanics (see *Faculty of Engineering > Environmental Engineering Minor*).

3 credits in physiology, one of:

ANSC 323	(3)	Mammalian Physiology
PHGY 202	(3)	Human Physiology: Body Functions
PHGY 210	(3)	Mammalian Physiology 2

3 credits in nutrition, one of:

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

9 credits are selected as follows:

ANSC 551	(3)	Carbohydrate and Lipid Metabolism
ANSC 552	(3)	Protein Metabolism and Nutrition
NUTR 403	(3)	Nutrition in Society
NUTR 420	(3)	Toxicology and Health Risks
NUTR 436	(2)	Nutritional Assessment
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 512	(3)	Herbs, Foods and Phytochemicals
NUTR 551	(3)	Analysis of Nutrition Data
PATH 300	(3)	Human Disease

One of:

MIMM 314	(3)	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

6.7 Post-Baccalaureate Certificate Programs

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

6.7.1 Certificate in Ecological Agriculture (30 credits)

This 30-credit certificate program is very similar to the minor program and is designed to focus on the principles underlying the practice of ecological agriculture. The Certificate may be of special interest to professional agrologists who wish 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

Macdonald-Stewart Building, Room 2-071

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

Required Courses (9 credits)

AGRI 210	(3)	Agro-Ecological History
AGRI 340	(3)	Principles of Ecological Agriculture
ENVB 305	(3)	Population & Community Ecology

Complementary Courses (21 credits)

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

3 - 6 credits (at least 3 credits) from the following:

SOIL 335	(3)	Soil Ecology and Management
SOIL 445	(3)	Agroenvironmental Fertilizer Use

15-18 credits to be chosen from:

AGEC 333	(3)	Resource Economics
AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 310	(3)	Internship in Agriculture/Environment
AGRI 435	(3)	Soil and Water Quality Management
ENTO 352	(3)	Control of Insect Pests
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 312	(3)	Urban Horticulture
PLNT 434	(3)	Weed Biology and Control
PLNT 460	(3)	Plant Ecology
WILD 311	(3)	Ethology

6.7.2 Certificate in Entrepreneurship

The Certificate in Entrepreneurship is no longer being offered. For Information on this program, refer to the *2006-2007 Undergraduate Programs Calendar*.

6.7.3 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-Stewart Building, Room 1-038

Telephone: 514-398-7919

Required Course (3 credits)

FDSC 200	(3)	Introduction to Food Science
----------	-----	------------------------------

Complementary Courses (27 credits)

27 credits are selected as follows:

9 credits from the following:

FDSC 251	(3)	Food Chemistry 1
FDSC 300	(3)	Principles of Food Analysis 1
FDSC 305	(3)	Food Chemistry 2
FDSC 315	(3)	Separation Techniques in Food Analysis 1
FDSC 319	(3)	Food Commodities
FDSC 334	(3)	Analysis of Food Toxins and Toxicants
FDSC 410	(3)	Flavour Chemistry
FDSC 495D1	(1.5)	Food Science Seminar
FDSC 495D2	(1.5)	Food Science Seminar

6 credits from the following:

BREE 324	(3)	Elements of Food Engineering
FDSC 310	(3)	Post Harvest Fruit and Vegetable Technology
FDSC 330	(3)	Food Processing
FDSC 400	(3)	Food Packaging
FDSC 405	(3)	Product Development
FDSC 425	(3)	Principles of Quality Assurance

3 credits from the following:

FDSC 442	(3)	Food Microbiology
LSCI 230	(3)	Introductory Microbiology
NUTR 207	(3)	Nutrition and Health

9 credits from the following:

AGRI 510	(3)	Professional Practice
FDSC 515	(3)	Enzyme Thermodynamics/Kinetics
FDSC 519	(3)	Advanced Food Processing
FDSC 520	(3)	Biophysical Chemistry of Food
FDSC 530	(3)	Advanced Analytical Chemistry
FDSC 535	(3)	Food Biotechnology
FDSC 536	(3)	Food Traceability
FDSC 537	(3)	Nutraceutical Chemistry

6.8 Field Studies

6.8.1 African Field Study Semester

The Department of Geography, Faculty of Science, coordinates the 15-credit interdisciplinary African Field Study Semester, see *Field Studies and Study Abroad > African Field Study Semester*.

6.8.2 Barbados Field Study Semester

This program takes place at Bellairs Research Institute in Barbados, it is a full 15-credit program offered each Fall semester. For more information, see *Field Studies and Study Abroad > Barbados Field Study Semester*.

6.8.3 Barbados Interdisciplinary Tropical Studies Field Semester

This 15-credit program is offered at the Bellairs Research Institute in Barbados. For more information, see *Field Studies and Study Abroad > Barbados Interdisciplinary Tropical Studies Field Semester*.

6.8.4 Panama Field Study Semester

The program is a joint venture between McGill University and the Smithsonian Tropical Research Institute (STRI) in Panama. For more information, see *Field Studies and Study Abroad > Panama FFFFFFFF*

8.2 Farm Management and Technology Program Faculty

Director

Peter Enright

Associate Director

Serge Lussier

8.3 Diploma Farm Management Technology

This 3-year academic and practical program is offered on the Macdonald Campus and taught by the staff of the Faculty of Agricultural and Environmental Sciences of McGill University. The program is funded by the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec and authorized by the Ministère de l'Éducation, du Loisir et du Sport du Québec.

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 dev

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)
 FMTP 038 (2) Financial and Managerial Accounting (152-038-MC)
 FMTP 039 (1.67) Agri-Marketing (152-039-MC)
 FMTP 042 (2.33) Budgeting, Finance and Policies (152-042-MC)
 FMTP 043 (2.67) Entrepreneurship 2 (152-043-MC)
 FMTP 044 (1.33) Management of Human Resources (152-044-MC)

Animal Science

FMTP 005 (1.33) Animal Anatomy and Physiology
 FMTP 008 (2.33) Introduction to Animal Science (152-008-MC)

English

FMTP 077 ()
 FMTP 080 (2) English Upgrading
 FMTP 082 (2.33) Literary Genres (603-102-04)
 FMTP 083 (2.33) Literary Themes (603-103-04)
 FMTP 084 (2) English for FMT (603-VSA-04)

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 ()
 FMTP 094 (1) Physical Activity (109-104-02)
 FMTP 095 (1) Active Living (109-105-02)

Plant Science

FMTTP 006	(2.67)	Agricultural Botany
FMTTP 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

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

Plant Science Category

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

Complementary Courses*

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

* After consultation with their academic adviser, students can substitute complementary courses taken at another collegial institution. This includes science courses which are required for further studies in a degree program. The cost associated with courses taken elsewhere must be assumed by the students.

FMTTP 096	(2)	Forests, Forestry and Society (305-032-MC)
FMTTP 097	(2)	Landscape Design (504-VSG-MC)

Comprehensive Assessment

The objective of this examination is to ensure that students have attained the objectives and standards for each competency in the program. Successful completion of the Comprehensive Assessment is mandatory to obtain the D.E.C.

The passing grade is 60%. The mark indicating that the student has successfully completed the Comprehensive Assessment will appear on the student's transcript.

English Exit Examination

All students who wish to graduate and obtain the D.E.C. must pass the English Exit Examination that is offered by the M.E.L.S. Students must take this examination on the date selected by the M.E.L.S.

8.4 Entrance Requirements – FMT

1. Students should have a good practical knowledge of farming under eastern Canadian conditions. One year of experience is recommended but under special conditions a four-month summer season is acceptable.
2. The minimum academic entrance requirements are a Quebec High School Leaving Certificate (Secondary V), or its equivalent and any other academic requirement set by the M.E.L.S.
3. All candidates for admission must make arrangements to come to the Macdonald Campus for an interview prior to admission to the program.
4. Admission to this program is only in the Fall semester.

5.

8.7 Fees and Expenses – FMT

8.7.1 Fees

Tuition fees for all full-time students who are eligible for the Farm Management and Technology Program are paid by the

Each of these specializations must be taken within the context of a major, depending on the orientation of a student towards animal production management, animal biotechnology, further studies in animal health, international studies and/or Graduate Studies.

Students interested in becoming a professional agronomist (a member of the *Ordre des agronomes du Québec*), should register in the Agro-Environmental Sciences Major and take the specialization in Animal Production.

9.3 Department of Animal Science Faculty

Chair

Kevin M. Wade

Emeritus Professors

Roger B. Buckland

Eduardo R. Chavez

Bruce R. Downey

Urs Kuhnlein

John E. Moxley

Sherman Touchburn

Professors

Flannan Hayes

Xin Zhao (*James McGill Professor*)

Associate Professors

Vilceu Bordignon

Roger I. Cue

Humberto G. Monardes

Arif Mustafa (*William Dawson Scholar*)

Leroy E. Phillip

Kevin Wade

David Zadworny

Assistant Professors

Martin Chénier

Raj Duggavathi

Sarah Kimmins

Adjunct Professors

Hernan Baldassarre

Pierre Lacasse

Daniel Lefebvre

Bruce Murphy

10 Department of Bioresource Engineering

10.1 Location

Macdonald Stewart Building – Room MS1-027
McGill University, Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec H9X 3V9
Canada

Telephone: 514-398-7773
Fax: 514-398-8387
Email: shiv.prasher@mcgill.ca
Website: www.mcgill.ca/bioeng

10.2 About the Department of Bioresource Engineering

Bioresource Engineering is an interdisciplinary program that integrates engineering, design and the biological sciences. It is a unique profession that applies engineering principles to the enhancement and sustainability of the world's natural resources. Bioresource engineers seek solutions to problems that involve plants, animals and the environment. Bioresource Engineering includes the design, construction, operation, maintenance, remediation and upgrading of systems that contain biological components. This also includes the design of many of the technological constructions that are part of such systems. Thus, Bioresource Engineering includes quite a few sub-disciplines, which are linked because of their biological orientation.

10.3 Department of Bioresource Engineering Faculty

Chair

Shiv O. Prasher

Emeritus Professors

Robert S. Broughton
Robert Kok

Professors

Suzelle Barrington
Chandra Madramootoo (*James McGill Professor*)
Edward McKyes
Shiv O. Prasher (*James McGill Professor*)
G.S. Vijaya Raghavan (*James McGill Professor*)

Associate Professor

Michael O. Ngadi (*William Dawson Scholar*)

Assistant Professors

Jan Adamowski
Grant Clark

Assistant Professors

Mark Lefsrud

Valérie Orsat

Adjunct Professors

Joyce Boye

Young Choi

Murray Clamen

Aleksandra Drizo

Samuel Gameda

Serge Guiot

Pierre Jutras

Jose Martinez

Philippe Savoie

Boris Tartakovsky

Clément Vigneault

Ning Wang

Faculty Lecturers

Alice Cherestes

Marcia Knutt

11 Department of Food Science and Agricultural Chemistry

11.1 Location

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

Telephone: 514-398-7898

Fax: 514-398-7977

Email: foodscience@mcgill.ca

Website: www.mcgill.ca/foodscience

11.2 About the Department of Food Science

Food Science is a multidisciplinary field involving chemistry, biochemistry, nutrition, microbiology and processing to give one the scientific knowledge to solve real problems associated with the many facets of the food system. Food Science is still a relatively new and growing discipline, brought about mainly as a response to the social changes taking place in North America and other parts of the developed world. The current trend towards merger between **food** and **pharmaceutical industries** to produce the next generation of new food products such as functional foods and nutraceuticals is the biggest challenge facing the discipline of Food Science today. You can be part of it. The programs offered are: **B.Sc. Food Science (Food Chemistry or Food Science option)** and **Concurrent degree which includes B.Sc. Food Science/B.Sc. Nutritional Sciences**. For more information on these programs, see [section 6.4f...](#)

Associate Members

Colin A. Chapman (*Anthropology*)

Lauren J. Chapman (*Biology*)

David Green (*Redpath Museum*)

William D. Marshall (*Dept. of Food Science and Agricultural Chemistry*)

Donald L. Smith (*Dept. of Plant Science*)

Marilyn Scott (*Institute of Parasitology*)

Adjunct Professors

Denis Angers

Suzanne Beauchemin

Dominique Berteaux

Guy Boivin

Michel Bouchard

Kimberly Fernie

Charles W. Greer

Daniel Houle

Carlos Miguez

Jean-Pierre Savard

Elwin G. Smith

Geoffrey Sunahara

Charles Vincent

Frederick G. Whoriskey

Faculty Lecturers

Serge Lussier

David Wees

Associate MembersGregory Brown (*Department of Biology*)Timothy A. Johns (*School of Dietetics and Human Nutrition*)**Adjunct Professors**

Marc Fortin

Sylvie Jenni

Shahrokh Khanizadeh

Jean-François Laliberté

14 School of Dietetics and Human Nutrition

14.1 Location

Macdonald Stewart Building – Room MS2-039
McGill University, Macdonald Campus
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec H9X 3V9
Canada

Telephone: 514-398-7840

Fax: 514-398-7739

Email: nutrition.dietetics@mcgill.caWebsite: www.mcgill.ca/dietetics

14.2 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.

14.3 School of Dietetics and Human Nutrition Faculty

Director

Kristine G. Koski

Professor Emerita

Harriet V. Kuhnlein

Jacobs Starkey, Linda; B.Sc.(H.Ec.)(Mt. St. Vin.), M.Sc., Ph.D.(McG.), RD, FDC; Faculty Lecturer, School of Dietetics and Human Nutrition

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

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

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

Kermasha, Selim; B.Sc.(Baghdad), D.Sc.(Nancy); Associate Professor of Food Science and Agricultural Chemistry and Chair of Department

Kimmins, Sarah; B.Sc.(Dal.), M.Sc.(Nova Scotia Ag.), Ph.D.(Dal.); Assistant Professor of Animal Science

Knutt, Marcia E.; H.B.Sc.(W. Ont.), M.A., Ph.D.(Brandeis); Faculty Lecturer, Department of Bioresource Engineering

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

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

Kushalappa,

Singh, Jaswinder; B.Sc., M.Sc.(Punjab Agricultural University), Ph.D.(Syd.); Assistant Professor of Plant Science

Smith, Donald L.; B.Sc., M.Sc.(Acad.), Ph.D.(Guelph); Professor of Plant Science (*James McGill Professor*)

Strachan, Ian; B.Sc.(Tor.), M.Sc., Ph.D.(Qu.); Associate Professor of Agrometeorology

Stromvik, Martina V.; B.A., M.S.(Stockholm), Ph.D.(Ill-Chic.); Associate Professor of Plant Science

Thériault, Pascal; B.Sc.(Agr.), M.Sc.(KSU); Faculty Lecturer, Farm Management and Technology Program

Thibault, Louise; B.Sc., M.Sc., Ph.D.(Laval); Associate Professor of Dietetics and Human Nutrition

Thomassin, Paul; B.Sc.(Agr.)(McG.), M.S., Ph.D.(Hawaii Pac.); Associate Professor of Agricultural Economics

Titman, Rodger D.; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(New Br.), Fellow A.O.U.; Associate Professor (Post-retirement) of Wildlife Biology

van de Voort, Frederik R.; B.Sc., M.Sc., Ph.D.(Br. Col.); Professor of Food Science and Agricultural Chemistry

Wade, Kevin; B.Agr.Sc., M.Agr.Sc.(Dublin), Ph.D.(C'nell); Associate Professor of Animal Science and Chair, Department of Animal Science

Waterway, Marcia J.; B.A.(Calvin), M.S.(Wis.), Ph.D.(C'nell); Associate Professor of Plant Science and Curator, McGill University Herbarium

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

Wees, David D.; B.Sc.(Agr.), M.Sc.(McG.); Faculty Lecturer, Department of Plant Science

Weiler, Hope; B.A.Sc.(Guelph), Ph.D.(McM.); Associate Professor of Human Nutrition (*Canada Research Chair*)

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

Wheeler, Terry; B.Sc.(Nfld.), M.Sc., Ph.D.(Guelph); Associate Professor of Entomology and Director, Lyman Entomological Museum and Research Laboratory

Whyte, Lyle G; B.Sc.(Regina), Ph.D.(Wat.); Associate Professor of Microbiology (*Canada Research Chair*)

Wykes, Linda; B.Sc., M.Sc., Ph.D.(Tor.); Associate Professor of Dietetics and Human Nutrition (*William Dawson Scholar*)

Yaylayan, Varoujan A.; B.Sc., M.Sc.(Beirut), Ph.D.(Alta.); Associate Professor of Food Science and Agricultural Chemistry

Zadworny, David; B.Sc., Ph.D.(Guelph); Associate Professor of Animal Science

Zhao, Xin; B.Sc., M.Sc.(Nanjing IT), Ph.D.(C'nell); Professor of Animal Science (*James McGill Professor*)