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## 1 The Faculty

### 1.1 Location

McGill University, Macdonald Campus  
 21,111 Lakeshore Road  
 Sainte-Anne-de-Bellevue, QC H9X 3V9  
 Canada

Telephone: (514) 398-7928  
 Website: [www.mcgill.ca/macdonald](http://www.mcgill.ca/macdonald)

The Faculty of Agricultural and Environmental Sciences, and the School of Dietetics and Human Nutrition, are located on the Macdonald Campus of McGill in Sainte-Anne-de-Bellevue at the western end of Montreal Island.

Served by public transport (MUCTC bus and train), it is easily reached from the McGill Downtown Campus and from Dorval International Airport. A McGill intercampus shuttle bus service is also available.

### 1.2 Administrative Officers

Deborah J.I. Buszard; B.Sc.(Bath), Ph.D.(Lond.) **Dean,  
 Faculty of Agricultural and Environmental Sciences,  
 and Associate Vice-Principal (Macdonald Campus)**

William H. Hendershot; B.Sc.(Tor.), M.Sc.(McG.),  
 Ph.D.(U.B.C.) **Associate Dean (Academic)**

Eric R. Norris; B.S.A.(Tor.), M.Sc.(Guelph), Ph.D.(Mich. St.)  
**Associate Dean (Student Affairs)**

Marcel J. Couture; B.Sc.(Agr.)(McG.), M.Sc.(Guelph)  
**Associate Dean (Community Relations)**

Diane E. Mather; B.Sc.(Agr.)(McG.), M.Sc., Ph.D.(Guelph)  
**Associate Dean (Research)**

Gary O'Connell; B.Comm.(C'dia) **Director,  
 Administrative Services**

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

Philip Lavoie; Dip.Agr., B.Sc.(Agr.)(McG.) **Manager,  
 Macdonald Campus Farm**

Ginette Legault **Manager, Campus Housing**

Suzanne Higgins; B.A.(McG.) **Manager,  
 Admissions and Student Affairs**

Peter D.L. Knox; B.Sc.(Agr.)(McG.) **Supervisor,  
 Property Maintenance**

### 1.3 Programs and Academic Units

The Faculty of Agricultural and Environmental Sciences and the School of Dietetics and Human Nutrition offer B.Sc., M.Sc. and Ph.D. programs in the areas of study of: Agricultural and Biosystems Engineering, Agricultural Sciences, Biological Sciences, Environmental Sciences, Food Science, and Nutritional Sciences. Also offered are a Diploma in Environment, and Certificates in Ecological Agriculture and in Entrepreneurship.

The Faculty is comprised of eight academic units: the School of Dietetics and Human Nutrition; the departments of Agricultural and Biosystems Engineering, Agricultural Economics, Animal Science, Food Science and Agricultural Chemistry, Natural Resource Sciences, and Plant Science; and the Institute of Parasitology.

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

The School of Dietetics and Human Nutrition offers programs in dietetics and nutrition, the former leading to membership in various professional associations. Professional Practice experiences to complete the dietetics practicum are provided in the McGill teaching hospitals and in a wide

variety of health, education, business, government and community agencies.

The Institute of Parasitology offers graduate programs leading to M.Sc. and Ph.D. degrees as well as a Graduate Certificate in Biotechnology. Major areas of research include the molecular biology, immunology, and population biology of parasites and their hosts and the biochemical pharmacology of antiparasite drugs. The underlying orientation of all research is to apply relevant modern biological techniques to reduce parasite transmission and to improve methods of diagnosis and control. The research background and activities of the staff encompass many disciplines applied to the study of host-parasite interactions, ranging from research involving viruses and cancer cells to studies on protozoa and helminth parasites of humans, livestock, and other animals. The Institute has been designated by the Quebec Government as a Centre d'excellence for research on parasites.

### 1.3.1 Co-op Experience

Most undergraduate programs offered in the Faculty include the opportunity for a Co-op work experience.

Students are able to profit from a Co-op experience of approximately 12 weeks duration where they will be exposed to the main areas of operation of their employer. Each student registered in a Co-op work experience will benefit from a program developed by both the employer and the instructor exclusively for that individual student.

Students who register for a Co-op experience benefit from practical learning arising from work-term employment in a meaningful job situation. Students also benefit from the non-tangible learning experience arising from the increased responsibilities required to obtain and successfully complete the work term.

## 1.4 Macdonald Campus Facilities

The Morgan Arboretum has over 245 hectares of managed and natural woodlands and tree plantations used for environmental research and teaching in a wide range of courses. Groups of all the Canadian native trees and many useful and important exotics are also present. The Arboretum features three self-guided interpretation trails, 20 kilometres of wooded trails, a variety of forest ecosystems, soil and water conservation projects, forest operations such as plantation management, timber harvesting and maple syrup production, and related forestry-wildlife ecological activities. A nature interpretation program is offered.

### Macdonald Campus Library

The collection includes a wide variety of resources in agricultural, food and animal sciences; as well as nutrition, the environment and sustainable development. The Library is a depository for many print and electronic government publications. The online catalogue (MUSE) includes the holdings of all McGill Libraries. Remote and wireless access to the catalogue, circulation, reference, electronic resources, and interlibrary loan service is available. An extensive collection of electronic information is accessible from the McGill Libraries homepage at [www.library.mcgill.ca](http://www.library.mcgill.ca) which provides access to an excellent range of full-text journals and documents via databases and licensed publisher Websites. Reference service is available to assist users in obtaining necessary print or electronic resources, and a comprehensive library instruction service is provided throughout the year. Further information is available on the Web at [www.mcgill.ca/macdonald-library](http://www.mcgill.ca/macdonald-library).

### 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 only in size to the National Collection. The Museum also has an active graduate research program in association with the Department of Natural Resource Sciences. Study facilities are available, on request from the Curator, to all bona fide students of entomology. Visits by other interested parties can also be arranged by calling (514) 398-7914.

### Brace Centre for Water Resources Management

The Brace Centre for Water Resources Management is located on the Macdonald Campus. It is a multidisciplinary and advanced research and training centre of McGill University, dedicated to solving problems of water management related to food production, the environment, and rural development. It brings together staff from several McGill faculties to undertake research, teaching, specialized training, and policy and strategic studies, both in Canada and internationally. The Centre draws on the wide range of facilities available within the University.

## 2 Summary of Academic Programs

### 2.1 Outline of Academic Programs

Programs leading to five degrees are offered on the Macdonald Campus, with Majors associated with each degree. In addition, Certificates are offered in Ecological Agriculture and in Entrepreneurship.

**Note:** To reflect the increase in non-agricultural programs offered by the Faculty, the degree designation Bachelor of Science in Agriculture, B.Sc.(Agr.) was changed this year to Bachelor of Science in Agricultural and Environmental Sciences, B.Sc.(Agr.Env.Sc.).

#### 2.1.1 Major Programs

##### Bachelor of Science in Agricultural and Environmental Sciences - B.Sc.(Agr.Env.Sc.)

This is a three-year (90 credit) program [or three and one-half years (102 credits) for Agricultural Science Internship Options] following the Diploma of Collegial Studies and leading to professional qualification in Agricultural Science or in one of its related specialized branches in Biological Science, Environmental Science or Renewable Resources.

Graduates of programs marked with an asterisk \* are eligible for membership in l'Ordre des agronomes du Québec.

\***Agricultural Economics Major, see page 308**

Agribusiness Option  
Agricultural Systems Option  
Natural Resource Economics Option

\***Agricultural Sciences Majors, see page 315**

Ecological Agriculture Option  
Ecological Agriculture Internship Option  
International Agriculture Option  
International Agriculture Internship Option  
General Option  
General Internship Option  
Soil Science Option  
Soil Science Internship Option

**Animal Biology Major, see page 310**

\***Animal Science Major, see page 310**

**Applied Zoology Major, see page 317**

**Botanical Science Major, see page 320**

Ecology Option  
Molecular Option

**Environmental Biology Major, see page 318**

**Environment Major, under McGill School of Environment**

Biodiversity and Conservation Domain, see page 333  
Ecological Determinants of Health Domain, see page 334  
Environmetrics Domain, see page 336  
Food Production and Environment Domain, see page 337  
Land Surface Processes and Environmental Change Domain, see page 338  
Renewable Resource Management Domain, see page 339  
Water Environments and Ecosystems Domain, see page 340

**Microbiology Major, see page 318**

\***Plant Science Major, see page 320**

**Resource Conservation Major, see page 318**

**Wildlife Biology Major, see page 319**

### **Bachelor of Science in Agricultural Engineering - B.Sc.(Agr.Eng.)**

This is normally a three and one-half year (109 credit) program following the Diploma of Collegial Studies in Sciences and leading to professional qualification in both Agricultural Engineering and Agrology.

[Agricultural Engineering Major, see page 306](#)

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

This is a three-year (90 credit) program following the Diploma of Collegial Studies leading to professional qualification in Food Science.

[Food Science Major, see page 313](#)

### **Bachelor of Science in Nutritional Sciences - B.Sc.(Nutr.Sc.)**

Two programs are offered by the School of Dietetics and Human Nutrition, a three-year (90 credit) program for Nutrition and a three and one-half year (115 credit) program for Dietetics, following the Diploma of Collegial Studies.

[Dietetics Major, see page 311](#)

[Nutrition Major, see page 312](#)

Nutritional Biochemistry Option  
Nutrition and Populations Option  
Nutrition of Food Option

#### **2.1.2 Minor Programs**

[Minor in Agricultural Economics, see page 309.](#)

[Minor in Agricultural Engineering, see page 307.](#)

[Minor in Agricultural Production, see page 321.](#)

[Minor in Ecological Agriculture, see page 314.](#)

[Minor in Entrepreneurship, see page 309.](#)

[Minor in Environment, see page 329,](#) under McGill School of Environment.

[Environmental Engineering Minor, see page 307.](#)

[Minor in Human Nutrition, see page 313.](#)

#### **2.1.3 Certificate Programs**

[Certificate in Ecological Agriculture, see page 314.](#)

[Certificate in Entrepreneurship, see page 310.](#)

#### **2.1.4 Diploma Programs**

[Farm Management and Technology Program, see page 321.](#)

[Diploma in Environment, see page 343,](#) under McGill School of Environment.

## **2.2 Environmental Sciences Programs**

### **McGill School of Environment (MSE)**

The MSE is a joint initiative of the Faculty of Agricultural and Environmental Sciences, the Faculty of Arts, and the Faculty of Science. It offers a B.Sc.(Ag.Env.Sc.) Major in Environment, B.Sc. Major in Environment, a B.A. Faculty Program in Environment, a Minor in Environment and a Diploma in Environment. Many of the MSE programs allow students to choose to study exclusively on the Macdonald or downtown campuses, or to take advantage of both.

A list of the B.Sc.(Ag.Env.Sc.) Domains is given under [section 2.1.1 "Major Programs"](#). Further information on all programs is given under the McGill School of Environment.

### **Other Environmental Programs at Macdonald Campus**

A number of other integrated environmental science programs are also offered on the Macdonald Campus. The objective of these interdepartmental programs is to provide the student with a well-rounded training in a specific interdisciplinary subject as well as the basis for managing the natural resource. The programs include:

[Agricultural Economics Major, Natural Resource Economics Option, see page 309](#)

[Applied Zoology Major, see page 317](#)

[Botanical Science Major, see page 320](#)

[Environmental Biology Major, see page 318](#)

[Microbiology Major, see page 318](#)

[Resource Conservation Major, see page 318](#)

[Wildlife Biology Major, see page 319](#)

## **3 Application and Admission Requirements**

The programs in the Faculty of Agricultural and Environmental Sciences, and the School of Dietetics and Human Nutrition, are normally of three years' duration following the completion of a two-year Quebec post-secondary Collegial program (CEGEP).

Holders of the Diplôme d'études collégiales (DEC)/Diploma of Collegial Studies (DCS) are considered for admission to the first year of a program requiring the completion of a minimum of 90 credits – 102 credits for Agricultural Science Major Internship Options, 109 credits for Agricultural Engineering, and 115 credits for Dietetics. Students who complete the "DEC en sciences, lettres et arts" may be considered for any university program. Students who have completed a technical or professional DEC will be considered on an individual basis.

Based upon entry with the appropriate DEC, the B.Sc.(Agr. Env.Sc.) and the B.Sc.(F.Sc.) are both three-year programs. The B.Sc.(Agr.Eng.) is normally a three and one-half year program. Two B.Sc.(Nutr.Sc.) programs are offered, a three-year program for Nutrition, and a three and one-half year program for Dietetics.

Students from outside Quebec who are admitted on the basis of a high school diploma enter a program which is extended by one year to include the 30 credits of the Freshman Year ([see section 5.1 "Freshman Major"](#)). Advanced standing of up to 30 credits may be granted to students who obtain satisfactory results in International Baccalaureate, French Baccalaureate, Advanced Placement Tests, or Advanced Level Examinations.

**Applications can be submitted on-line at [www.mcgill.ca/applying](http://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 information, or to obtain a printed application package for students unable to apply via the Web, contact:

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

Telephone: (514) 398-7928

E-mail: [studentinfo@macdonald.mcgill.ca](mailto:studentinfo@macdonald.mcgill.ca)

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

More specific information on application deadlines and admission requirements can be found on the Web or under "[Admission Requirements](#)" on page 13.

## **4 Student Information**

### **4.1 Student Services**

Students who study on Macdonald Campus may make full use of all McGill [Student Services, see page 39](#). The Office of the Dean of Students, in cooperation with the Faculty of Agricultural and Environmental Sciences, offers students direct access to several services, see [Student Services – Macdonald Campus on page 40](#).

Further information can be found via the Faculty Website [www.mcgill.ca/macdonald/resources/student-services](http://www.mcgill.ca/macdonald/resources/student-services) and the Student Services Website [www.mcgill.ca/stuserv](http://www.mcgill.ca/stuserv).

### **4.2 Macdonald Campus Residences**

For more than 90 years, residence life has been an integral part of Macdonald Campus activities. Students may apply for residence in either of two distinctive facilities:

Laird Hall, with a capacity of more than 210 students, is arranged on a co-educational basis and provides single and double room accommodation for both undergraduate and graduate students.

The EcoResidence, Canada's first ecologically-friendly student residence and recent winner of the prix d'excellence from l'Ordre des architectes du Québec, accommodates 100 students in apartment-style living.

For further information, please refer to "University Residences – Macdonald Campus" on page 42 or the Faculty Website, [www.mcgill.ca/macdonald/resources](http://www.mcgill.ca/macdonald/resources), or e-mail: [residences@macdonald.mcgill.ca](mailto:residences@macdonald.mcgill.ca).

### 4.3 Extracurricular Activities

All undergraduate, postgraduate, and Farm Management and Technology students are members of the Macdonald Campus Students' Society. The MCSS, through the 19-member Students' Council, is involved in numerous campus activities such as social events, academic affairs, and the coordination of clubs and organizations. Student life is informal and friendly and student groups range from the Outdoor Adventure Club to the Photography Society. Major social events include Orientation, the Halloween Party, Winter Carnival and International Night. The Ceilidh, a student-run bar located in the Centennial Centre, is open every Thursday night.

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

### 4.4 Student Conduct and Discipline

The Associate Vice-Principal (Macdonald Campus) and Dean of the Faculty of Agricultural and Environmental Sciences has jurisdiction over all offenses committed by students registered at Macdonald and over all offenses committed by students on or about the Macdonald Campus. Directors of residences have jurisdiction over all offenses committed in or about their respective residences.

Students found guilty of improper conduct, violation of rules or willful damage to persons or property, shall be liable to discipline as set forth in the Code of Student Conduct and Disciplinary Procedures as printed in the *Handbook of Student Rights and Responsibilities*. A copy of the Handbook can be found on the Web at [www.mcgill.ca/secretariat/statutes](http://www.mcgill.ca/secretariat/statutes) or obtained from the Student Affairs Office or the Macdonald Campus Student Services Office. The Code specifies that discipline may include: imposition of fines or assessments for damage caused by individuals or groups; posting of security for good behaviour; reprimand; imposition of conduct probation; suspension or expulsion from classes or residence; expulsion from the University.

### 4.5 Fees

The University reserves the right to make changes without notice in its published scale of tuition, residence and other fees.

All certified cheques, money orders, etc., should be drawn to the order of McGill University, and made payable in Canadian funds. Payment of student fees can also be made through any Chartered Bank in Canada.

**The University shall have no obligation to issue any transcript of record, award any diploma or re-register a student in case of non-payment of tuition fees, library fines, residence fees, or loans on their due date.**

### Tuition Fees

General information on Tuition and other fees will be found under "Fees" on page 29.

### Other Expenses

In addition to tuition fees and the cost of accommodation and meals, students should be prepared to spend a minimum of \$1000 (dependent on program) on prescribed textbooks and classroom supplies. These may be purchased at the campus book store in Centennial Centre.

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

### 4.6 Immunization for Dietetics Majors

Students in the Dietetics Major are required to complete the Compulsory Immunization Program for Health Care students prior to registration. Participation in Professional Practices (Stages) in Dietetics will only be permitted for those students who have completed all immunization requirements.

### 4.7 Language Requirement for Professions

Quebec law requires that candidates seeking admission to provincially-recognized Quebec professional corporations or orders possess a working knowledge of the French language, i.e. be able to communicate verbally and in writing in that language. Agriologists, Chemists, Dietitians, and Engineers are among those within this group.

For additional information, see "Language Requirements for Professions" on page 39.

## 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 Calendar.** While departmental and faculty advisers and staff are always available to give advice and guidance, the ultimate responsibility for completeness and correctness of course selection and registration, for compliance with, and completion of program and degree requirements, and for the observance of regulations and deadlines *rests with the student*. It is the student's responsibility to seek guidance if in any doubt; misunderstanding or misapprehension will not be accepted as cause for dispensation from any regulation, deadline, program or degree requirement.

### 5.1 Freshman Major

Students entering university for the first time from schools other than the Quebec CEGEP level will be required to complete the 30 credits listed below before selecting a subject Major.

	<b>CREDITS</b>
<b>Required Courses - Fall</b>	<b>14.5</b>
AEBI 120 General Biology	3.0
AEMA 101 Calculus 1	3.0
AEPH 112 Introductory Physics 1	4.0
AGRI 195* Freshman Seminar 1	0.5
FDSC 230 Organic Chemistry	4.0
<b>Required Courses - Winter</b>	<b>12.5</b>
AEMA 102 Calculus 2	4.0
AEPH 114 Introductory Physics 2	4.0
AGRI 196* Freshman Seminar 2	0.5
FDSC 110 Inorganic Chemistry	4.0
<b>Elective - Winter</b>	<b>3.0</b>
Elective	3.0
AEBI 202 Cellular Biology must be substituted for students in programs in the B.Sc.(Nutr.Sc.) degree.	
ABEN 103 Linear Algebra must be substituted for students in the B.Sc.(Agr.Eng.) degree.	
<b>Total Credits</b>	<b>30.0</b>

\* AGRI 195 and AGRI 196 are required for all freshmen excluding Dietetics and Nutrition students.



## 5.2 Academic Advisers

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

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

## 5.3 Minimum Credit Requirement

Each student's minimum credit requirement for the degree is determined at the time of acceptance and is specified in the letter of admission or its attached documentation.

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 – 102 credits for Agricultural Science Major Internship Options, 109 credits for Agricultural Engineering, and 115 credits for Dietetics.

Students from outside Quebec who are admitted on the basis of a high school diploma enter a program that is extended by one year to include the 30 credits of **Freshman Major**, see [section 5.1](#). Advanced standing of up to 30 credits may be granted to students who obtain satisfactory results in International Baccalaureate, French Baccalaureate, Advanced Placement Tests or Advanced Level Examinations under certain conditions; refer to [section 3 "Application and Admission Requirements"](#).

## 5.4 Categories of Students

### Full-Time Students

Full-time students in satisfactory standing take a minimum of 12 credits per term.

Full-time students in probationary standing are not normally permitted to take more than 14 credits per term. In exceptional circumstances the Committee on Academic Standing may give permission to attempt more.

### Part-time students

Part-time students carry fewer than 12 credits per term. New students apply through the Student Affairs Office of the Faculty and the applicant must have the qualifications to enter a full-time program.

## 5.5 Academic Standing

All students are required to give satisfactory evidence of mastery of the material of lectures and laboratories. Examinations are normally held at the end of each course but other methods of evaluation may also be used. The grade assigned for a course represents the standing of the student in all the work of the course.

## 5.6 Examinations

Students should refer to ["Examinations" on page 35](#) for information about final examinations and deferred examinations.

Every student has a right to write essays, examinations and theses in English or in French except in courses where knowledge of a language is one of the objects of the course.

Oral presentations made as part of course requirements shall be in English.

### 5.6.1 Reassessments and Rereads

In accordance with the Charter of Student Rights, and subject to the conditions stated therein, students have the right to consult any written submission for which they have received a mark as well as the right to discuss this submission with the examiner.

If, after discussion with the instructor, students request a formal final examination re-read, they must apply in writing to the Associate Dean (Student Affairs). The following conditions apply:

- grades may be either raised or lowered as the result of a reread;

- rereads in courses outside the Faculty of Agricultural and Environmental Sciences are subject to the deadlines, rules and regulations of the relevant faculty.

Application for rereads must be made by March 31 for Fall Term courses and by September 30 for Winter Term and Summer Term courses. Students are assessed a fee for formal rereads. Any request to have term work re-evaluated must be made directly to the instructor concerned. Students should consult the Student Affairs Office for further information.

### 5.6.2 Deferred Examinations

The Faculty offers deferred exams for the Fall and Winter period. Verify date in Calendar of Dates and consult the Student Affairs Office for procedures.

## 5.7 Credit System

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

Please refer to ["Credit System" on page 33](#).

## 5.8 Academic Credit Transfer

Transfer of credits (maximum of 30) based on courses taken at other institutions before entrance to this Faculty is made by the Admissions Committee prior to entrance.

Transfer of credits may be made for work at other educational institutions during a student's attendance at McGill University. Permission to apply such credits to a McGill program must be secured by the student from the Academic Adviser of their program before the work is undertaken. Forms are available in the Student Affairs Office of the Faculty. Grades obtained in such courses do not enter into calculations of grade point averages (GPA) in this Faculty.

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

Full-time students may, with the written approval of the Student Affairs Office, register for 3 credits, or exceptionally 6 credits, in each term at any university in the province of Quebec. These courses successfully completed with a minimum grade of C (according to the standards of the university giving the course), will be recognized for the purpose of the degree but the grades obtained will not enter into calculations of GPA in this Faculty. For further details, see ["Quebec Inter-University Transfer Agreement \(IUT\)" on page 38](#).

## 5.9 Academic Standing

- When a student's CGPA (or TGPA in the first term of the program) falls below 2.00, the student's academic standing becomes Probationary and withdrawal is advised but not required.
- Students in Probationary standing may register for no more than 14 credits per term.
- While in Probationary standing students must achieve a TGPA of 2.50 to continue in Probationary standing or a CGPA of 2.00 in order to return to Satisfactory standing. Failure to meet at least one of these conditions will result in Unsatisfactory standing (In the case of Fall Term, this will be Interim Unsatisfactory standing and the rules for Probationary standing will apply)
- Students in Unsatisfactory standing are required to withdraw. Application for readmission may be made only after registration has been interrupted for at least one term (not including Summer term).
- Readmission will be in the standing Unsatisfactory Readmit and an CGPA of 2.00 must be achieved to return to Satisfactory standing or a TGPA of 2.50 must be achieved for Probationary standing.

tionary standing. Failure to meet at least one of these conditions will result in requirement for permanent withdrawal.

### 5.10 Course Change Information

1. Courses: please refer to "Course Change Period" on page 28 and the Calendar of Dates.
2. Course withdrawal (Transcript notation of "W"): please refer to "Regulations Concerning Withdrawal" on page 28 and the Calendar of Dates.
3. Other changes: Information about changes may be obtained from the Student Affairs Office of the Faculty. Application for changes must be made to the Committee on Academic Standing.

### 5.11 Graduate Courses Available to Undergraduates

Undergraduates wishing to take such courses must have a cumulative grade point average (CGPA) of at least 3.20.

### 5.12 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 or Director of the School concerned.

Students may be admonished by a professor or instructor for dishonest or improper conduct or may be reported to the Dean or Director concerned for disciplinary action.

Punctual attendance at all classes, laboratory periods, tests, etc., is expected of all students. Absences are excused only on grounds of necessity or illness, of which proof may be required. Special attention is called to the fact that the completion of all laboratory work is obligatory and the opportunity to make up work missed will be provided only in the case of properly excused absences.

The Faculty has the power to refuse examination to those students who persist in absenting themselves from classes without permission.

Students are requested not to make application for additional leave either before or after holiday periods, as such leaves are granted only in case of illness or other exceptional circumstances.

### 5.13 Degree Requirements

To be eligible for a B.Sc.(Agr.Env.Sc.), B.Sc.(Agr.Eng.), B.Sc.(F.Sc.), or B.Sc.(Nutr.Sc.) degree, students must have passed, or achieved exemption in, all required and complementary courses of the program. They must have a CGPA of at least 2.00.

They must have completed the minimum credit requirement for the degree as specified in their letter of admission or its attached documentation, see section 5.3 "Minimum Credit Requirement". At least 60 of these credits must have been taken at McGill.

In addition, students in the Dietetics program must have completed the stages of professional formation.

Students majoring in Agricultural Engineering are also required to have at least 650 hours experience in some phase of agricultural engineering work approved by the Agricultural and Biosystems Engineering Department.

### 5.14 Distinction or Great Distinction

Students in Major programs whose academic performance is appropriate may be awarded their degrees with *Distinction* or *Great Distinction* under the following conditions:

- students must have completed a minimum of 60 McGill credits to be eligible;
- for *Distinction*, the CGPA at graduation must be 3.30 to 3.49;
- for *Great Distinction*, the CGPA at graduation must be 3.50 or greater.

### 5.15 Dean's Honour List

The designation *Dean's Honour List* may be awarded to graduating students under the following conditions:

- students must have completed a minimum of 60 McGill credits to be considered;
- students must be in the top 10% of the Faculty's graduating students.

### 5.16 Medals and Prizes

Various medals, scholarships and prizes are open to graduating students. No application is required. Full details of these are set out in the *Undergraduate Scholarships and Awards Calendar*, available in the Student Affairs Office, Laird Hall, Room 106 or on the Web at [www.mcgill.ca](http://www.mcgill.ca).

## 6 Academic Programs

### 6.1 Department of Agricultural and Biosystems Engineering

Macdonald Stewart Building – Room MS1-027

Telephone: (514) 398-7773

Fax: (514) 398-8387

E-mail: [Raghavan@macdonald.mcgill.ca](mailto:Raghavan@macdonald.mcgill.ca)

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

*Chair* — G.S. Vijaya Raghavan

*Emeritus Professor* — Robert S. Broughton

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

*Associate Professors* — Robert B. Bonnell (*Brace Centre for Water Resources Management*), Eric R. Norris, John D.J. Sheppard

*Assistant Professor* — Michael O. Ngadi, Ning Wang

*Adjunct Professors* — Darakhshan Ahmad, Geoffrey I. Sunahara, Clement Vigneault

### AGRICULTURAL ENGINEERING MAJOR

The Department of Agricultural and Biosystems Engineering collaborates with other departments and the Faculty of Engineering, in providing courses of instruction for a curriculum in Agricultural and Biosystems Engineering. Graduates qualify for registration as professional engineers in any province of Canada.

The curriculum integrates engineering fundamentals and branch specialties with the agricultural, biological and environmental sciences. The program is oriented to the design, construction and management of the agro-ecosystem; various facets of any, or several of these areas may be emphasized by the student via the appropriate choice of elective course sets. Academic advisers can aid the student to structure her or his studies along any of the following main streams: Agro-Environmental; Irrigation and Drainage; Agricultural Machinery and Buildings; Food and Bio-Processing; and Information and Computing Technologies. For all streams, a typical engineering approach is followed; the relationship is stressed between decision-making/option-evaluation during the design stage and the resultant performance of the unit once implemented. This approach is applicable to practically any case, be it a simple cultivation tool, a harvesting machine, a post-harvest conditioning process or an entire ecosystem.

In order to learn some of the fundamentals of engineering design, and appreciate and understand other branches of engineering, students are required to spend the second term of the penultimate year taking courses in the Faculty of Engineering. Furthermore, students in Agricultural Engineering may wish to increase their competence in specialized fields by pursuing one of the Minors offered by the Faculty of Engineering. **Minors** which

would be of particular interest include: **Biotechnology, Computer Science, Construction Engineering and Management, and Environmental Engineering**. Details of these Minors can be found in the Faculty of Engineering “**Minor Programs and Choice of Electives or Complementary Courses**” on page 185. In order to complete a Minor, students will need to spend at least one extra term beyond the requirements of the B.Sc.(Agr.Eng.) program.

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

**Required Courses:** 85 credits.

**Complementary Courses:** 24 credits.

		<b>CREDITS</b>
		<b>85</b>
<b>Required Courses:</b>		
ABEN 210	Mechanics 1	4
ABEN 211	Mechanics 2	4
ABEN 214	Surveying	3
ABEN 216	Materials Science	3
ABEN 217	Hydrology and Drainage	3
ABEN 252	Structured Computer Programming	3
ABEN 305	Fluid Mechanics	4
ABEN 312	Circuit Analysis	3
ABEN 314	Agricultural Structures	3
ABEN 315	Design of Machines	4
ABEN 319	Applied Mathematics	3
ABEN 325	Food Engineering 1	3
ABEN 341	Strength of Materials	4
ABEN 412	Agricultural Machinery	3
ABEN 418	Soil Mechanics and Foundations	3
ABEN 490	Design 1	2
ABEN 491D1	Undergraduate Seminar 1	.5
ABEN 491D2	Undergraduate Seminar 1	.5
ABEN 492D1	Undergraduate Seminar 2	.5
ABEN 492D2	Undergraduate Seminar 2	.5
ABEN 495	Design 2	3
AEMA 202	Calculus	3
AEMA 205	Differential Equations	4
AEMA 310	Statistical Methods 1	3
ANSC 250	Principles of Animal Science	3
MECH 346	Heat Transfer	3
MECH 362	Mechanical Laboratory 1	2
MIME 221	Engineering Professional Practice	1
MIME 310	Engineering Economy	3
PLNT 211	Principles of Plant Science	3
SOIL 210	Principles of Soil Science	3
<b>Complementary Courses:</b>		<b>24</b>
One 3-credit course on the impact of technology on society from the following list:		3
CHEE 230	(3) Environmental Aspects of Technology	
ENVR 203	(3) Knowledge, Ethics and Environment	
EPSC 243	(3) Environmental Geology	
GEOG 302	(3) Environmental Management 1	
MIME 308	(3) Social Impact of Technology	
Two 3-credit courses in the humanities and social sciences/administrative studies and law/language courses. (Any language course which is deemed by the academic adviser to have a sufficient cultural component or, in the case of the student who is not proficient in a specific language, program credit will be given for the second of two successfully completed, academically approved 3-credit language courses.)		6
15 additional credits selected in consultation with Academic Adviser		15
6 credits, two of the following courses:		
ABEN 212	(3) Graphics	
or MECH 291	(3) Graphics	
ABEN 301	(3) Biothermodynamics	
or MECH 240	(3) Thermodynamics 1	

Advanced Agricultural and Biosystems Engineering – 9 or more credits (with the permission of the instructor, graduate level courses may be taken) from:

ABEN 322	(3) Food Production/Processing Waste Management
ABEN 323	(3) Physical Properties of Biological Materials
ABEN 330	(3) GIS for Biosystems Management
ABEN 411	(3) Off-Road Power Machinery
ABEN 416	(3) Engineering for Land Development
ABEN 419	(3) Structural Design
ABEN 500	(3) Advanced Applications: Computing in Agriculture
ABEN 504	(3) Instrumentation and Control
ABEN 506	(3) Advances in Drainage Management
ABEN 509	(3) Hydrologic Systems and Modelling
ABEN 512	(3) Soil Cutting and Tillage
ABEN 514	(3) Drain Pipe and Envelope Materials
ABEN 515	(3) Computer Models in Drainage Engineering
ABEN 516	(3) Preparation and Appraisal of Drainage Projects
ABEN 517	(3) Drainage Project Contracts
ABEN 518	(3) Pollution Control for Agriculture
ABEN 525	(3) Ventilation of Agricultural Structures
ABEN 530	(3) Fermentation Engineering
ABEN 605	(3) Functional Analysis of Agricultural Machines
ABEN 607	(3) Engineering Aspects of Plant Environment
ABEN 612	(3) Simulation and Modelling
ABEN 616	(3) Advanced Soil and Water Engineering
AGRI 435	(3) Soil and Water Quality Management

#### ENVIRONMENTAL ENGINEERING MINOR

The Minor program consists of 27 credits in courses environment related. By a judicious choice of complementary and elective courses, Agricultural and Biosystems Engineering students may obtain this Minor with a minimum of 12 additional credits. The **Environmental Engineering Minor**, see page 188, is administered by the Faculty of Engineering, Department of Civil Engineering and Applied Mechanics.

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

ABEN 322	Food Production/Processing Waste Management
ABEN 416	Engineering for Land Development
ABEN 518	Pollution Control for Agriculture
MICR 331	Microbial Ecology
WILD 333	Physical and Biological Aspects of Pollution

#### MINOR IN AGRICULTURAL ENGINEERING

Academic Adviser: Professor R.B. Bonnell

Engineering systems are now being emphasized in animal and crop production, management and utilization of waste products, production of value-added materials and by-products, protection of natural resources, conservation and management of ecosystems, soil and water decontamination, and the development of new food, fibre and pharmaceutical products. Computer-based systems play a major role in the management of information, and process control in many of the above technologies.

A non-professional Minor in Agricultural Engineering, consisting of 24 credits of Agricultural and Biosystems Engineering courses is available for students registered in the B.Sc.(Agr.Env.Sc.) and B.Sc.(F.Sc.) programs. A total of 18 credits of required Agricultural and Biosystems Engineering courses will demonstrate basic engineering applications. Selection of 6 complementary credits from a wide range of Agricultural and Biosystems Engineering courses will allow more focused study in one of the 6 streams of Agricultural Engineering, viz. Agro-Environmental; Irrigation and Drainage; Agricultural Machinery and Buildings; Food and Bio-Processing; and Information and Computing Technologies.

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 in Agricultural Engineering. 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 Engineering Minor. The Academic Adviser of the Agricultural Engineering 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.

**General Regulations**

To obtain a Minor in Agricultural Engineering, 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:** 18 credits.  
**Complementary Courses:** 6 credits.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>18</b>
ABEN 252 Structured Computer Programming	3
ABEN 314 Agricultural Structures	3
ABEN 324 Elements of Food Engineering	3
ABEN 412 Agricultural Machinery	3

**Complementary Courses:** **6**  
 6 credits chosen from the following list in consultation with the Academic Adviser for the Minor:

ABEN 411 (3) Off-Road Power Machinery	
ABEN 413 (3) Materials Handling Systems	
ABEN 416 (3) Engineering for Land Development	
ABEN 418 (3) Soil Mechanics and Foundations	
ABEN 500 (3) Advanced Applications: Computing in Agriculture	
ABEN 512 (3) Soil Cutting and Tillage	
ABEN 514 (3) Drain Pipe and Envelope Materials	
ABEN 515 (3) Computer Models in Drainage Engineering	
ABEN 516 (3) Preparation and Appraisal of Drainage Projects	
ABEN 517 (3) Drainage Project Contracts	
ABEN 518 (3) Pollution Control for Agriculture	
ABEN 525 (3) Ventilation of Agricultural Structures	
ABEN 530 (3) Fermentation Engineering	

**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 [www.mcgill.ca/minerva](http://www.mcgill.ca/minerva); complete listings can be found in the Courses section of this Calendar.

**6.2 Department of Agricultural Economics**

Raymond Building – Room R3-019  
 Telephone: (514) 398-7820  
 Website: [www.agrenv.mcgill.ca/agrecon](http://www.agrenv.mcgill.ca/agrecon)

*Chair* — John C. Henning

*Associate Professors* — Laurence Baker, Kisan R. Gunjal, John C. Henning, Paul Thomassin

*Lecturers* — Joan Marshall, Robert Oxley

**AGRICULTURAL ECONOMICS MAJOR**

Increasingly complex economic problems facing the agriculture and food system and our natural environment have intensified the need for specialized knowledge and training in the field of agricultural economics. The curriculum is designed to provide students with the knowledge, analytical and decision-making skills required

in a career in agribusiness, resource management, international development, and research. The selection of courses from the agribusiness, agricultural system or natural resource economics options permits a degree of specialization along those lines, in conjunction with the core courses listed below.

Graduates are eligible to apply for membership in l'Ordre des agronomes du Québec (OAQ) if they fulfill the agronomic course requirements (consult the academic adviser).

**Core Required Courses:** 39 credits.  
**Core Complementary Courses:** 12 credits.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>39</b>
AGEC 200 Principles of Microeconomics	3
AGEC 201 Principles of Macroeconomics	3
AGEC 230 Agricultural and Food Marketing	3
AGEC 231 Economic Systems of Agriculture	3
AGEC 242 Management Theories and Practices	3
AGEC 320 Economics of Agricultural Production	3
AGEC 333 Resource Economics	3
AGEC 343 Accounting and Cost Control	3
AGEC 425 Agricultural Econometrics	3
AGEC 430 Agriculture, Food and Resource Policy	3
AGEC 440 Advanced Agriculture and Food Marketing	3
AGEC 442 Economics of International Agricultural Development	3
AGEC 491 Research Seminar in Agricultural Economics	3

<b>Complementary Courses:</b>	<b>12</b>
One course in introductory statistics course (approved by adviser)	3
plus 9 credits chosen from the following list	9
ABEN 300 (3) Elements of Agricultural Engineering	
ANSC 250 (3) Principles of Animal Science	
FDSC 200 (3) Introduction to Food Science	
PLNT 211 (3) Principles of Plant Science	
SOIL 210 (3) Principles of Soil Science	

**AGRIBUSINESS OPTION**

Whether one has interests in agricultural supply, production, marketing, finance, food processing or retailing, professional management skills are the key to success. The agribusiness option prepares students for managerial responsibility by drawing on the resources of both the Faculty of Management and the Faculty of Agricultural and Environmental Sciences. This special partnership provides students with not only a first-class business training but also a specialization in the field of agriculture.

**Core Required and Complementary Courses:** 51 credits.  
**Option Required and Complementary Courses:** 21 credits.  
**Electives:** to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Option Required Courses:</b>	<b>12</b>
AGEC 331 Farm Business Management	3
AGEC 350 Agricultural Finance	3
AGEC 450 Agriculture Business Management	3
AGEC 453 Venture Capital Opportunities	3
<b>Option Complementary Courses:</b>	<b>9</b>
9 credits chosen from the following list:	9
ACCT 311 (3) Financial Accounting 1	
ACCT 313 (3) Management Accounting 1	
AGEC 344 (3) Entrepreneurial Leadership	
BUSA 364 (3) Business Law 1	
FINE 448 (3) Derivatives and Risk Management	
MGCR 341 (3) Finance 1	
MGCR 382 (3) International Business	
MRKT 451 (3) Marketing Research	
NUTR 446 (3) Applied Human Resources	



**AGRICULTURAL SYSTEMS OPTION**

The smooth functioning of the agriculture and food system requires good market analysis and appropriate policy and program development and management in the public sector. Agricultural economists are called upon to perform these tasks, utilizing their knowledge of the economic forces that affect the industry and the methods of analysis to predict the outcome of the numerous changes that occur. The agricultural systems orientation is intended to provide students with a broad understanding of the many dimensions of agriculture and food systems, including economic development, international agriculture, and food and agricultural policy.

**Core Required and Complementary Courses:** 51 credits.  
**Option Required and Complementary Courses:** 21 credits.  
**Electives:** to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Option Required Courses:</b>	<b>12</b>
AGEC 331 Farm Business Management	3
AGEC 350 Agricultural Finance	3
AGEC 450 Agriculture Business Management	3
AGRI 340 Principles of Ecological Agriculture	3
<b>Option Complementary Courses:</b>	<b>9</b>
9 credits chosen from the following list:	9
AGEC 344 (3) Entrepreneurial Leadership	
AGRI 210 (3) Agro-Ecological History	
AGRI 411 (3) International Agriculture	
AGRI 435 (3) Soil and Water Quality Management	
ENVR 201 (3) Society and Environment	
ENVR 203 (3) Knowledge, Ethics and Environment	
NUTR 207 (3) Nutrition and Health	

**NATURAL RESOURCE ECONOMICS OPTION**

This option integrates biological sciences and environmental decision making with the economics of natural resource use and development. The natural resource economics option is intended to prepare students for careers in the management of natural resources and the analysis of natural resource problems and policies.

**Core Required and Complementary Courses:** 51 credits.  
**Option Required and Complementary Courses:** 32 credits.  
**Electives:** to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Option Required Courses:</b>	<b>12</b>
AEBI 205 Principles of Ecology	3
AEMA 306 Mathematical Methods in Ecology	3
WILD 333 Physical and Biological Aspects of Pollution	3
WILD 437 Assessing Environmental Impact	3
<b>Option Complementary Courses:</b>	<b>9</b>
9 credits chosen from the following list:	9
AEPH 201 (3) Introductory Meteorology	
AGEC 344 (3) Entrepreneurial Leadership	
AGRI 210 (3) Agro-Ecological History	
ECON 405 (3) Natural Resource Economics	
ENVR 203 (3) Knowledge, Ethics and Environment	
NUTR 361 (3) Environmental Toxicology	
WILD 415 (3) Conservation Law	
WILD 421 (3) Wildlife Conservation	

**MINOR IN AGRICULTURAL ECONOMICS**

A Minor in Agricultural Economics will complement a student's education in four ways. First, as a social science, Economics will provide an alternative perspective for students in the Faculty. Second, the Minor will provide an excellent foundation of the workings of the economy at large. Third, it will aid students to understand the business environment surrounding the agri-food

industry. Finally, it will challenge students to analyze the interaction between the agricultural economy and the natural resource base.

**General Regulations:**

To obtain a Minor in Agricultural Economics, students must:

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

**Required Courses:** 12 credits  
**Complementary Courses:** 12 credits

	<b>CREDITS</b>
<b>Required Courses</b>	<b>12</b>
AGEC 200 Principles of Microeconomics	3
AGEC 201 Principles of Macroeconomics	3
AGEC 230 Agricultural and Food Marketing	3
AGEC 231 Economic Systems of Agriculture	3
<b>Complementary Courses</b>	<b>12</b>
Chosen in consultation with the academic adviser for the Minor from the offerings of the Department of Agricultural Economics.	
AGEC 242 (3) Management Theories and Practices	
AGEC 320 (3) Economics of Agriculture Production	
AGEC 331 (3) Farm Business Management	
AGEC 333 (3) Resource Economics	
AGEC 343 (3) Accounting and Cost Control	
AGEC 350 (3) Agricultural Finance	
AGEC 425 (3) Agricultural Econometrics	
AGEC 430 (3) Agriculture, Food and Resource Policy	
AGEC 440 (3) Advanced Agricultural and Food Marketing	
AGEC 442 (3) Economics of International Development	
AGEC 450 (3) Agriculture Business Management	
AGEC 491 (3) Research Seminar in Agricultural Economics	
AGEC 492 (3) Special Topics in Agricultural Economics	

**Minor in Entrepreneurship**

Academic Adviser: Robert Oxley

The Minor is concerned with the genesis and development of entrepreneurial activities. It deals with marketing, finance, organization, and policy in the development and expansion of small businesses in the agri-food and environment sectors. This 24-credit Minor will be of interest to students who wish to develop the skills and perspectives necessary to be successful in an entrepreneurial environment, whether it be self-employed in a start-up business or within an established corporation that employs entrepreneurial management strategies.

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 the requirements of the Minor.

**General Regulations:**

To obtain a Minor in Entrepreneurship, 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 listed below.
- b) Complete the 24 credits listed below, of which not more than 6 credits may be counted for both the Major and the Minor programs.

**Required Courses** (24 credits)

- AGEC 200 (3) Principles of Microeconomics
- AGEC 230 (3) Agricultural and Food Marketing
- AGEC 242 (3) Management Theories and Practices
- AGEC 343 (3) Accounting and Cost Control
- AGEC 344 (3) Entrepreneurial Leadership
- AGEC 450 (3) Agriculture Business Management
- AGEC 453 (3) Venture Capital Opportunities
- NUTR 446 (3) Applied Human Resources

**CERTIFICATE IN ENTREPRENEURSHIP**

Academic Adviser: Robert Oxley

This 30-credit Certificate Program is very similar to the Minor Program and is concerned with the genesis and development of entrepreneurial activities. It deals with marketing, finance, organization, and policy in the development and expansion of small businesses in the agri-food and environment sectors. The Certificate will be of interest to students who already hold a bachelor's degree and wish to develop the skills and perspectives necessary to be successful in an entrepreneurial environment, whether it be self-employed in a start-up business or within an established corporation that employs entrepreneurial management strategies.

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 in Entrepreneurship are not permitted to register for this program.

**General Regulations**

To obtain a Certificate in Entrepreneurship, students must offer a minimum total of 30 credits from the courses as given below.

**Required Courses:** 27 credits.

**Complementary Course:** 3 credits

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>27</b>
AGEC 200 Principles of Microeconomics	3
AGEC 230 Agricultural and Food Marketing	3
AGEC 242 Management Theories and Practices	3
AGEC 343 Accounting and Cost Control	3
AGEC 344 Entrepreneurial Leadership	3
AGEC 450 Agriculture Business Management	3
AGEC 453 Venture Capital Opportunities	3
AGEC 492 Special Topics in Agricultural Economics	3
NUTR 446 Applied Human Resources	3

**Complementary Course:** **3**

one of the following courses:

- ENVR 201 (3) Society and Environment
- ENVR 203 (3) Knowledge, Ethics and Environment
- RELG 270 (3) Religious Ethics and the Environment

**6.3 Department of Animal Science**

Macdonald Stewart Building - Room MS1-084  
 Telephone: (514) 398-7794  
 E-mail: [animal.science@mcgill.ca](mailto:animal.science@mcgill.ca)  
 Website: [www.mcgill.ca/animal](http://www.mcgill.ca/animal)

*Chair* — Xin Zhao

*Emeritus Professor* — John E. Moxley

*Professors* — Roger B. Buckland, Eduardo R. Chavez, Bruce R. Downey, Kwet Fane Ng Kwai Hang, Flannan Hayes, Urs Kuhnlein

*Associate Professors* — Roger I. Cue, Humberto G. Monardes, Leroy E. Phillip, Kevin Wade, David Zadworny, Xin Zhao (*William Dawson Scholar*)

*Assistant Professors* — Vilceu Bordignon, René Lacroix (PT), Arif F. Mustafa

*Associate Member* — Ri-Cheng Chian

*Adjunct Professors* — Pierre Lacasse, Daniel Lefebvre, Bruce Murphy, Denis Petitclerc, Jeffrey Turner

The Department of Animal Science offers Majors in Animal Science and Animal Biology.

**ANIMAL SCIENCE MAJOR**

Academic Advisers: K.F. Ng-Kwai-Hang (U1), E.R. Chavez (U2), J.F. Hayes (U3)

The curriculum in Animal Science involves intensive training in both the basic and applied biological sciences as related to domestic animals and qualifies the graduate for membership in l'Ordre des agronomes du Québec and other professional organizations. Graduates generally enter agricultural industries, mainly sales and marketing, government service (Provincial or Federal), extension, teaching or post-graduate studies. Some students go on to study veterinary medicine. Students are strongly advised to obtain at least 3 months practical experience on a commercial live-stock farm before graduation.

**Required Courses:** 63 credits.

**Complementary Courses:** 6 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>63</b>
ABEN 322 Food Production/Processing Waste Management	3
AEMA 310 Statistical Methods 1	3
AGEC 200 Principles of Microeconomics	3
AGRI 341 Ecological Agriculture Systems	3
ANSC 250 Principles of Animal Science	3
ANSC 301 Principles of Animal Breeding	3
ANSC 312 Animal Health and Disease	3
ANSC 323 Mammalian Physiology	4
ANSC 324 Animal Reproduction	3
ANSC 330 Fundamentals of Nutrition	3
ANSC 433 Animal Nutrition	3
ANSC 450 Dairy Cattle Production	3
ANSC 452 Beef Cattle and Sheep Production	3
ANSC 454 Swine Production	3
ANSC 456 Poultry Production	3
ANSC 495D1 Seminar	1
ANSC 495D2 Seminar	1
FDSC 211 Biochemistry 1	3
MICR 230 Microbial World	3
PLNT 211 Principles of Plant Science	3
SOIL 210 Principles of Soil Science	3
WILD 375 Issues: Environmental Sciences	3

**Complementary Courses:** **6**

One Ethics course: 3

- ENVR 203 (3) Knowledge, Ethics and Environment
- or RELG 270 (3) Religious Ethics and the Environment

One additional Economics course 3

**ANIMAL BIOLOGY MAJOR**

Academic Adviser: H. Monardes

The Animal Biology Major is directed towards students who wish to further their studies in the basic biology of the larger mammals and birds. Successful completion of the program will enable students to qualify in applying to most professional schools in North America, to post-graduate schools in a variety of biological-oriented programs, and to work in most laboratory settings. The program is not intended for students wishing to become professional agrologists.

**Required Courses:** 34 credits

**Complementary Courses:** 24 credits, minimum

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>34</b>
AEBI 202 Cellular Biology	3
AEMA 310 Statistical Methods 1	3
ANSC 234 Biochemistry 2	3
ANSC 250 Principles of Animal Science	3
ANSC 251 Comparative Anatomy	3
ANSC 323 Mammalian Physiology	4
ANSC 330 Fundamentals of Nutrition	3
ANSC 495D1 Seminar	1
ANSC 495D2 Seminar	1
CELL 204 Genetics	4
FDSC 211 Biochemistry 1	3
MICR 230 Microbial World	3

**Complementary Courses:** min. 24

A minimum of 24 credits selected from the following list in consultation with the Academic Adviser:

ANSC 312 (3) Animal Health and Disease
ANSC 324 (3) Animal Reproduction
ANSC 424 (3) Metabolic Endocrinology
ANSC 433 (3) Animal Nutrition
ANSC 460 (3) Biology of Lactation
MICR 341 (3) Mechanisms of Pathogenicity
NRSC 550 (3) Veterinary and Medical Entomology
PARA 400 (3) Eukaryotic Cells and Viruses
PARA 438 (3) Immunology
WILD 410 (3) Wildlife Ecology
ZOOL 307 (3) Natural History of Vertebrates
ZOOL 311 (3) Ethology
ZOOL 424 (3) Parasitology
or WILD 350 (3) Mammalogy

The student may replace up to 12 credits of the complementary courses listed above by choosing, with the student adviser's approval, any course offerings (300 level or higher) in Anatomy and Cell Biology, Biochemistry, Biology, Microbiology and Immunology, Neurology and Neurosurgery, Pharmacology and Therapeutics, Physiology, and Psychology. Any prerequisites for these courses must be taken as electives.

#### 6.4 School of Dietetics and Human Nutrition

Macdonald Stewart Building – Room MS2-039

Telephone: (514) 398-7842

E-mail: [dietstage@macdonald.mcgill.ca](mailto:dietstage@macdonald.mcgill.ca)

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

*Director* — Katherine Gray-Donald

*Emeritus Professor* — Helen R. Neilson

*Professors* — Timothy A. Johns, Peter J.H. Jones, Harriet V. Kuhnlein

*Associate Professors* — Laurie Chan (*NSERC Northern Research Chair*), Grace Egeland (*Canada Research Chair*), Katherine Gray-Donald, Kristine G. Koski, Stan Kubow, Louise Thibault, Linda Wykes (*William Dawson Scholar*)

*Lecturers* — Lynda Fraser (PT), Linda Jacobs Starkey, Maureen Rose-Lucas, Joane Routhier, Sandy Phillips, Hugues Plourde, Heidi Ritter, Donna Schafer

*Adjunct Professors* — Kevin A. Cockell, Jeffrey S. Cohn, Marie L'Abbeé

*Cross-Appointed Staff* —

Food Science and Agricultural Chemistry: Selim Kermasha

Medicine: Louis Beaumier, Franco Carli, Katherine Cianflone, Réjeanne Gougeon, L. John Hoffer, Errol Marliss, Jean-François Yale

Parasitology: Marilyn E. Scott

Psychiatry: Simon Young

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.

#### DIETETICS MAJOR

Academic Advising Coordinator:

Linda Jacobs Starkey, Ph.D., RD, FDC

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 in the province of Quebec. As clinical nutritionists, dietitians may work in health-care settings and food service centres, 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. Postgraduate programs are available to qualified graduates. The duration of the program is three and one-half years.

Successful graduates are qualified for membership in Dietitians of Canada and the Ordre professionnelle de diététistes du Québec. Forty weeks supervised professional experience in clinical and community nutrition and food service systems management are included.

**Required Courses:** 103 credits.

Note: 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.

**Complementary Courses:** 6 credits.

**Electives:** 6 credits, selected in consultation with an Academic Adviser, to meet the minimum 115-credit requirement for the degree.

	<b>CREDITS</b>
<b>Term 1</b>	<b>15</b>
AGEC 242 Management Theories and Practices	3
FDSC 211 Biochemistry 1	3
NUTR 207 Nutrition and Health	3
NUTR 214 Food Fundamentals	3
One Elective or Complementary (see list below)	3
<b>Term 2</b>	<b>16</b>
ABEN 251 Microcomputer Applications	3
ANSC 234 Biochemistry 2	3
MICR 230 Microbial World	3
NUTR 208* Stage in Dietetics 1	1
NUTR 217 Application: Food Fundamentals	3
One Elective or Complementary (see list below)	3
<b>Summer</b>	<b>3</b>
NUTR 209* Professional Practice Stage 1B	3
<b>Term 3</b>	<b>17</b>
AEMA 310 Statistical Methods 1	3
AGEC 343 Accounting and Cost Control	3
ANSC 323 Mammalian Physiology	4
ANSC 330 Fundamentals of Nutrition	3
NUTR 322 Applied Sciences Communications	2
NUTR 345 Food Service Systems Management	2

<b>Term 4</b>		<b>16</b>
ANSC 424 Metabolic Endocrinology	3	
NUTR 310* Stage in Dietetics 2A	1	
NUTR 337 Nutrition Through Life	3	
NUTR 344 Clinical Nutrition 1	4	
NUTR 346 Quantity Food Production	2	
One Elective or Complementary (see list below)	3	
<b>Summer</b>		<b>5</b>
NUTR 311* Stage in Dietetics 2B	5	
<b>Term 5</b>		<b>17</b>
NUTR 403 Nutrition in Society	3	
NUTR 445 Clinical Nutrition 2	5	
NUTR 446 Applied Human Resources	3	
NUTR 450 Research Methods: Human Nutrition	3	
One Elective or Complementary (see list below)	3	
<b>Term 6</b>		<b>12</b>
NUTR 409* Stage in Dietetics 3	8	
NUTR 436 Nutritional Assessment	2	
NUTR 438 Interviewing and Counselling	2	
<b>Term 7</b>		<b>14</b>
NUTR 410* Professional Practice - Stage 4	14	

**Two Complementary Courses are to be selected from the following, as specified**

3 credits of Human Behavioural Science courses chosen from:  
 NUTR 301 (3) Psychology  
 or equivalent course from another faculty.

3 credits from the social sciences:

- AGEC 200 (3) Principles of Microeconomics
- AGEC 230 (3) Agricultural and Food Marketing
- ENVR 201 (3) Society and Environment
- ENVR 203 (3) Knowledge, Ethics and Environment
- RELG 270 (3) Religious Ethics and the Environment

**Elective Courses:**

Two Elective courses should be chosen in consultation with the academic adviser. The following courses most often fit the timetable; elective choice is not limited to these courses.

- FDSC 200 (3) Introduction to Food Science
- FDSC 212 (3) Biochemistry Laboratory
- FDSC 251 (3) Food Chemistry 1
- FDSC 425 (3) Principles of Quality Assurance
- NUTR 420 (3) Toxicology and Health Risks
- NUTR 430 (3) Directed Studies: Dietetics and Nutrition 1
- NUTR 501 (3) Nutrition in Developing Countries
- NUTR 511 (3) Nutrition and Behaviour
- NUTR 512 (3) Herbs, Foods and Phytochemicals

\* Successful completion of all component parts of each level of Stage (Professional Practice) in Dietetics courses 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 2.50. Visiting students must contact the Academic Advising Coordinator (Dietetics) regarding course registration eligibility.

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 at any time if it (Faculty) feels the student has displayed unprofessional conduct or demonstrates incompetence.

**A compulsory immunization program** exists at McGill which is required for Dietetics students to practice. Students should complete their immunization before arriving at Macdonald Campus; medical/health documentation must be received prior to commencement of Stage.

**NUTRITION MAJOR**

Academic Advising Coordinator: Kristine G. Koski

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 develop specialization in nutritional biochemistry, nutrition and populations or nutrition of food.

Graduates normally will continue on to further studies preparing for careers in research, medicine or as specialists in nutrition.

Aside from working as university teachers and researchers, graduates with advanced degrees may be employed by government and health protection agencies, in world development programs, or by the food sector.

**Required Courses:** 52 credits.

Note: The School firmly applies prerequisite requirements for registration in all required courses in the Nutrition Major. All required courses must be passed with a minimum grade of C.

**Option Required and Complementary Courses:** 12 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90 credit requirement for the degree.

		<b>CREDITS</b>
<b>Term 1</b>		<b>11</b>
FDSC 211 Biochemistry 1		3
FDSC 212 Biochemistry Laboratory		2
NUTR 207 Nutrition and Health		3
NUTR 214 Food Fundamentals		3
<b>Term 2</b>		<b>12</b>
ABEN 251 Microcomputer Applications		3
ANSC 234 Biochemistry 2		3
MICR 230 Microbial World		3
NUTR 217 Application: Food Fundamentals		3
<b>Term 3</b>		<b>12</b>
AEMA 310 Statistical Methods 1		3
ANSC 323 Mammalian Physiology		4
ANSC 330 Fundamentals of Nutrition		3
NUTR 322 Applied Sciences Communication		2
<b>Term 4</b>		<b>9</b>
ANSC 424 Metabolic Endocrinology		3
NUTR 337 Nutrition Through Life		3
NUTR 344 Clinical Nutrition 1		3
<b>Term 5</b>		<b>6</b>
NUTR 450 Research Methods: Human Nutrition		3
NUTR 451 Analysis of Nutritional Data		3
<b>Term 6</b>		<b>2</b>
NUTR 436 Nutritional Assessment		2

**Additional required and complementary courses, 12 credits.**  
 Students must select one of the following three options as part of their program.

		<b>CREDITS</b>
<b>Nutritional Biochemistry Option:</b>		<b>12</b>
Term 5 ANSC 552 Protein Metabolism and Nutrition		3
Term 5 ANSC 551 Carbohydrate and Lipid Metabolism		3
Term 3 or 5 AEPH 303 Advances in Atomic and Nuclear Science		3
AEPH 405 Tracer Techniques		3
<b>Nutrition and Populations Option:</b>		<b>12</b>
Term 5 NUTR 406 Ecology of Human Nutrition		3
Term 6 NUTR 403 Nutrition in Society		3
Select 6 credits from those listed below or any other social science courses:		6
NUTR 301 (3) Psychology		
ENVR 203 (3) Knowledge, Ethics and Environment		



<b>Nutrition of Food Option:</b>	<b>12</b>
Term 2 or 4 FDSC 334 Analytical Chemistry 2	3
Term 4 FDSC 251 Food Chemistry 1	3
Term 5 FDSC 300 Food Analysis 1	3
Term 6 FDSC 315 Food Analysis 2	3

**Electives:** Selected in consultation with the academic adviser to meet the minimum 90 credits for the degree.

### MINOR IN HUMAN NUTRITION

Academic Adviser: Linda Wykes

The Minor in Human Nutrition is intended to complement a student's primary field of study by providing a focused introduction to the metabolic aspects of human nutrition. It is particularly accessible to students in Biochemistry, Biology, Physiology, Anatomy and Cell Biology, Microbiology and Immunology, Animal Science or Food Science programs. The completion of 24 credits is required, of which at least 18 must not overlap with the primary program. All courses must be taken in the appropriate sequence and passed with a minimum grade of C. Students may declare their intent to follow the Minor program at the beginning of their U2 year. They must then consult with the Academic Adviser for the Human Nutrition Minor in the School of Dietetics and Human Nutrition to obtain approval for their course selection. Since not all courses are offered every year and many have prerequisites, students are cautioned to plan their program in advance.

The Minor program does not carry professional recognition, therefore, it is not suitable for students wishing to become nutritionists or dietitians. However, successful completion may enable students to qualify for many post-graduate nutrition programs.

**Required Courses:** 6 credits.

**Complementary Courses:** 18 or 19 credits

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>6</b>
NUTR 337 Nutrition Through Life	3
NUTR 450 Research Methods: Human Nutrition	3
<b>Complementary Courses:</b>	<b>18 or 19</b>
3 credits in biochemistry, one of:	
ANSC 234 (3) Biochemistry 2	
BIOC 311 (3) Metabolic Biochemistry	
3 or 4 credits in physiology, one of:	
ANSC 323 (4) Mammalian Physiology	
PHGY 210 (3) Mammalian Physiology 2	
PHGY 202 (3) Human Physiology: Body Functions	
3 credits in nutrition, one of:	
ANSC 330 (3) Fundamentals of Nutrition	
NUTR 307 (3) Human Nutrition	
8 or 9 credits from the following list:	
ANSC 551 (3) Carbohydrate and Lipid Metabolism	
ANSC 552 (3) Protein Metabolism and Nutrition	
IMED 300 (3) Human Disease	
MIMM 314 (3) Immunology	
or PARA 438(3) Immunology	
NUTR 406 (3) Ecology of Human Nutrition	
NUTR 451 (3) Analysis of Nutrition Data	
NUTR 436 (2) Nutritional Assessment	
NUTR 420 (3) Toxicology and Health Risks	
NUTR 512 (3) Herbs, Foods and Phytochemicals	
NUTR 501 (3) Nutrition in Developing Countries	
NUTR 430 (3) Directed Studies: Dietetics and Nutrition 1	
or NUTR 431(3) Directed Studies: Dietetics and Nutrition 2	

#### Notes:

- 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.
- Not all courses are offered every year. For information on available courses, consult Class Schedule at [www.mcgill.ca/minerva](http://www.mcgill.ca/minerva); complete listings can be found in the Courses section of this Calendar.

### 6.5 Department of Food Science and Agricultural Chemistry

Macdonald Stewart Building – Room MS1-034

Telephone: (514) 398-7898

E-mail: [foodscience@macdonald.mcgill.ca](mailto:foodscience@macdonald.mcgill.ca)

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

Chair — TBA

**Professors** — Inteaz Alli, William D. Marshall,  
Hosahalli S. Ramaswamy, James P. Smith,  
Frederik R. van de Voort

**Associate Professors** — Ashraf A. Ismail, Selim Kermasha,  
Benjamin K. Simpson, Varoujan Yaylayan

**Adjunct Professors** — John W. Austin, Byong H. Lee,  
Yasuo Konishi, Michèle Marcotte, André Morin,  
J.R. Jocelyn Paré

#### FOOD SCIENCE MAJOR

This program is intended for those students interested in the multi-disciplinary 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 and the Institute of Food Technologists. Graduates can also qualify for admission to the Ordre des chimistes du Québec by careful selection of additional courses.

**Required Courses:** 66 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree. A portion of these credits should be in the humanities/social sciences.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>66</b>
ABEN 251 Microcomputer Applications	3
ABEN 324 Elements of Food Engineering	3
AEMA 310 Statistical Methods 1	3
FDSC 200 Introduction to Food Science	3
FDSC 211* Biochemistry 1	3
FDSC 213 Analytical Chemistry 1	3
FDSC 233 Physical Chemistry	3
FDSC 251 Food Chemistry 1	3
FDSC 300 Food Analysis 1	3
FDSC 305 Food Chemistry 2	3
FDSC 310 Post Harvest Fruit and Vegetable Technology	3
FDSC 315 Food Analysis 2	3
FDSC 319 Food Chemistry 3	3
FDSC 330 Food Processing	3
FDSC 334 Analytical Chemistry 2	3
FDSC 400 Food Packaging	3
FDSC 410 Flavour Chemistry	3
FDSC 425 Principles of Quality Assurance	3
FDSC 495D1 Food Science Seminar	1.5
FDSC 495D2 Food Science Seminar	1.5
MICR 230 Microbial World	3
MICR 442 Food Microbiology and Sanitation	3
NUTR 207 Nutrition and Health	3

\* Students who have not taken CEGEP objective 00XV or equivalent (formerly Chemistry 202) must take Organic Chemistry (FDSC 230) as a prerequisite for FDSC 211.

The following courses must be taken by students who wish to meet the course requirements for admission to the Ordre des chimistes du Québec.

FDSC 212	(2)	Biochemistry Laboratory
FDSC 230	(4)	Organic Chemistry
FDSC 490	(3)	Research Project 1
FDSC 491	(3)	Research Project 2
FDSC 510	(3)	Food Hydrocolloid Chemistry
FDSC 515	(3)	Enzyme Thermodynamics/Kinetics
FDSC 520	(3)	Biophysical Chemistry of Food

### 6.6 Interdisciplinary Studies

Ecological Agriculture Program

Telephone: (514) 398-7928

Website: [www.agrenv.mcgill.ca/agrecon/ecoagr](http://www.agrenv.mcgill.ca/agrecon/ecoagr)

#### MINOR IN ECOLOGICAL AGRICULTURE

Academic Adviser: Professor J. Henning

This Minor program 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 post graduate studies in this field.

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, 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 the requirements of the Minor.

#### 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.

**Complementary Courses:** 15 credits.

		<b>CREDITS</b>
<b>Required Courses:</b>		
AGRI 210	Agro-Ecological History	3
AGRI 340	Principles of Ecological Agriculture	3
AGRI 341	Ecological Agriculture Systems	3
<b>Complementary Courses:</b>		
15 credits chosen from the following, in consultation with the Academic Adviser for Ecological Agriculture		
with at least 3 credits chosen from:		
NRSC 521	(3) Soil Microbiology and Biochemistry	3-9
SOIL 335	(3) Soil Ecology and Management	
SOIL 490	(3) Plan global de fertilisation intégrée	
and the remaining credits to be chosen from:		
AEBI 205	(3) Principles of Ecology	6-12
AGEC 333	(3) Resource Economics	
AGRI 435	(3) Soil and Water Quality Management	
AGRI 491D1	(1.5) Co-op Experience	
AGRI 491D2	(1.5) Co-op Experience	
ENTO 352	(3) Control of Insect Pests	
MICR 331	(3) Microbial Ecology	
NUTR 512	(3) Herbs, Foods and Phytochemicals	
PLNT 300	(3) Cropping Systems	

PLNT 361	(3)	Pest Management and the Environment
PLNT 434	(3)	Weed Biology and Control
PLNT 460	(3)	Plant Ecology
RELG 270	(3)	Religious Ethics and the Environment
WILD 375	(3)	Issues: Environmental Sciences
WOOD 410	(3)	The Forest Ecosystem
ZOOL 311	(3)	Ethology

#### CERTIFICATE IN ECOLOGICAL AGRICULTURE

Academic Adviser: Professor J. Henning

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 in Ecological Agriculture are not permitted to register for this program.

#### General Regulations

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

**Required Courses:** 9 credits.

**Complementary Courses:** 21 credits.

		<b>CREDITS</b>
<b>Required Courses:</b>		
AGRI 210	Agro-Ecological History	3
AGRI 340	Principles of Ecological Agriculture	3
AGRI 341	Ecological Agriculture Systems	3
<b>Complementary Courses:</b>		
21 credits chosen from the following, in consultation with the Academic Adviser for Ecological Agriculture		
with at least 3 credits chosen from:		
NRSC 521	(3) Soil Microbiology and Biochemistry	3-9
SOIL 335	(3) Soil Ecology and Management	
SOIL 490	(3) Plan global de fertilisation intégrée	
and the remaining credits to be chosen from:		
AEBI 205	(3) Principles of Ecology	12-18
AGEC 333	(3) Resource Economics	
AGRI 435	(3) Soil and Water Quality Management	
AGRI 491D1	(1.5) Co-op Experience	
AGRI 491D2	(1.5) Co-op Experience	
ENTO 352	(3) Control of Insect Pests	
MICR 331	(3) Microbial Ecology	
NUTR 512	(3) Herbs, Foods and Phytochemicals	
PLNT 300	(3) Cropping Systems	
PLNT 361	(3) Pest Management and the Environment	
PLNT 434	(3) Weed Biology and Control	
PLNT 460	(3) Plant Ecology	
RELG 270	(3) Religious Ethics and the Environment	
WILD 375	(3) Issues: Environmental Sciences	
WOOD 410	(3) The Forest Ecosystem	
ZOOL 311	(3) Ethology	

#### Notes:

- 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.
- Not all courses are offered every year. For information on available courses, consult Class Schedule at [www.mcgill.ca/minerva](http://www.mcgill.ca/minerva); complete listings can be found in the Courses section of this Calendar.
- Students using AGRI 491D1/AGRI 491D2 towards the requirements of the Certificate/Minor are limited to an experience on

farms or other enterprises that are either organic, biodynamic, or practicing permaculture. The placement must be approved by the academic adviser for the Certificate/Minor.

4. NRSC 521 is an alternate year course.

### AGRICULTURAL SCIENCES MAJORS

Academic Adviser: Katherine McClintock  
 Department of Plant Science  
 Telephone: (514) 398-0869 ext. 7872

The Agricultural Sciences Majors are designed to provide students with a broad appreciation of the scientific and applied aspects of modern agriculture and the flexibility to pursue individual interests.

Students can choose to keep their summers free in the Agricultural Sciences Major (90 credits) or gain valuable practical summer field experience (and obtain additional course credit) in the Agricultural Sciences Internship Major (102 credits).

Both majors consist of a similar core of required courses that lead to accreditation from the Ordre des agronomes du Québec.

Students in the Agricultural Sciences Majors can enrol in the General option, or obtain more specialized experience by selecting the Ecological Agriculture, International Agriculture, or Soil Science Options.

#### AGRICULTURAL SCIENCES MAJOR – GENERAL OPTION (90 credits)

**Required Courses:** 52 credits.

**Complementary Courses:** 19 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>52</b>
ABEN 300 Elements of Agricultural Engineering	3
AEMA 310 Statistical Methods 1	3
AGEC 200 Principles of Microeconomics	3
AGEC 231 Economic Systems of Agriculture	3
AGRI 210 Agro-Ecological History	3
AGRI 220 Professional Practice Seminar 1	0.5
AGRI 221 Professional Practice Seminar 2	0.5
AGRI 320 Professional Practice Seminar 3	0.5
AGRI 321 Professional Practice Seminar 4	0.5
AGRI 420 Professional Practice Seminar 5	0.5
AGRI 421 Professional Practice Seminar 6	0.5
AGRI 490 Agri-Food Industry Project	3
ANSC 250 Principles of Animal Science	3
CELL 204 Genetics	4
ENTO 352 Control of Insect Pests	3
FDSC 211 Biochemistry 1	3
MICR 230 Microbial World	3
PLNT 211 Principles of Plant Science	3
PLNT 300 Cropping Systems	3
RELG 270 Religious Ethics and the Environment	3
SOIL 210 Principles of Soil Science	3
SOIL 315 Soil Fertility and Fertilizers	3

**Complementary Courses:** **19**

at least one of:

ANSC 323 (4) Mammalian Physiology	
PLNT 353 (4) Plant Structure and Function	

at least one production course in Agricultural Science:

AGEC 331 (3) Farm Business Management	
ANSC 450 (3) Dairy Cattle Production	
ANSC 452 (3) Beef Cattle and Sheep Production	
ANSC 454 (3) Swine Production	
ANSC 456 (3) Poultry Production	
PLNT 331 (3) Field Crops	

plus a minimum of 12 credits chosen in consultation with the Academic Adviser from courses with Subject Codes AGRI, AGECE, ABEN, AEPH, ANSC, ENTO, PLNT, and SOIL.

#### AGRICULTURAL SCIENCES INTERNSHIP MAJOR – GENERAL OPTION (102 credits)

**Required Courses:** 64 credits.

**Complementary Courses:** 19 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 102-credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>64</b>
All of the required courses (52 credits) specified for the Agricultural Sciences Major – General Option, with the addition of:	
AGRI 201D1 Agri-Environment Internship	3
AGRI 201D2 Agri-Environment Internship	3
AGRI 301D1 Agrology Internship	3
AGRI 301D2 Agrology Internship	3

**Complementary Courses:** **19**

As described for the Agricultural Sciences Major – General Option.

#### AGRICULTURAL SCIENCES MAJOR – ECOLOGICAL AGRICULTURE OPTION (90 credits)

**Required Courses:** 61 credits.

**Complementary Courses:** 16 - 19 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>61</b>
All of the required courses (52 credits) specified for the Agricultural Sciences Major – General Option, with the addition of:	
AGRI 340 Principles of Ecological Agriculture	3
AGRI 341 Ecological Agriculture Systems	3
AEBI 205 Principles of Ecology	3

**Complementary Courses:** **16 to 19**

at least one of:

ANSC 323 (4) Mammalian Physiology	
PLNT 353 (4) Plant Structure and Function	
at least one production course in Agricultural Science:	
AGEC 331 (3) Farm Business Management	
ANSC 450 (3) Dairy Cattle Production	
ANSC 452 (3) Beef Cattle and Sheep Production	
ANSC 454 (3) Swine Production	
ANSC 456 (3) Poultry Production	
PLNT 331 (3) Field Crops	

at least 3 credits must be chosen from three of the four blocks below:

AGRI 201D1 (3) Agri-Environment Internship	
and AGRI 201D2 (3) Agri-Environment Internship	
AGRI 435 (3) Soil and Water Quality Management	
NRSC 521 (3) Soil Microbiology and Biochemistry	
SOIL 335 (3) Soil Ecology and Management	
SOIL 490 (3) Plan global de fertilisation intégrée	
MICR 331 (3) Microbial Ecology	
PLNT 434 (3) Weed Biology and Control	
PLNT 460 (3) Plant Ecology	
AGEC 333 (3) Resource Economics	
ENVR 201 (3) Society and Environment	
ENVR 400 (3) Environmental Thought	

**AGRICULTURAL SCIENCES INTERNSHIP MAJOR –  
ECOLOGICAL AGRICULTURE OPTION (102 credits)**

**Required Courses:** 73 credits.

**Complementary Courses:** 13 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 102-credit requirement for the degree.

**Required Courses:** **CREDITS**  
**73**

All of the required courses (61 credits) specified for the Agricultural Sciences Major – Ecological Agriculture Option, with the addition of:

AGRI 201D1	Agri-Environment Internship	3
AGRI 201D2	Agri-Environment Internship	3
AGRI 301D1	Agrology Internship	3
AGRI 301D2	Agrology Internship	3

**Complementary Courses:** **CREDITS**  
**13**

at least one of:

ANSC 323	(4) Mammalian Physiology
PLNT 353	(4) Plant Structure and Function

at least one production course in Agricultural Science:

AGEC 331	(3) Farm Business Management
ANSC 450	(3) Dairy Cattle Production
ANSC 452	(3) Beef Cattle and Sheep Production
ANSC 454	(3) Swine Production
ANSC 456	(3) Poultry Production
PLNT 331	(3) Field Crops

at least 3 credits must be chosen from two of the three blocks below:

AGRI 435	(3) Soil and Water Quality Management
NRSC 521	(3) Soil Microbiology and Biochemistry
SOIL 335	(3) Soil Ecology and Management
SOIL 490	(3) Plan global de fertilisation intégrée

MICR 331	(3) Microbial Ecology
PLNT 434	(3) Weed Biology and Control
PLNT 460	(3) Plant Ecology

AGEC 333	(3) Resource Economics
ENVR 201	(3) Society and Environment
ENVR 400	(3) Environmental Thought

**AGRICULTURAL SCIENCES MAJOR –  
INTERNATIONAL AGRICULTURE OPTION (90 credits)**

**Required Courses:** 58 credits.

**Complementary Courses:** 16 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

**Required Courses:** **CREDITS**  
**58**

All of the required courses (52 credits) specified for the Agricultural Sciences Major – General Option, with the addition of:

AGRI 411	International Agriculture	3
AGEC 442	Economics of International Agricultural Development	3

**Complementary Courses:** **CREDITS**  
**16**

at least one of:

ANSC 323	(4) Mammalian Physiology
PLNT 353	(4) Plant Structure and Function

at least one production course in Agricultural Science:

AGEC 331	(3) Farm Business Management
ANSC 450	(3) Dairy Cattle Production
ANSC 452	(3) Beef Cattle and Sheep Production
ANSC 454	(3) Swine Production
ANSC 456	(3) Poultry Production
PLNT 331	(3) Field Crops

a minimum of 9 credits chosen from the following:

ANTH 212	(3) Anthropology of Development
POLI 227	(3) Developing Areas/Introduction
SOCI 254	(3) Development and Underdevelopment
GEOG 216	(3) Geography of the World Economy
GEOG 404	(3) Environmental Management 2
AGRI 341	(3) Ecological Agriculture Systems
AGRI 305	(3) Barbados Agro-Ecosystems
AGEC 430	(3) Agriculture, Food and Resource Policy
NUTR 501	(3) Nutrition in Developing Countries

**AGRICULTURAL SCIENCES INTERNSHIP MAJOR –  
INTERNATIONAL AGRICULTURE OPTION (102 credits)**

**Required Courses:** 70 credits.

**Complementary Courses:** 16 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 102-credit requirement for the degree.

**Required Courses:** **CREDITS**  
**70**

All of the required courses (52 credits) specified for the Agricultural Sciences Major – International Agriculture Option, with the addition of:

AGRI 201D1	Agri-Environment Internship	3
AGRI 201D2	Agri-Environment Internship	3
AGRI 301D1	Agrology Internship	3
AGRI 301D2	Agrology Internship	3

**Complementary Courses:** **CREDITS**  
**16**

As described for the Agricultural Sciences Major – International Agriculture Option.

**AGRICULTURAL SCIENCES MAJOR –  
SOIL SCIENCE OPTION (90 credits)**

**Required Courses:** 52 credits.

**Complementary Courses:** 25 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

**Required Courses:** **CREDITS**  
**52**

All of the required courses (52 credits) specified for the Agricultural Sciences Major – General Option.

**Complementary Courses:** **CREDITS**  
**25**

at least one of:

ANSC 323	(4) Mammalian Physiology
PLNT 353	(4) Plant Structure and Function

at least one production course in Agricultural Science:

AGEC 331	(3) Farm Business Management
ANSC 450	(3) Dairy Cattle Production
ANSC 452	(3) Beef Cattle and Sheep Production
ANSC 454	(3) Swine Production
ANSC 456	(3) Poultry Production
PLNT 331	(3) Field Crops

a minimum of 18 credits chosen from the following:

AGRI 435	(3) Soil and Water Quality Management
ABEN 217	(3) Hydrology and Drainage
SOIL 200	(3) Introduction to Earth Science
SOIL 326	(3) Soil Genesis and Classification
SOIL 331	(3) Soil Physics
SOIL 335	(3) Soil Ecology and Management
SOIL 410	(3) Soil Chemistry
SOIL 521	(3) Soil Microbiology and Biochemistry



**AGRICULTURAL SCIENCES INTERNSHIP MAJOR – SOIL SCIENCE OPTION** (102 credits)

**Required Courses:** 64 credits.

**Complementary Courses:** 25 credits.

**Electives:** selected in consultation with Academic Adviser, to meet the minimum 102-credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>64</b>
All of the required courses (52 credits) specified for the Agricultural Sciences Major – Soil Science, with the addition of:	
AGRI 201D1 Agri-Environment Internship	3
AGRI 201D2 Agri-Environment Internship	3
AGRI 301D1 Agrology Internship	3
AGRI 301D2 Agrology Internship	3
<b>Complementary Courses:</b>	<b>25</b>
As described for the Agricultural Sciences Major – Soil Science Option.	

**6.7 Department of Natural Resource Sciences**

Macdonald Stewart Building – Room MS3-040

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 Website: [www.nrs.mcgill.ca](http://www.nrs.mcgill.ca)
**Chair** — Benoît Côté

**Emeritus Professors** — A. Clark Blackwood, Roger Knowles, Angus F. Mackenzie, Robert A. MacLeod, Peter H. Schuepp, Robin K. Stewart

**Professors** — David M. Bird, Peter Brown (*joint appoint. with Geography and McGill School of Environment*), James W. Fyles (*Tomlinson-Fowler Professor of Forest Ecology*), William H. Hendershot

**Associate Professors** — Benoît Côté, Mark A. Curtis, Brian T. Driscoll, Gary B. Dunphy, David J. Lewis, Guy R. Mehuys, Donald F. Niven, Manfred E. Rau, Rodger D. Titman, Terry A. Wheeler, Lyle Whyte

**Assistant Professors** — Christopher Buddle, Murray Humphries, Ian Strachan, Joann Whalen

**Faculty Lecturer** — Derek Nelligen

**Associate Members** — Laurie Chan (*School of Dietetics and Human Nutrition*), David Green (*Redpath Museum*), William D. Marshall (*Dept. of Food Science and Agricultural Chemistry*), Greg T. Matlashewski (*Dept. of Microbiology and Immunology*), Donald L. Smith (*Dept. of Plant Science*)

**Adjunct Professors** — Robert Anderson, Frederick S. Archibald, Dominique Berteaux, Guy Boivin, Jeffrey Cumming, Charles W. Greer, Thomas Herman, Carlos Miguez, Pierre Mineau, Elizabeth Pattey, Husain Sadar, Jean-Pierre Savard, Anton Scheuhammer, Charles Vincent, Frederick G. Whoriskey

**APPLIED ZOOLOGY MAJOR**

 [Program revisions are under consideration for September 2003. Go to [www.mcgill.ca](http://www.mcgill.ca) (Course Calendars) in July for details.]

Academic Adviser: Professor T. A. Wheeler

The great diversity of animals form the focus of this Major, from the invertebrates, with their many beneficial and pest insects, to vertebrates, including fish and wildlife. The interaction of animals with each other and with human populations is stressed. By careful course selection students may emphasize life in soils or water, entomology, physiology, parasitology or vertebrate biology and ecology. Career opportunities exist in both the public and private sectors in research, program development and implementation, pest control, wildlife management, etc.

**Required Courses:** 27 credits.

**Complementary Courses:** 36 credits.

**Electives:** to meet the minimum requirement of 90 credits; chosen in consultation with the Academic Adviser.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>27</b>
AEBI 200 Biology of Organisms	3
AEBI 202 Cellular Biology	3
AEBI 205 Principles of Ecology	3
AEMA 310 Statistical Methods 1	3
CELL 204 Genetics	4
FDSC 211 Biochemistry 1	3
PLNT 201 Comparative Plant Biology	3
WILD 491D1 Seminar	1
WILD 491D2 Seminar	1
ZOOL 312 Zoological Systematics and Evolution	3
<b>Complementary Courses:</b>	<b>36</b>
36 credits in any combination from List A, B and/or C	

List A (Animal Diversity)

BIOL 327 <sup>1</sup>	(3) Herpetology
BIOL 351 <sup>1</sup>	(3) The Biology of Invertebrates
MICR 230	(3) Microbial World
WILD 350	(3) Mammalogy
WILD 420	(3) Ornithology
ZOOL 307	(3) Natural History of Vertebrates
ZOOL 424	(3) Parasitology

List B (Entomology)

ENTO 352	(3) Control of Insect Pests
ENTO 440	(3) Systematic Entomology
ENTO 525	(3) Insect Ecology
ENTO 535	(3) Aquatic Entomology
NRSC 330	(3) Insect Biology
NRSC 515	(3) Parasitoid Behavioural Ecology
NRSC 520	(3) Insect Physiology
NRSC 550	(3) Veterinary and Medical Entomology

List C (Interactions and Applications)

BIOL 331 <sup>1</sup>	(3) Ecology/Behaviour Field Course
BIOL 465 <sup>1</sup>	(3) Conservation Biology
NRSC 497D1	(2.5) Project 2
NRSC 497D2	(2.5) Project 2
PLNT 358	(3) Flowering Plant Diversity
SOIL 335	(3) Soil Ecology and Management
WILD 401	(3) Fisheries and Wildlife Management
WILD 410	(3) Wildlife Ecology
ZOOL 311	(3) Ethology
ZOOL 313	(3) Zoogeography
ZOOL 315	(3) Science of Inland Waters

<sup>1</sup> Downtown Campus

The following Zoology courses from the Downtown Campus may be substituted for those in the above list of Macdonald Campus Complementary Courses with the prior permission of the Academic Adviser and the Macdonald Committee on Academic Standing. When selecting electives, students are encouraged to consult with their Academic Adviser.

**Department of Biology (Downtown Campus) Courses:**

BIOL 307	(3) Behavioural Ecology/Sociobiology
BIOL 334	(3) Applied Tropical Ecology
BIOL 335	(3) Marine Mammals
BIOL 336	(3) Marine Aquaculture
BIOL 337	(3) Ecology and Behaviour of Fishes
BIOL 352	(3) Vertebrate Evolution
BIOL 437	(3) Advanced Invertebrate Zoology
BIOL 442	(3) Marine Biology

**AFRICAN FIELD STUDY SEMESTER**, see page 276 under the Department of Geography, Faculty of Science, for details of the 15-credit interdisciplinary AFSS. **Note: The AFSS will only be offered in 2003-04 pending approval by the Dean of Science.**

**MACDONALD SUMMER FIELD SEMESTER:  
HUMAN IMPACTS ON THE ENVIRONMENT**

Three courses are available during Summer Session that provide students the opportunity to participate in supervised field research concerning flora and fauna not easily studied at other times of the year, and to apply knowledge from the classroom to environmental issues in the field.

Common thematic elements include: the linkages between physical, biological and human systems, field research, and human impacts on the environment. Students learn and apply research techniques and analytical skills within a multi-disciplinary, holistic approach.

**Summer Term Courses:**

- NRSC 382 (3) Ecological Monitoring and Analysis
- NRSC 383 (3) Land Use: Redesign and Planning
- NRSC 384 (3) Field Research Project

For more information, please consult the *McGill Summer Studies Calendar*, the Summer Studies Website at [www.mcgill.ca/summer](http://www.mcgill.ca/summer), or the Faculty Website at [www.agrenv.mcgill.ca/envschool](http://www.agrenv.mcgill.ca/envschool).

**ENVIRONMENTAL BIOLOGY MAJOR**

[Program revisions are under consideration for September 2003. Go to [www.mcgill.ca](http://www.mcgill.ca) (Course Calendars) in July for details.]

Academic Advisers: Professors J. Fyles (U1), M.E. Rau (U2), D.J. Lewis (U3)

This program provides scientists with basic knowledge in Biology and strong emphasis in Ecology. As ecologists they will be equipped to investigate the scientific aspects of the relationships between organisms and their environment.

**Required Courses:** 29 credits.

**Complementary Courses:** 30 credits.

**Electives:** To meet the minimum requirements of 90 credits for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>29</b>
AEBI 200 Biology of Organisms	3
AEBI 202 Cellular Biology	3
AEBI 205 Principles of Ecology	3
AEBI 495D1 Environmental Biology Seminar	1
AEBI 495D2 Environmental Biology Seminar	1
AEMA 310 Statistical Methods 1	3
CELL 204 Genetics	4
FDSC 211 Biochemistry 1	3
FDSC 212 Biochemistry Laboratory	2
PLNT 201 Comparative Plant Biology	3
WILD 375 Issues: Environmental Sciences	3

**Complementary Courses:** 30

a minimum of 30 credits selected from the following list in consultation with the Academic Adviser

- AEMA 306 (3) Mathematical Methods in Ecology
- AEPH 201 (3) Introductory Meteorology
- MICR 230 (3) Microbial World
- MICR 331 (3) Microbial Ecology
- NRSC 496D1 (1.5) Project 1
- NRSC 496D2 (1.5) Project 1
- PLNT 358 (3) Flowering Plant Diversity
- PLNT 460 (3) Plant Ecology
- SOIL 200 (3) Introduction to Earth Science
- SOIL 210 (3) Principles of Soil Science
- WILD 333 (3) Physical and Biological Aspects of Pollution
- WILD 401 (4) Fisheries and Wildlife Management
- WILD 410 (3) Wildlife Ecology
- WILD 437 (3) Assessing Environmental Impact
- WILD 475 (3) Desert Ecology
- WOOD 410 (3) The Forest Ecosystem
- WOOD 420 (3) Environmental Issues: Forestry
- ZOOL 307 (3) Natural History of Vertebrates

- ZOOL 311 (3) Ethology
- ZOOL 313 (3) Zoogeography
- ZOOL 315 (3) Science of Inland Waters

With the permission of the Academic Adviser and the Committee on Academic Standing, ecological or environmental courses offered on the Downtown Campus may be substituted for those appearing in the above list of Complementary Courses.

**MICROBIOLOGY MAJOR**

[Program revisions are under consideration for September 2003. Go to [www.mcgill.ca](http://www.mcgill.ca) (Course Calendars) in July for details.]

Academic Adviser: Professor D. Niven

Students receive training in fundamental principles and applied aspects of Microbiology. Successful graduates are competent to work in university, government and industrial research laboratories and in the pharmaceutical, fermentation and food industries.

**Required Courses:** 60 credits.

**Electives:** to meet the minimum requirement of 90 credits for the degree; chosen in consultation with the Academic Adviser.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>60</b>
AEBI 200 Biology of Organisms	3
AEBI 202 Cellular Biology	3
AEBI 205 Principles of Ecology	3
AEMA 310 Statistical Methods 1	3
CELL 204 Genetics	4
FDSC 211 Biochemistry 1	3
FDSC 212 Biochemistry Laboratory	2
MICR 200 Laboratory Methods in Microbiology	3
MICR 230 Microbial World	3
MICR 331 Microbial Ecology	3
MICR 337 Frontiers in Microbiology	1
MICR 338 Bacterial Molecular Genetics	3
MICR 341 Mechanisms of Pathogenicity	3
MICR 442 Food Microbiology and Sanitation	3
MICR 492 Research Project 1	2
MICR 493 Research Project 2	3
MICR 495 Seminar 1	1
MICR 496 Seminar 2	2
PARA 400 Eukaryotic Cells and Viruses	3
PARA 438 Immunology	3
PLNT 201 Comparative Plant Biology	3
ZOOL 424 Parasitology	3

**RESOURCE CONSERVATION MAJOR**

[Program revisions are under consideration for September 2003. Go to [www.mcgill.ca](http://www.mcgill.ca) (Course Calendars) in July for details.]

Academic Adviser: Professor B. Côté

The Major prepares students to deal with problems in integrated resource management and environmental protection with the objective of making optimal use of natural resources under any given set of economic, social and ecological conditions. Students follow a series of required courses and select complementary courses on physical, biological, soil and aquatic resources from approved lists on each of these themes.

**Required Courses:** 25 credits

**Complementary Courses:** 33 credits.

**Electives:** to meet the minimum 90-credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>25</b>
AEBI 205 Principles of Ecology	3
AGEC 200 Principles of Microeconomics	3
AGEC 333 Resource Economics	3
FDSC 211 Biochemistry 1	3
SOIL 200 Introduction to Earth Science	3
SOIL 210 Principles of Soil Science	3
WILD 437 Assessing Environmental Impact	2

WILD 491	Seminar	2
ZOOL 315	Science of Inland Waters	3
<b>Complementary Courses:</b>		<b>min. 33</b>
AEMA 310	(3) Statistical Methods 1	3
or MATH 203 <sup>1</sup>	(3) Principles of Statistics 1	
PLNT 201	(3) Comparative Plant Biology	3
or PLNT 211	(3) Principles of Plant Science	
At least two of the following:		6
ABEN 214	(3) Surveying	
ABEN 217	(3) Hydrology and Drainage	
or GEOG 322 <sup>1</sup>	(3) Environmental Hydrology	
ABEN 416	(3) Engineering for Land Development	
AEPH 201	(3) Introductory Meteorology	
WILD 333	(3) Physical and Biological Aspects of Pollution	
At least three of the following:		9 or 10
AEMA 306	(3) Mathematical Methods in Ecology	
BIOL 465 <sup>1</sup>	(3) Conservation Biology	
MICR 331	(3) Microbial Ecology	
PLNT 358	(3) Flowering Plant Diversity	
SOIL 335	(3) Soil Ecology and Management	
WILD 401	(4) Fisheries and Wildlife Management	
WOOD 410	(3) The Forest Ecosystem	
At least three of the following:		9
AGRI 435	(3) Soil and Water Quality Management	
SOIL 315	(3) Soil Fertility and Fertilizer Use	
SOIL 326	(3) Soil Genesis and Classification	
SOIL 331	(3) Soil Physics	
SOIL 410	(3) Soil Chemistry	
NRSC 521	(3) Soil Microbiology and Biochemistry	
At least one of the following:		3
GEOG 201 <sup>1</sup>	(3) Introductory Geo-Information Science	
ABEN 330	(3) GIS for Biosystems Engineering	
WILD 310	(3) Air Photo and Imagery Interpretation	

<sup>1</sup> Downtown Campus

**Note:** Other courses on the Downtown Campus may be equivalent to some required courses; consult the Academic Adviser. Course substitutions must be approved by the Committee on Academic Standing.

### WILDLIFE BIOLOGY MAJOR

[Program revisions are under consideration for September 2003. Go to [www.mcgill.ca](http://www.mcgill.ca) (Course Calendars) in July for details.]

Academic Advisers: Professors M. Curtis (U1), D. Bird (U2), R. Titman(U3)

This program emphasizes understanding the ecology of vertebrate animals, their biological and physical environment and the interactions that are important in the management of ecological communities and wildlife species. Employment opportunities exist in resource planning, nature interpretation, wildlife management and environmental impact assessment. By careful course selection students may meet requirements for certification by the Wildlife Society.

**Required Courses:** 37 credits.

**Complementary Courses:** 27 credits.

**Electives:** to meet the requirement of 90 credits for the degree.

		<b>CREDITS</b>
<b>Required Courses:</b>		<b>37</b>
AEBI 200	Biology of Organisms	3
AEBI 205	Principles of Ecology	3
AEMA 310	Statistical Methods 1	3
CELL 204	Genetics	4
FDSC 211	Biochemistry 1	3
PLNT 201	Comparative Plant Biology	3
PLNT 358	Flowering Plant Diversity	3

WILD 401	Fisheries and Wildlife Management	4
WILD 410	Wildlife Ecology	3
WILD 491D1	Seminar	1
WILD 491D2	Seminar	1
ZOOL 307	Natural History of Vertebrates	3
ZOOL 312	Zoological Systematics and Evolution	3

### Complementary Courses:

27

9 credits from List A (Organismal Biology)	
BIOL 327	(3) Herpetology
WILD 350	(3) Mammalogy
WILD 420	(3) Ornithology
ZOOL 311	(3) Ethology
ZOOL 424	(3) Parasitology
18 credits from List B (Integration and Applications)	
AEMA 306	(3) Mathematical Methods in Ecology
AGEC 333	(3) Resource Economics
ANSC 323	(4) Mammalian Physiology
BIOL 465	(3) Conservation Biology
NRSC 497D1	(2.5) Project 2
NRSC 497D2	(2.5) Project 2
NUTR 361	(3) Environmental Toxicology
PLNT 460	(3) Plant Ecology
WILD 382	(3) Fish and Wildlife Propagation
WILD 415	(2) Conservation Law
WILD 421	(3) Wildlife Conservation
WILD 437	(3) Assessing Environmental Impact
WILD 475	(3) Desert Ecology
WOOD 410	(3) The Forest Ecosystem
WOOD 441	(3) Integrated Forest Management
ZOOL 313	(3) Zoogeography
ZOOL 315	(3) Science of Inland Waters

## 6.8 Department of Plant Science

Raymond Building – Room R2-019

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

*Chair* — Marc Fortin

*Emeritus Professors* — Ralph H. Estey, William F. Grant, W.E. Sackston, Howard A. Stepler

*Professors* — Deborah J. Buszard, Pierre Dutilleul, Diane E. Mather, Donald L. Smith, Alan K. Watson

*Associate Professors* — Danielle J. Donnelly, Marc Fortin (*William Dawson Scholar*), Suha J.-Hare, Ajiyama C. Kushalappa, Katrine A. Stewart, Marcia J. Waterway

*Assistant Professors* — Jacqueline C. Bede, Sylvie de Blois, Philippe Seguin

*Faculty Lecturers* — Caroline Begg, Serge Lussier, Katherine McClintock, David D. Wees

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

*Adjunct Professors* — Miles R. Bullen, Todd Capson, Sylvie Jenni, Jean-François Laliberté, Louise O'Donoghue

The Department of Plant Science administers Majors in Botanical Science and Plant Science, and participates in administering Majors in Agricultural Sciences and the Environmetrics and Food Production and Environment Domains of the McGill School of Environment. (Full descriptions of these Majors are available at [www.mcgill.ca/plant/undergraduate](http://www.mcgill.ca/plant/undergraduate).) A minimum of 90 credits is needed to complete each Major. It is recommended that students take organic chemistry prior to entering these Majors.

**BOTANICAL SCIENCE MAJOR**

Academic Adviser: Professor D.J. Donnelly  
e-mail: donnelly@nrs.mcgill.ca

The Botanical Science Major offers two options for those interested in working with plants, one emphasizing the ecology of plants and their environment and the other emphasizing the physiology and molecular biology of plants. The Ecology Option emphasizes ecology, conservation, and environmental sciences. The Molecular Option emphasizes molecular genetics, plant improvement, and biotechnology. These two options form botanists prepared for exciting careers in the knowledge economy.

Graduates find employment within private industries, government services, consulting, teaching, or go on to do postgraduate research.

These programs can be completed entirely on the Macdonald Campus or one term can be spent taking courses on the Downtown Campus during the final year.

**Required Courses:** 42 credits.

**Complementary Courses:** 18 credits, selected from an approved list in consultation with the Academic Adviser; taken in either the Ecology or the Molecular Option.

**Electives:** to meet the minimum requirement of 90 credits for the degree.

**Note:** courses marked with an asterisk (\*) are offered on the Downtown Campus.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>42</b>
AEBI 200 Biology of Organisms	3
AEBI 202 Cellular Biology	3
AEBI 205 Principles of Ecology	3
AEMA 310 Statistical Methods 1	3
CELL 204 Genetics	4
FDSC 211 Biochemistry 1	3
PLNT 201 Comparative Plant Biology	3
PLNT 220 Introduction to Vascular Plants	1
PLNT 221 Introduction to Fungi	1
PLNT 353 Plant Structure and Function	4
PLNT 358 Flowering Plant Diversity	3
PLNT 458 Flowering Plant Systematics	3
PLNT 460 Plant Ecology	3
PLNT 489 Project Planning and Proposal	1
PLNT 490 Research Project	2
PLNT 495 Seminar 1	1
PLNT 496 Seminar 2	1

**Complementary Courses** 18  
Either the Ecology Option or the Molecular Option

**Ecology Option:** 18

at least 12 credits must be chosen from the following:

AEMA 306 (3) Mathematical Methods in Ecology	
AGRI 340 (3) Principles of Ecological Agriculture	
*BIOL 324 (3) Ecological Genetics	
*BIOL 331 (3) Ecology/Behaviour Field Course	
*BIOL 334 (3) Applied Tropical Ecology	
*BIOL 465 (3) Conservation Biology	
*BIOL 483 (3) Stat. Approaches in Ecology and Evolution	
*GEOG 350 (3) Ecological Biogeography	
MICR 331 (3) Microbial Ecology	
WILD 415 (2) Conservation Law	
WILD 437 (3) Assessing Environmental Impact	
WOOD 410 (3) The Forest Ecosystem	
WOOD 420 (3) Environmental Issues: Forestry	
ZOOL 315 (3) Science of Inland Waters	

the remaining credits, if any, to be chosen from the Molecular Option or the General Complementary Course lists.

**Molecular Option:**

18

at least 12 credits must be chosen from the following:

AEBI 306 (3) Biological Instrumentation	
*BIOL 301 (4) Laboratory in Molecular and Cellular Biology	
*BIOL 303 (3) Developmental Biology	
*BIOL 333 (3) Plant Biotechnology	
BTEC 501 (3) Bioinformatics	
CELL 500 (3) Techniques Plant Molecular Genetics	
CELL 501 (3) Plant Molecular Biology and Genetics	
FDSC 212 (2) Biochemistry Laboratory	
MICR 200 (3) Laboratory Methods in Microbiology	
MICR 230 (3) Microbial World	
MICR 338 (3) Bacterial Molecular Genetics	
PARA 400 (3) Eukaryotic Cells and Viruses	
PLNT 525 (3) Advanced Micropropagation	
PLNT 535 (3) Plant Breeding	

the remaining credits, if any, to be chosen from the Ecology Option or the General Complementary Course lists.

**General Complementary Courses:**

*BIOL 555 (3) Functional Ecology of Trees	
NUTR 512 (3) Herbs, Foods and Phytochemicals	
PLNT 215 (1) Orientation in Plant Science	
PLNT 304 (3) Biology of Fungi	
PLNT 305 (3) Plant Pathology	
PLNT 310 (3) Plant Propagation	
PLNT 434 (3) Weed Biology and Control	
PLNT 450 (2) Special Topics: Plant Science	
PLNT 451 (3) Special Topics: Plant Science 2	
SOIL 210 (3) Principles of Soil Science	

**PLANT SCIENCE MAJOR**

Academic Adviser: Professor P. Seguin  
e-mail: philippe.seguin@mcgill.ca

The Plant Science Major offers intensive training in agricultural plant science. Comprehensive studies are offered in all aspects of biology and production practices related to important crop plant species. Studies include laboratory, greenhouse, and field exposure relating to agronomic, horticultural, or field crop development, production and management.

Graduates are eligible to apply for membership in l'Ordre des agronomes du Québec (OAQ) and the Agricultural Institute of Canada (AIC). Graduates rapidly find employment in agricultural industries, government services, extension, consulting, teaching, or go on to do postgraduate research.

**Required Courses:** 49 credits

**Complementary Courses:** 18 credits.

**Electives:** Chosen in consultation with the Academic Adviser, to meet the minimum 90 credit requirement for the degree.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>49</b>
AEMA 310 Statistical Methods 1	3
AGEC 200 Principles of Microeconomics	3
ANSC 250 Principles of Animal Science	3
CELL 204 Genetics	4
FDSC 211 Biochemistry 1	3
MICR 230 Microbial World	3
PLNT 211 Principles of Plant Science	3
PLNT 300 Cropping Systems	3
PLNT 305 Plant Pathology	3
PLNT 310 Plant Propagation	3
PLNT 353 Plant Structure and Function	4
PLNT 358 Flowering Plant Diversity	3
PLNT 434 Weed Biology and Control	3
PLNT 495 Seminar 1	1
PLNT 496 Seminar 2	1
SOIL 210 Principles of Soil Science	3
SOIL 315 Soil Fertility and Fertilizer Use	3



**Complementary Courses:**

18

at least one of:

- ABEN 300 (3) Elements of Agricultural Engineering  
 ENTO 452 (3) Control of Insect Pests

A minimum of 3 credits selected from the following list:

- AGECE 231 (3) Economic Systems of Agriculture  
 AGECE 320 (3) Economics of Agricultural Production  
 AGECE 331 (3) Farm Business Management  
 AGECE 350 (3) Agricultural Finance

plus a minimum of 12 credits selected from the course list given below:

- FDSC 310 (3) Post Harvest Fruit and Vegetable Technology  
 PLNT 215 (1) Orientation in Plant Science  
 PLNT 220 (1) Introduction to Vascular Plants  
 PLNT 221 (1) Introduction to Fungi  
 PLNT 322 (3) Greenhouse Management  
 PLNT 331 (3) Field Crops  
 PLNT 341 (1) Horticulture - The Alliums  
 PLNT 342 (1) Horticulture - Cole Crops  
 PLNT 343 (1) Horticulture - Root Crops  
 PLNT 344 (1) Horticulture - Salad Crops  
 PLNT 345 (1) Horticulture - Solanaceous Crops  
 PLNT 346 (1) Horticulture - Temperate Fruits  
 PLNT 347 (1) Horticulture - Small Fruits  
 PLNT 348 (1) The Brassicas  
 PLNT 421 (3) Landscape Plant Materials  
 PLNT 460 (3) Plant Ecology  
 PLNT 535 (3) Plant Breeding

**MINOR IN AGRICULTURAL PRODUCTION**

Academic Adviser: Professor K. A. Stewart  
 e-mail: [stewartk@macdonald.mcgill.ca](mailto:stewartk@macdonald.mcgill.ca)

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 in 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.

**General Regulations**

To obtain a Minor in Agricultural Production, 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:** 12 credits

**Complementary Courses:** 12 credits.

	<b>CREDITS</b>
<b>Required Courses:</b>	<b>12</b>
ANSC 250 Principles of Animal Science	3
PLNT 211 Principles of Plant Science	3
PLNT 300 Cropping Systems	3
SOIL 210 Principles of Soil Science	3

**Complementary Courses:**

12

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

- ANSC 450 (3) Dairy Cattle Production  
 ANSC 452 (3) Beef Cattle and Sheep Production  
 ANSC 454 (3) Swine Production  
 ANSC 456 (3) Poultry Production  
 PLNT 331 (3) Field Crops  
 PLNT 341 (1) Horticulture - The Alliums  
 PLNT 342 (1) Horticulture - Cole Crops  
 PLNT 343 (1) Horticulture - Root Crops  
 PLNT 344 (1) Horticulture - Salad Crops  
 PLNT 345 (1) Horticulture - Solanaceous Crops  
 PLNT 346 (1) Horticulture - Temperate Fruits  
 PLNT 347 (1) Horticulture - Small Fruits  
 PLNT 348 (1) The Brassicas

**Notes:**

- 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.
- Not all courses are offered every year. For information on available courses, consult Class Schedule at [www.mcgill.ca/minerva](http://www.mcgill.ca/minerva); complete listings can be found in the Courses section of this Calendar.

## 7 Graduate Programs

Graduate work may be undertaken on the Macdonald Campus, through the Departments of Agricultural and Biosystems Engineering, Agricultural Economics, Animal Science, Food Science and Agricultural Chemistry, Natural Resource Sciences, and Plant Science; the Institute of Parasitology; and the School of Dietetics and Human Nutrition.

The advanced courses of study offered lead to the degrees of Master of Science, Graduate Certificate in Biotechnology, and Doctor of Philosophy.

Information on these programs and related fellowships is available from the Student Affairs Office, Macdonald Campus of McGill University, Sainte-Anne-de-Bellevue, QC H9X 3V9.

The *Graduate and Postdoctoral Studies Calendar* and full information regarding graduate courses, theses, registration, fellowships, etc. can be accessed on the McGill Website [www.mcgill.ca](http://www.mcgill.ca).

## 8 Farm Management and Technology Program

Farm Management and Technology Program  
 Faculty of Agricultural and Environmental Sciences  
 P.O. Box 204, Macdonald Campus of McGill  
 21,111 Lakeshore Road  
 Sainte-Anne-de-Bellevue, Quebec, H9X 3V9

Telephone: (514) 398-7814 Fax: (514) 398-7955  
 E-mail: [fmt@macdonald.mcgill.ca](mailto:fmt@macdonald.mcgill.ca)  
 Website: [www.mcgill.ca/fmt](http://www.mcgill.ca/fmt)

**Director - Marcel J. Couture**

### 8.1 Program – FMT

The Farm Management and Technology (FMT) program is a three (3) year academic and practical program 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 Québec.

The educational goals of the program are:

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

Six academic terms are spent on the Macdonald Campus studying a sequence of courses in soil, plant science, animal science, engineering, economics and management. The first summer of the program is spent on a farm other than the home farm where the student learns the many skills and encounters the many problems related to modern commercial agriculture. Students will prepare for this 13-week practicum through a one-week internship during both academic semesters of Year 1.

During the second summer, students will be encouraged to acquire additional farm experience away from the home farm. This could be a farm enterprise or another field of activities in the agri-food sector. Students could also choose to spend their second summer on their home farm, where they would be responsible for data collection to be used in their Farm Project and the Agro-Environmental Fertilization Plan. The internships and practicums will enable the students to relate their academic work to the reality of farming.

Finally, courses in English, French, Humanities, Physical Education and two complementary courses taken during the program will entitle the student to receive a Diplôme d'études collégiales (DEC) from the ministère de l'Éducation du Québec. Students will also receive a certification from Macdonald Campus stating that they have successfully completed the requirements of the Farm Management and Technology Program.

**Note:** Admission to this program is only in the Fall semester.

## 8.2 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.Q.
3. All candidates for admission must make arrangements to come to the Macdonald Campus for an interview prior to admission to the program.

Although not it is not an entrance requirement, incoming students are strongly encouraged to acquire their driver's permit (for cars **and** for farm equipment) before coming to Macdonald Campus. This is both for safety reasons, given that students begin working with farm equipment very early in the program, and because most farmers require that their employees and stagiaires know how to drive both passenger vehicles and farm equipment and possess an appropriate driver's license.

## 8.3 Registration – FMT

Students in the Farm Management and Technology Program must register on-line using Minerva at [www.mcgill.ca/minerva](http://www.mcgill.ca/minerva) for each semester at McGill. They do not, however, register their individual courses within the McGill system because their marks and student records are handled through the M.E.Q. data base. FMT students register in one "global registration" course each term as follows:

### Full-time students (four or more individual courses)

Semester	Description	Course number
Fall 1	Global Registration 1	AGRI D33
Winter 1	Global Registration 2	AGRI D34
Fall 2	Global Registration 3	AGRI D35
Winter 2	Global Registration 4	AGRI D36
Fall 3	Global Registration 5	AGRI D37
Winter 3	Global Registration 6	AGRI D38

### Part-time students (three individual courses or less)

Semester	Description	Course number
Fall 1	Global Registration 7	AGRI D14
Winter 1	Global Registration 8	AGRI D15
Fall 2	Global Registration 9	AGRI D16
Winter 2	Global Registration 10	AGRI D17
Fall 3	Global Registration 11	AGRI D18
Winter 3	Global Registration 12	AGRI D19

**Note:** In normal circumstances, individual (non-global registration) FMT courses will not be offered with less than five registrants.

## 8.4 Program Outline

### Administrative Unit

Farm Practice 1  
 Farm Practice 2  
 Farm Practice 3  
 Health and Farm Safety

### Agricultural and Biosystems Engineering

Building Maintenance  
 Farm Building Planning  
 Machinery Management  
 Microcomputing  
 Precision Farming  
 Soil and Water Conservation  
 Soil Preparation  
 Tools and Machinery Maintenance

### Agricultural Economics

Agricultural Marketing  
 Introduction to Economics  
 Farm Business Management 1  
 Farm Business Management 2  
 Farm Business Management 3  
 Farm Project  
 Management of Human Resources

### Animal Science

Animal Anatomy and Physiology  
 Introduction to Animal Science

### English

English Upgrading  
 English for FMT  
 Components of Discourse  
 Literary Genres  
 Literary Themes

### French

Langue française et communication  
 French 2

### Humanities

Humanities 1: Knowledge  
 Humanities 2: World Views  
 Environmental and Organizational Issues

### Natural Resource Sciences

Agro-Environmental Fertilization Plan 1  
 Agro-Environmental Fertilization Plan 2  
 Soil Fertilization

### Physical Education

Health and Physical Education  
 Physical Activity  
 Active Living

### Plant Science

Agricultural Botany  
 Pesticide Use

## ELECTIVE PRODUCTION COURSES

Four production courses are offered 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 advisor. They must take a minimum of two courses per semester.

### Animal Science category

Dairy Heifer Management  
Dairy Herd Management  
Swine and Poultry  
Beef and Sheep

### Plant Science category

Feed Crops  
Industrial Crops  
Greenhouse Crops  
Fruit and Vegetable Crops

### COMPLEMENTARY COURSES \*

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

Forests, Forestry and Society  
Landscape Design

\* After consultation with their academic advisor, students can substitute complementary courses taken at another collegial institution.

### COMPREHENSIVE ASSESSMENT

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

The passing grade will be 60%. The mark stating that the student has successfully completed the Comprehensive Assessment will appear on the student's transcript. The student who failed the comprehensive assessment will be offered the possibility of another try the following year.

### 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.Q. Students must take this examination on the date selected by M.E.Q.

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## 8.5 Academic Rules and Regulations – FMT

### 8.5.1 Sessional Dates

The number of teaching and examination days is set by the ministère de l'Éducation du Québec. The sessional dates vary from year to year. At the present time, each semester has 75 teaching days and 7 days of exams.

### 8.5.2 Last day for withdrawal or course additions

The last day to make course registration changes for Fall term courses will be September 20.

The last day to make course registration changes for Winter term courses will be February 15.

### 8.5.3 Academic Standing

Attendance in class is compulsory. Students with an attendance of less than 80% may not be permitted to write examinations.

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

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

Students on probation are normally permitted to register for not more than 10 credits per semester. They are not permitted to be on probation for more than one semester unless they obtain a SPA of 70% or higher.

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

### 8.5.4 Handbook on Students Rights and Responsibilities

This Handbook is a compendium of regulations and policies governing student rights and responsibilities at McGill University. It is published jointly by the Dean of Students' Office and the Secretariat. Copies of the Handbook are available in the Library and students are informed of it at registration time.

### 8.5.5 Institutional Policy on the Evaluation of Student Achievement

The policy has the following objectives:

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

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

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## 8.6 Fees and Expenses – FMT

### 8.6.1 Fees

Tuition fees for all full-time students who are eligible for the Farm Management and Technology Program are paid by the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec. Student Services and Student Societies' fees, as well as course material fees will be charged according to the schedule in effect for all Macdonald Campus students. At the time of printing, the fees were \$592.40\* per semester (charged twice a year).

\* 2002-03 fees, subject to change without notice.

### 8.6.2 Textbooks and Supplies

The cost of textbooks and supplies is estimated at \$200.00 per semester.

### 8.6.3 Financial Assistance

A limited number of loans are granted on the basis of financial need to full-time students who maintain satisfactory academic standing, however, all applicants for McGill aid must apply for maximum government aid or other assistance for which they are eligible.

Applicants must arrange for an interview with a Student Aid Counsellor. During the academic year, the Counsellor visits Macdonald Campus on a regular basis to help students with financial difficulties.

For more information see "Financial Aid" on page 13 or contact the Coordinator at the Student Services Centre, telephone (514) 398-7992. Applications for McGill loans may be obtained from the Coordinator.

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## 8.7 Residence Accommodation – FMT

The Laird Hall Residence has a capacity for more than 210 students. It accommodates undergraduate, graduate, and Farm Management and Technology Program students on the Macdonald Campus. For more information, see "University Residences – Macdonald Campus" on page 42.

## 9 Instructional Staff

- Alli, Inteaz; B.Sc.(Guyana), M.Sc., Ph.D.(McG.); Professor of Food Science and Agricultural Chemistry
- Baker, Laurence; B.B., M.Sc.(Man.), Ph.D.(McG.); Associate Professor of Agricultural Economics
- Barrington, Suzelle; B.Sc.(Agr.Eng.), Ph.D.(McG.); Professor of Agricultural and Biosystems Engineering
- Bede, Jacqueline; B.Sc.(Calg.), M.Sc., Ph.D.(Tor.); Assistant Professor of Plant Science
- Beech, Robin N.; B.Sc.(Nottingham), Ph.D.(Edinburgh); Associate Professor of Parasitology
- Begg, Caroline; B.Sc.(Agr.)(McG.), M.Sc.(Sask.), Ph.D.(McG.); Faculty Lecturer, Department of Plant Science
- Berteaux, Dominique; B.Sc.(Rennes), M.Sc.(Tours), Ph.D.(Sherbrooke); Adjunct Professor of Wildlife Biology
- Bird, David M.; B.Sc.(Guelph), M.Sc., Ph.D.(McG.); Fellow A.O.U.; Professor of Wildlife Biology and Director, Avian Science and Conservation Centre
- Blackwood, A. Clark; B.Sc., M.Sc.(Alta.), Ph.D.(Wis.), F.R.S.C.; Emeritus Professor of Microbiology
- Bonnell, Robert B.; B.Sc.(C'dia), B.Sc.(Agr.Eng.), M.Sc., Ph.D.(McG.); Associate Professor of Agricultural and Biosystems Engineering (*Brace Associate Professor*)
- Bordignon, Vilceu; Ag.Tec.(EAPC), D.V.M., M.Sc., Ph.D.; Assistant Professor of Animal Science
- Broughton, Robert S.; B.S.A., B.A.Sc.(Tor.), S.M.(M.I.T.), Ph.D.(McG.), L.L.D.(Dal.); F.A.S.A.E., F.C.S.A.E.; Emeritus Professor of Agricultural and Biosystems Engineering
- Brown, Peter G.; B.A.(Haverford), M.A., Ph.D.(Columbia); Professor of Natural Resource Sciences (*joint appoint. with Geography and McGill School of Environment*)
- Buckland, Roger B.; B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(Maryland); Professor of Animal Science
- Buddle, Christopher; B.Sc.(Guelph), Ph.D.(Alta.); Assistant Professor of Forest Insect Ecology
- Buszard, Deborah J.I.; B.Sc.(Bath), Ph.D.(Lond.); Dean and Professor of Horticulture
- Chadee, Khrisendath; B.Sc.(Wpg.), M.Sc.(Manit.), Ph.D.(McG.); Associate Professor of Parasitology
- Chan, Laurie H.M.; B.Sc., M.Phil.(Hong Kong), Ph.D.(London); Associate Professor of Dietetics and Human Nutrition (*NSERC Northern Research Chair*)
- Chavez, Eduardo R.; Agr.Eng.(Chile), M.Sc., Ph.D.(Calif.); Professor of Animal Science
- Côté, Benoît; B.Sc., Ph.D.(Laval); Associate Professor of Woodland Resources, Chair of Natural Resource Sciences
- Couture, Marcel J.; B.Sc.(Agr.)(McG.), M.Sc.(Guelph); Associate Dean (Community Relations), Faculty Lecturer of Agricultural Economics, and Director, Farm Management and Technology Program
- Cue, Roger I.; B.Sc.(Newcastle-upon-Tyne), Ph.D.(Edin.); Associate Professor of Animal Science
- Curtis, Mark; B.Sc., M.Sc., Ph.D.(McG.); Associate Professor of Wildlife Biology
- de Blois, Sylvie; B.Sc.(Agr.)(McG.), M.Sc., Ph.D.(Montr.), Assistant Professor of Nutrition and McGill School of Environment
- Donnelly, Danielle J.; B.Sc.(Agr.)(McG.), M.Sc.(U.B.C.), Ph.D.(S. Fraser); Associate Professor of Plant Science
- Downey, Bruce R.; D.V.M.(Tor.), Ph.D.(McG.); Professor of Animal Science; Director, Bellairs Research Centre
- Driscoll, Brian T.; B.Sc., Ph.D.(McMaster); Associate Professor of Microbiology
- Dunphy, Gary B.; B.Sc.(U.N.B.), M.Sc., Ph.D.(Mem.); Associate Professor of Entomology
- Dutilleul, Pierre R.; B.Sc., Ph.D.(Belgium); Professor of Statistics
- Egeland, Grace M.; B.A.(Luther), Ph.D.(Pittsburg); Associate Professor of Nutrition and Canada Research Council Chair
- Ellyett, William R.; B.A.(Sir G. Wms.), B.Ed.(P.E.)(McG.); Faculty Lecturer, Farm Management and Technology Program and Director of Athletics
- Enright, Peter; B.Sc.(Agr. Eng.), M.Sc.(McG.); Faculty Lecturer, Agricultural and Biosystems Engineering
- Estey, Ralph H.; B.Ed.(U.N.B.), M.S.(Maine), D.I.C.(Imp. Coll.), B.Sc.(Agr.), Ph.D.(McG.), F.L.S.; Emeritus Professor of Plant Pathology
- Faubert, Gaétan M.; B.Sc.(Sherbrooke), M.Sc.(Mtl.), Ph.D.(McG.); Professor of Parasitology
- Fortin, Marc G.; B.Sc., M.Sc.(Laval), Ph.D.(McG.); Associate Professor of Plant Science and Chair of Department (*William Dawson Scholar*)
- Fyles, James W.; B.Sc., M.Sc.(Vict.), Ph.D.(Alta.); Professor of Woodland Resources (*Tomlinson-Fowler Professor of Forest Ecology*)
- Georges, Elias; B.Sc., Ph.D.(McG.); Associate Professor of Parasitology
- Gougeon, Rejeanne; B.Sc.(Laval), M.Sc.(Col.), Ph.D.(Montr.); Assistant Professor (PT) of Dietetics and Human Nutrition
- Grant, William F.; B.A., M.A.(McM.), Ph.D.(Virginia), F.L.S.; Emeritus Professor of Genetics
- Gray-Donald, Katherine; B.Sc., Ph.D.(McG.); Associate Professor and Director of School of Dietetics and Human Nutrition
- Gunjal, Kisan R.; B.Sc.(Poona), M.Sc.(New Delhi), Ph.D.(Iowa St.); Associate Professor of Agricultural Economics
- Hayes, J. Flannan; B.Agr.Sc., M.Agr.Sc.(Dub.), Ph.D.(N.C.St.); Professor of Animal Science, Acting Chair of Animal Science
- Hendershot, William H.; B.Sc.(Tor.), M.Sc.(McG.), Ph.D.(U.B.C.); Associate Dean (Academic), Professor of Soil Science
- Henning, John C.; B.Sc., Ph.D.(Guelph); Associate Professor of Agricultural Economics, Chair of Agricultural Economics
- Humphries, Murray; B.Sc.(Manit.), Ph.D.(Alta.); Assistant Professor of Wildlife Biology
- Ismail, Ashraf A.; B.Sc., Ph.D.(McG.); Associate Professor of Food Science and Agricultural Chemistry
- Jabaji-Hare, Suha; B.Sc.(AUB), M.Sc.(Guelph), Ph.D.(Waterloo); Associate Professor of Plant Science
- 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.(U.Vic.); Assistant Professor of Parasitology
- Johns, Timothy A.; B.Sc.(McM.), M.Sc.(U.B.C.), Ph.D.(Mich.); Professor of Dietetics and Human Nutrition
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- Kermasha, Selim; B.Sc.(Baghdad), D.Sc.(Nat. Polytech.Inst., Lorraine(Nancy)); Associate Professor of Food Science and Agricultural Chemistry
- Knowles, Roger; B.Sc.(Birm.), Ph.D., D.Sc.(Lond.), F.R.S.C.; Emeritus Professor of Microbiology
- Kok, Robert; B.E.Sc., Ph.D.(W.Ont.); Professor of Agricultural and Biosystems Engineering
- Koski, Kristine G.; B.S., M.S.(Wash) Ph.D.(Calif., Davis); Associate Professor of Dietetics and Human Nutrition
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- Kuhnlein, Urs; B.Sc.(Fed. Inst. of Tech., Zurich), Ph.D.(Geneva); Professor of Animal Science
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- Madramootoo, Chandra; B.Sc.(Agr.Eng.), M.Sc., Ph.D.(McG.); Professor of Agricultural and Biosystems Engineering and Director, Brace Centre for Water Resources Management (*James McGill Professor*)
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- Mustafa, Arif F.; B.Sc., M.Sc.(Khartoum), Ph.D.(Sask.); Assistant Professor of Animal Science
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- Niven, Donald F.; B.Sc., Ph.D.(Aber.); Associate Professor of Microbiology
- Norris, Eric R.; B.S.A.(Tor.), M.Sc.(Guelph), Ph.D.(Mich. St.); F.C.S.A.E.; Associate Dean (Student Affairs) and Associate Professor of Agricultural and Biosystems Engineering
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- Raghavan, G.S. Vijaya; B.Eng.(Bangalore), M.Sc.(Guelph), Ph.D.(Colo.St.); F.A.S.A.E., F.C.S.A.E., F.A.S.M.E. (*James McGill Professor*); Professor of Agricultural and Biosystems Engineering and Chair of Department
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- Simpson, Benjamin K.; B.Sc.(Univ. Sc. & Tech., Kumasi), Ph.D.(Memorial); Associate Professor of Food Science and Agricultural Chemistry
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- Smith, James P.; B.Sc., M.Sc.(Strathclyde), Ph.D.(Alta.); Professor of Food Science and Agricultural Chemistry
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- Spithill, Terence W.; B.Sc., Ph.D.(Monash U., Australia); Professor of Parasitology, Director Institute of Parasitology and Canada Research Council Chair
- Steppler, Howard A.; B.S.A.(Man.), M.Sc., Ph.D.(McG.), F.A.I.C.; Emeritus Professor of Agronomy
- Stevenson, Mary M.; B.A.(Hood College), M.S., Ph.D.(Catholic University of America); Associate Member (PT), Institute of Parasitology
- Stewart, Katrine A.; B.Sc.(Agr.)(U.B.C.), Ph.D.(Reading); Associate Professor of Horticulture
- Stewart, Robin K.; B.Sc.(Agr.), Ph.D.(Glas.); Emeritus Professor of Entomology
- Strachan, Ian; B.Sc.(Tor.), M.Sc., Ph.D.(Queen's); Assistant Professor of Agrometeorology
- 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); Associate Professor of Agricultural Economics
- Titman, Rodger D.; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(U.N.B.); Fellow A.O.U., Associate Professor of Wildlife Biology and Associate Director, Avian Science and Conservation Centre
- van de Voort, Frederik R.; B.Sc., M.Sc., Ph.D.(U.B.C.); Professor of Food Science and Agricultural Chemistry
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