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

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
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 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.

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 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
  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 Internationale Baccalauréate, French Baccalauréate, Advanced Placement Tests, or Advanced Level Examinations.

Applications can be submitted on-line at www.mcgill.ca/ applying. Please note that the same application is used for all undergraduate programs at McGill and two program choices can be entered.

For 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
  Website: 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/studentservices and the Student Services Website 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, or e-mail: 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 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. Agrologists, 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.

<table>
<thead>
<tr>
<th>Required Courses - Fall</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEBI 120 - General Biology</td>
<td>3.0</td>
</tr>
<tr>
<td>AEMA 101 - Calculus 1</td>
<td>3.0</td>
</tr>
<tr>
<td>AEPH 112 - Introductory Physics 1</td>
<td>4.0</td>
</tr>
<tr>
<td>AGRI 195* - Freshman Seminar 1</td>
<td>0.5</td>
</tr>
<tr>
<td>FDSC 230 - Organic Chemistry</td>
<td>4.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Required Courses - Winter</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEMA 102 - Calculus 2</td>
<td>4.0</td>
</tr>
<tr>
<td>AEPH 114 - Introductory Physics 2</td>
<td>4.0</td>
</tr>
<tr>
<td>AGRI 196* - Freshman Seminar 2</td>
<td>0.5</td>
</tr>
<tr>
<td>FDSC 110 - Inorganic Chemistry</td>
<td>4.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elective - Winter</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective</td>
<td>3.0</td>
</tr>
<tr>
<td>AEBI 202 - Cellular Biology</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Credit: ABEN 103 Linear Algebra must be substituted for AEBI 202, and AEBI 202 Cellular Biology must be substituted for ABEN 103 Linear Algebra.

| Total Credits | 30.0 |

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

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

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
1. 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.

2. Students in Probationary standing may register for no more than 14 credits per term.

3. 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).

4. 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).

5. 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 Proba-
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.

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
Website: 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
### 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)

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

### 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.Eng.) program. 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
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.

**Core Required Courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABEN 252</td>
<td>Structured Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>ABEN 314</td>
<td>Agricultural Structures</td>
<td>3</td>
</tr>
<tr>
<td>ABEN 324</td>
<td>Elements of Food Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ABEN 412</td>
<td>Agricultural Machinery</td>
<td>3</td>
</tr>
</tbody>
</table>

**Complementary Courses:**

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABEN 411</td>
<td>Off-Road Power Machinery</td>
<td>3</td>
</tr>
<tr>
<td>ABEN 413</td>
<td>Materials Handling Systems</td>
<td>3</td>
</tr>
<tr>
<td>ABEN 416</td>
<td>Engineering for Land Development</td>
<td>3</td>
</tr>
<tr>
<td>ABEN 418</td>
<td>Soil Mechanics and Foundations</td>
<td>3</td>
</tr>
<tr>
<td>ABEN 500</td>
<td>Advanced Applications: Computing in Agriculture</td>
<td>3</td>
</tr>
</tbody>
</table>

**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; complete listings can be found in the Courses section of this Calendar.

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**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 among 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 Required Courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE 200</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>AGE 201</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>AGE 230</td>
<td>Agricultural and Food Marketing</td>
<td>3</td>
</tr>
<tr>
<td>AGE 231</td>
<td>Economic Systems of Agriculture</td>
<td>3</td>
</tr>
<tr>
<td>AGE 242</td>
<td>Management Theories and Practices</td>
<td>3</td>
</tr>
<tr>
<td>AGE 320</td>
<td>Economics of Agricultural Production</td>
<td>3</td>
</tr>
<tr>
<td>AGE 333</td>
<td>Resource Economics</td>
<td>3</td>
</tr>
<tr>
<td>AGE 343</td>
<td>Accounting and Cost Control</td>
<td>3</td>
</tr>
<tr>
<td>AGE 425</td>
<td>Agricultural Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>AGE 430</td>
<td>Agriculture, Food and Resource Policy</td>
<td>3</td>
</tr>
<tr>
<td>AGE 440</td>
<td>Advanced Agriculture and Food Marketing</td>
<td>3</td>
</tr>
<tr>
<td>AGE 442</td>
<td>Economics of International Agricultural Development</td>
<td>3</td>
</tr>
<tr>
<td>AGE 491</td>
<td>Research Seminar in Agricultural Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

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**Option Required and Complementary Courses:** 9 credits.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE 333</td>
<td>Farm Business Management</td>
<td>3</td>
</tr>
<tr>
<td>AGE 350</td>
<td>Agricultural Finance</td>
<td>3</td>
</tr>
<tr>
<td>AGE 450</td>
<td>Agriculture Business Management</td>
<td>3</td>
</tr>
<tr>
<td>AGE 453</td>
<td>Venture Capital Opportunities</td>
<td>3</td>
</tr>
</tbody>
</table>

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**Option Required Courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 311</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 313</td>
<td>Management Accounting</td>
<td>3</td>
</tr>
<tr>
<td>AGE 344</td>
<td>Entrepreneurial Leadership</td>
<td>3</td>
</tr>
<tr>
<td>BUSA 364</td>
<td>Business Law</td>
<td>3</td>
</tr>
<tr>
<td>FINE 448</td>
<td>Derivatives and Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>MGCR 341</td>
<td>Finance</td>
<td>3</td>
</tr>
<tr>
<td>MGCR 382</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 451</td>
<td>Marketing Research</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 446</td>
<td>Applied Human Resources</td>
<td>3</td>
</tr>
</tbody>
</table>

---

**Option Complementary Courses:**

9 credits chosen from the following list:

9 credits.

---

**Agricultural Economics Major**

6.2 **Department of Agricultural Economics**

Raymond Building – Room R3-019

Chair — John C. Henning

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

Lecturers — Joan Marshall, Robert Oxley

Raymond Building – Room R3-019

Website: www.agrenv.mcgill.ca/agrecon

John C. Henning

Laurence Baker, Kisan R. Gunjal, John C. Henning, Paul Thomassin

Joan Marshall, Robert Oxley

Chair — John C. Henning

Website: www.agrenv.mcgill.ca/agrecon
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.

CREDITS

Option Required Courses: 12
AGEC 331 Farm Business Management 3
AGEC 350 Agricultural Finance 3
AGEC 450 Agriculture Business Management 3
AGRI 340 Principles of Ecological Agriculture 3

Option Complementary Courses: 9
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.

CREDITS

Option Required Courses: 12
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

Option Complementary Courses: 9
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

CREDITS

Required Courses 12
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

Complementary Courses 12
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

Required Courses: 27 credits
CREDITS
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
NUTR 446 Applied Human Resources 3

Complementary Course: 3 credits
one of the following courses:
ENV 201 (3) Society and Environment
ENV 203 (3) Knowledge, Ethics and Environment
RELG 270 (3) Religious Ethics and the Environment

63 credits.

6.3 Department of Animal Science
Macdonald Stewart Building - Room MS1-084
Telephone: (514) 398-7794
E-mail: animal.science@mcgill.ca
Website: 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 livestock 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.

Required Courses:
CREDITS
63
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:
CREDITS
6
One Ethics course:
ENV 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-secondary 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.

**CREDITS**

**Required Courses:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEBI 202</td>
<td>Cellular Biology</td>
<td>3</td>
</tr>
<tr>
<td>AEMA 310</td>
<td>Statistical Methods 1</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 234</td>
<td>Biochemistry 2</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 250</td>
<td>Principles of Animal Science</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 251</td>
<td>Comparative Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 323</td>
<td>Mammalian Physiology</td>
<td>4</td>
</tr>
<tr>
<td>ANSC 330</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 495D1 Seminar</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>ANSC 495D2 Seminar</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>CELL 204</td>
<td>Genetics</td>
<td>4</td>
</tr>
<tr>
<td>FDSC 211</td>
<td>Biochemistry 1</td>
<td>3</td>
</tr>
<tr>
<td>MIRC 230</td>
<td>Microbial World</td>
<td>3</td>
</tr>
</tbody>
</table>

**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
- MIRC 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

Website: 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 Canada 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 Yafe

**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 professionnel 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.

**CREDITS**

**Term 1**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>AGEC 242</td>
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<tr>
<td>FDSC 211</td>
<td>Biochemistry 1</td>
<td>3</td>
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<td>NUTR 207</td>
<td>Nutrition and Health</td>
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<td>NUTR 214</td>
<td>Food Fundamentals</td>
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**Term 2**

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>ABEN 251</td>
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<td>ANSC 234</td>
<td>Biochemistry 2</td>
<td>3</td>
</tr>
<tr>
<td>MIRC 230</td>
<td>Microbial World</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 208*</td>
<td>Stage in Dietetics 1</td>
<td>1</td>
</tr>
<tr>
<td>NUTR 217</td>
<td>Application: Food Fundamentals</td>
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**Summer**

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**Term 3**

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<th>Course</th>
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<tbody>
<tr>
<td>AEMA 310</td>
<td>Statistical Methods 1</td>
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</tr>
<tr>
<td>AGEC 343</td>
<td>Accounting and Cost Control</td>
<td>3</td>
</tr>
<tr>
<td>ANSC 323</td>
<td>Mammalian Physiology</td>
<td>4</td>
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<tr>
<td>ANSC 330</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 322</td>
<td>Applied Sciences Communications</td>
<td>2</td>
</tr>
<tr>
<td>NUTR 345</td>
<td>Food Service Systems Management</td>
<td>2</td>
</tr>
</tbody>
</table>
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.

**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.

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**Term 4**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ANSC 424</td>
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<tr>
<td>NUTR 310*</td>
<td>Stage in Dietetics 2A</td>
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<td>NUTR 337</td>
<td>Nutrition Through Life</td>
<td>3</td>
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<tr>
<td>NUTR 344</td>
<td>Clinical Nutrition</td>
<td>4</td>
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<tr>
<td>NUTR 346</td>
<td>Quantity Food Production</td>
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**Summer**

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**Term 5**

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<tbody>
<tr>
<td>NUTR 403</td>
<td>Nutrition in Society</td>
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<tr>
<td>NUTR 445</td>
<td>Clinical Nutrition 2</td>
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<tr>
<td>NUTR 446</td>
<td>Applied Human Resources</td>
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<tr>
<td>NUTR 450</td>
<td>Research Methods: Human Nutrition</td>
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**Term 6**

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<tr>
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<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NUTR 409*</td>
<td>Stage in Dietetics 3</td>
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<td>NUTR 436</td>
<td>Nutritional Assessment</td>
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<tr>
<td>NUTR 438</td>
<td>Interviewing and Counselling</td>
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**Term 7**

<table>
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<tr>
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<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>NUTR 410*</td>
<td>Professional Practice - Stage 4</td>
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</table>

**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
  - ENV 202 (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.

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**Term 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>FDSC 211</td>
<td>Biochemistry 1</td>
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<td>FDSC 212</td>
<td>Biochemistry Laboratory</td>
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<td>NUTR 207</td>
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<td>NUTR 214</td>
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**Term 2**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ABEN 251</td>
<td>Microcomputer Applications</td>
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<td>ANSC 234</td>
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<tr>
<td>MICR 230</td>
<td>Microbial World</td>
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<td>NUTR 217</td>
<td>Application: Food Fundamentals</td>
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**Term 3**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>AEMA 310</td>
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<td>ANSC 323</td>
<td>Mammalian Physiology</td>
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</tr>
<tr>
<td>ANSC 330</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 322</td>
<td>Applied Sciences Communication</td>
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**Term 4**

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<tbody>
<tr>
<td>ANSC 424</td>
<td>Metabolic Endocrinology</td>
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<td>NUTR 337</td>
<td>Nutrition Through Life</td>
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</tr>
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<td>NUTR 344</td>
<td>Clinical Nutrition 1</td>
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**Term 5**

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<thead>
<tr>
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<th>Course Name</th>
<th>Credits</th>
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<tr>
<td>NUTR 450</td>
<td>Research Methods: Human Nutrition</td>
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<tr>
<td>NUTR 451</td>
<td>Analysis of Nutritional Data</td>
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**Term 6**

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**Term 7**

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<tbody>
<tr>
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<tr>
<td>NUTR 410*</td>
<td>Professional Practice - Stage 4</td>
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**NUTRITION MAJOR**

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.

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**CREDITS**

**Term 1**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>FDSC 211</td>
<td>Biochemistry 1</td>
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<td>FDSC 212</td>
<td>Biochemistry Laboratory</td>
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<td>NUTR 207</td>
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**Term 2**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ABEN 251</td>
<td>Microcomputer Applications</td>
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<tr>
<td>ANSC 234</td>
<td>Biochemistry 2</td>
<td>3</td>
</tr>
<tr>
<td>MICR 230</td>
<td>Microbial World</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 217</td>
<td>Application: Food Fundamentals</td>
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**Term 3**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>AEMA 310</td>
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<td>ANSC 323</td>
<td>Mammalian Physiology</td>
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<tr>
<td>ANSC 330</td>
<td>Fundamentals of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>NUTR 322</td>
<td>Applied Sciences Communication</td>
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**Term 4**

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<tbody>
<tr>
<td>ANSC 424</td>
<td>Metabolic Endocrinology</td>
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<td>NUTR 337</td>
<td>Nutrition Through Life</td>
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<td>NUTR 344</td>
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**Term 5**

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<tr>
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<tr>
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**Term 6**

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<tr>
<td>NUTR 410*</td>
<td>Professional Practice - Stage 4</td>
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**Nutritional Biochemistry Option:**

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<tr>
<td>Term 5</td>
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<td>Term 5</td>
<td>ANSC 551 Carbohydrate and Lipid Metabolism</td>
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<tr>
<td>Term 3 or 5</td>
<td>AEPH 303 Advances in Atomic and Nuclear Science</td>
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<td>AEPH 405 Tracer Techniques</td>
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**Nutrition and Populations Option:**

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<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Term 5</td>
<td>NUTR 406 Ecology of Human Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>Term 6</td>
<td>NUTR 403 Nutrition in Society</td>
<td>3</td>
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**Select 6 credits from those listed below or any other social science courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>NUTR 301</td>
<td>(3) Psychology</td>
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<tr>
<td>ENV 203</td>
<td>(3) Knowledge, Ethics and Environment</td>
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</table>
Nutrition of Food Option: 12
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

CREDITS
Required Courses: 6
NUTR 337 Nutrition Through Life 3
NUTR 450 Research Methods: Human Nutrition 3

Complementary Courses: 18 or 19

CREDITS
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:
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; 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
Website: agrenv.mcgill.ca/foodscience

Chair — TBA


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 major for those students interested in the interdisciplinary 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.

CREDITS
Required Courses: 66
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
FDSC 495D1 Food Science Seminar 1.5
FDSC 495D2 Food Science Seminar 1.5
MCIR 230 Microbial World 3
MICR 442 Food Microbiology and Sanitation 3
NUTR 207 Nutrition and Health 3

* Students who have not taken CEGEP object 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

**AGRI 340** Principles of Ecological Agriculture 3
**AGRI 341** Ecological Agriculture Systems 3
**AGRI 435** (3) Soil and Water Quality Management
**AGRI 491D2** (1.5) Co-op Experience
**AGRI 491D1** (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.

![](credit_table.png)
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.

Required Courses: 52 credits

CREDITS

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 credits

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, AGEC, 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.

Required Courses: 64 credits

CREDITS

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 credits

As described for the Agricultural Sciences Major – General Option.

AGRICULTURAL SCIENCES MAJOR – ECOCLOGICAL AGRICULTURE OPTION (90 credits)

Required Courses: 61 credits.

Complementary Courses: 16 to 19 credits.

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

Required Courses: 61 credits

CREDITS

AGRI 340 Principles of Ecological Agriculture 3
AGRI 341 Principles of Ecological Agriculture 3
AEBI 205 Principles of Ecology 3

Complementary Courses: 16 to 19 credits

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
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.

CREDITS

Required Courses: 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: 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.

CREDITS

Required Courses: 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: 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 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.

CREDITS

Required Courses: 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: 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.

CREDITS

Required Courses: 52

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

Complementary Courses: 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
Applied Zoology Major

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.

Complementary Courses: 25 credits.
Electives: selected in consultation with Academic Adviser, to meet the minimum 102-credit requirement for the degree.
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, or the Faculty Website at www.agrENV.mcgill.ca/envschool.

ENVIRONMENTAL BIOLOGY MAJOR

[Program revisions are under consideration for September 2003. Go to 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.

Required Courses: 29
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 331 Microbial Ecology
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 438 Immunology 3
PLNT 201 Comparative Plant Biology 3
ZOOL 424 Parasitology 3

CREDITS

RESOURCE CONSERVATION MAJOR

[Program revisions are under consideration for September 2003. Go to 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.

Required Courses: 25
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

CREDITS
WILDS 491 Seminar 2
ZOO 315 Science of Inland Waters 3

**Complementary Courses:** 33
- AEMA 310 (3) Statistical Methods 1
- or MATH 203 (3) Principles of Statistics 1
- PLNT 201 (3) Comparative Plant Biology 3
- or PLNT 211 (3) Principles of Plant Science 3

At least two of the following: 6
- ABEN 214 (3) Surveying
- ABEN 217 (3) Hydrology and Drainage
- or GEOG 322 (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 (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 (4) Soil Chemistry
- NRSC 521 (3) Soil Microbiology and Biochemistry

At least one of the following: 3
- GEOG 201 (3) Introductory Geo-Information Science
- ABEN 330 (3) GIS for Biosystems Engineering
- WILD 310 (3) Air Photo and Imagery Interpretation 1

**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 (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.

**Required Courses:** 37
- 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 Propogation
- 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
Telephone: (514) 398-7851
E-mail: plantscience@mcdonald.mcgill.ca
Website: www.mcgill.ca/plant

**Chair —** Marc Fortin

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

**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, Aijamada C. Kushalappa, Katrina 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' Donoughue

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.) A minimum of 90 credits is needed to complete each Major. It is recommended that students take organic chemistry prior to entering these Majors.
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.

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

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

- **Electives:** at least 12 credits must be chosen from the following:

**Molecular Option:**

- 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**

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.

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

**Electives:** at least 12 credits must be chosen from the following:

**AEBI 306 (3) Mathematical Methods in Ecology**
**AGRI 340 (3) Principles of Ecological Agriculture**
*"BIOL 324 (3) Biological 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.
MINOR IN AGRICULTURAL PRODUCTION

Academic Adviser: Professor K. A. Stewart

e-mail: 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:

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

b) offer a minimum total of 24 credits from the courses as given below, of which not more than 6 credits may be counted for both the Major and the Minor programs. This restriction does not apply to elective courses in the Major program.

Required Courses: 12 credits

Complementary Courses: 18 credits

A minimum of 12 credits selected from the following list:

- PLNT 315 (3) Plant Breeding
- PLNT 460 (3) Plant Ecology
- PLNT 421 (3) Landscape Plant Materials
- PLNT 348 (1) The Brassicas
- PLNT 347 (1) Horticulture - Small Fruits
- PLNT 346 (1) Horticulture - Temperate Fruits
- PLNT 345 (1) Horticulture - Solanaceous Crops
- PLNT 344 (1) Horticulture - Salad Crops
- PLNT 343 (1) Horticulture - Root Crops
- PLNT 342 (1) Horticulture - Cole Crops
- PLNT 341 (1) Horticulture - The Alliums
- PLNT 331 (3) Field Crops
- PLNT 322 (3) Greenhouse Management
- PLNT 311 (1) Introduction to Fungi
- PLNT 221 (1) Introduction to Vascular Plants
- PLNT 220 (1) Orientation in Plant Science
- FDSC 310 (3) Post Harvest Fruit and Vegetable Technology
- PLNT 215 (1) Introduction to Fungi
- PLNT 214 (1) Introduction to Vascular Plants
- PLNT 213 (1) Introduction to Fungi
- PLNT 212 (1) Introduction to Vascular Plants
- PLNT 211 (1) Introduction to Fungi
- PLNT 210 (1) Introduction to Vascular Plants

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; complete listings can be found in the Courses section of this Calendar.
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 agriculture 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:

<table>
<thead>
<tr>
<th>Full-time students (four or more individual courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Semester</strong></td>
</tr>
<tr>
<td>Fall 1</td>
</tr>
<tr>
<td>Winter 1</td>
</tr>
<tr>
<td>Fall 2</td>
</tr>
<tr>
<td>Winter 2</td>
</tr>
<tr>
<td>Fall 3</td>
</tr>
<tr>
<td>Winter 3</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th><strong>Semester</strong></th>
<th><strong>Description</strong></th>
<th><strong>Course number</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 1</td>
<td>Global Registration 7</td>
<td>AGRI D14</td>
</tr>
<tr>
<td>Winter 1</td>
<td>Global Registration 8</td>
<td>AGRI D15</td>
</tr>
<tr>
<td>Fall 2</td>
<td>Global Registration 9</td>
<td>AGRI D16</td>
</tr>
<tr>
<td>Winter 2</td>
<td>Global Registration 10</td>
<td>AGRI D17</td>
</tr>
<tr>
<td>Fall 3</td>
<td>Global Registration 11</td>
<td>AGRI D18</td>
</tr>
<tr>
<td>Winter 3</td>
<td>Global Registration 12</td>
<td>AGRI D19</td>
</tr>
</tbody>
</table>

**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 a 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.

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.

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) 398-1992. Applications for McGill loans may be obtained from the Coordinator.

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

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