FACULTY OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES
INCLUDING SCHOOL OF DIETETICS AND HUMAN NUTRITION

Table of Contents

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: http://www.agrenv.mcgill.ca

The Faculty of Agricultural and Environmental Sciences, and the School of Dietetics and Human Nutrition are located on the Macdonald Campus of McGill at Ste. Anne-de-Bellevue at the western end of Montreal Island. It is served by public transport (M.U.C.T.C. bus and train) and is easily reached from the McGill Downtown Campus and from Dorval International airport.

1.2 Administrative Officers

TAK-HANG (BILL) CHAN, B.Sc.(Tor.), M.A., Ph.D.(Prin.), F.C.I.C., F.R.S.C. — **Vice-Principal (Academic) and Vice-Principal (Macdonald Campus) (to July 14, 1999)**

T.B.A. — **Vice-Principal (Macdonald Campus) (from July 15, 1999)**

DEBORAH J.I. BUSZARD, B.Sc.(Bath), Ph.D.(Lond.) — **Dean, Faculty of Agricultural and Environmental Sciences**

ERIC R. NORRIS, B.S.A.(Tor.), M.Sc.(Guelph), Ph.D.(Mich. St.) — **Associate Dean (Academic and 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 and Graduate Studies)**

JANET FINLAYSON, B.Sc.(H.Ec.), B.L.S.(McG.) — **Librarian**

GARY O'CONNELL, B.Comm.(C'dia) — **Director of Administrative Services**

PETER D.L. KNOX, B.Sc.(Agr.)(McG.) — **Manager, Campus Services**

WILLIAM R. ELLYETT, B.A.(Sir G. Wms.), B.Ed.(Phys.Ed.)(McG.) — **Director of Athletics**

LAURIE BAKER — **Director of Macdonald Farm**

GINETTE LEGAULT — **Manager, Residence Office**

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 Sciences, Environmental Sciences, Biological Sciences, Food Science, Engineering and Nutritional Sciences. The Faculty of Agricultural and Environmental Sciences is also one of the three faculties in partnership with the McGill School of Environment.

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

The School 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 offers graduate programs leading to M.Sc. and Ph.D. degrees as well as a 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.

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

1.4 Macdonald Campus Facilities

The Macdonald Campus, established in 1907, consists of approximately 800 hectares on the shore of beautiful Lake St. Louis. It includes the Morgan Arboretum which 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, a bird sanctuary, 20 kilometres of wooded trails, a variety of forest ecosystems, soil and water conservation projects, forest operations such as reforestation, plantation management, timber harvesting and maple syrup production, and related forestry-wildlife ecological activities. A volunteer-run nature interpretation program is offered.

Laboratory and lecture rooms are well supplied with modern and efficient teaching facilities, while the reference section of the Library and the research laboratories associated with the various science departments are well equipped to permit the vigorous investigation of problems at the post-graduate level.

MACDONALD CAMPUS LIBRARY

The Library is located in the Barton Building. The collection includes materials in the agricultural, biological, environmental, food and nutritional sciences. The Lyman Room houses a special collection on entomology. The Library is a depository for many government publications and currently receives over 770 serial titles. The total collection numbers 95,500 volumes of books and journals, and 17,000 volumes of government documents. The online catalogue includes the holdings of all McGill libraries, and the automated circulation system controls the circulation of materials. Reference services include access to computerized databases on CD-ROM and the Internet as well as excellent interlibrary loan facilities . A library instruction program is available throughout the year.

LYMAN ENTOMOLOGICAL MUSEUM AND RESEARCH LABORATORY

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

BRACE RESEARCH INSTITUTE

Part of the Brace Research Institute (Faculty of Engineering, Department of Chemical Engineering) is located on the Macdonald Campus. The principal area of research is desalination of water for drinking and irrigation, especially in arid areas. Relevant aspects of renewable energy sources are also considered.

2 Student Information

The information provided below is specific to Macdonald Campus and should be considered as supplementary to that which is contained in the General University Information section. Students are also advised to consult that section for information regarding topics such as health insurance, immigration, etc. Information is also available on the McGill Student Services Website (http://www.mcgill.ca/StuServ/).

2.1 Student Services

Students with temporary or permanent physical disabilities may obtain information concerning special support services from the Office of the Associate Dean (Academic and Student Affairs).

The Student Services Centre is located in Rowles House, telephone (514) 398-7992. Available at that location are offices of the Counselling Services, Health Services, Off-Campus Housing, Student Aid, and Career and Placement Services.

COUNSELLING SERVICES – A professional counsellor is available on campus twice a week offering counselling for personal, social and emotional concerns as well as for academic and vocational concerns. Appointments are required.

HEALTH SERVICE – McGill has two student health clinics, one on the Macdonald Campus and the other on the Downtown Campus. A referral service on the Macdonald Campus is available Monday through Friday. A nurse/health educator is on Campus twice a week and a physician may be seen by appointment on specified dates. All information is confidential and does not form any part of the student's University record. Students who wish to be followed by Student Health Service for particular health needs, should have their physician forward relevant information to Health Service.

Students in the Dietetics Major are encouraged 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.

OFF-CAMPUS HOUSING – The Macdonald Campus service is available from June 1 to August 31 each year.

STUDENT AID OFFICE – Information about government loans, McGill loans and bursaries, and the Work Study Program can be obtained from the Coordinator at the Student Service Centre. During the academic year (September to April) a counsellor visits the campus twice monthly to help students with financial problems.

CAREER AND PLACEMENT SERVICE (CAPS) – Student Services, in cooperation with the Faculty, provides a Career and Placement Service on Campus to bring together potential employers and students seeking permanent, summer and part-time career-related work. CAPS also provides job search assistance individually and in groups, assists with Career Day and is aiming to enhance co-op opportunities for students. Services are available to currently registered students and those who have been away from the Campus for less than one year.

ATHLETICS – Facilities available to Macdonald students are a gymnasium, pool, weight room, an indoor arena, tennis courts and large expanses of green space.

The athletics program is designed to help students relax in their spare time. It also allows the students to learn, practise or use a skill which they have developed during one of the many programs offered. Four types of programs are offered: instructional, recreational, intramural and intercollegiate. There are over 60 programs in all. A handbook, with complete information on all programs, is available at the Athletics Office in the Stewart Athletic Complex west of the Centennial Centre, telephone (514) 398-7789.

2.2 Macdonald Campus Residence

For more than 90 years, residence life has been an integral part of Macdonald Campus activities. Laird Hall, with a capacity of more than 210 students, is arranged on a co-educational basis and provides accommodation for both undergraduate and graduate students. Residents enjoy comfortable rooms, modern kitchens, cosy lounge facilities, and other amenities which help make their residence life a complete and meaningful part of their university experience.

Since the spring of 1998, the EcoResidence has been under renovation and is now available to accommodate 100 students. The EcoResidence is a unique initiative that recycled two buildings and incorporated the newest ecological construction technology. This type of accommodation will appeal to students who enjoy independent living in self-contained apartments of two or six single bedroom units. Each unit is built on a split-level concept with large, airy common living areas and fully equipped kitchens.

Applications for residence and inquiries concerning the residence should be addressed to the Campus Housing Office, P.O. Box 192, Macdonald Campus of McGill University, Sainte-Anne-de-Bellevue, QC, H9X 3V9. Telephone: (514) 398-7716.

Residence Fees

Residence fees are paid separately from tuition in accordance with regulations of the Fee Payment Option selected at the time of signing a Residence Lease.

The residence fees for the 1999-2000 session had not been set at the time this Calendar went to print. The 1998-99 session rates for Laird Hall were (Double occupancy) $1,840 and (Single occupancy) $2,056. Rates for the EcoResidence are available upon request. An updated fee sheet will be available with the residence application forms when an offer of accommodation is made.

The Macdonald Campus Residence operation does not offer a Board Plan. Meals are on a cash basis and may be obtained from the Snack Bar facility of the Centennial Centre. The Snack Bar is open for breakfast and lunch only, 5 days per week, exclusive of Saturday, Sunday and holidays designated by the University. Students may buy individual meals on a cafeteria basis. Should a Laird Hall resident wish to arrange for a meal plan which would include dinner on a Monday to Friday basis, this service could be provided by the Snack Bar.

For budgeting purposes, the approximate cost of meals per person per session might be considered to be $3,000.

Application for Residence Accommodation – New Students

New students who wish to be considered for residence accommodation should indicate this on their Application for Admission. More detailed information about the residence can be obtained from the Campus Housing Office. Students are advised to apply as early as possible. When the form is received it must be completed and returned immediately to the Campus Housing Office.

Please note that it is not possible to alter any of the terms of the original application (lease) except in special circumstances.

Room Occupancy

Residence fees cover the period September 1 to April 30. Students must vacate their rooms at the end of the lease term. Only under exceptional circumstances will a student be granted permission to arrive prior to September 1 or remain in residence during the summer months. In any such case specific permission must be requested from the Campus Housing Office and an additional fee would be charged.

International students or those coming from a distance may be admitted early in exceptional circumstances. Permission must be received from the Campus Housing Office before the student leaves home. Student officers may be admitted before the opening date of courses, if permission is granted by the Campus Housing Office.

Students needing residence accommodation after April 30 must apply to the Campus Housing Office before the end of March. Students taking extended courses after the regular session, employed on the Campus, or registered for summer courses may request permission to extend their stay in residence.

NON-RESIDENT STUDENTS

Non-resident students may not stay overnight in any residence without permission of the Campus Housing Office. Common rooms, for studying, are provided for non-resident students in the Centennial Centre and Barton Building.

Meals are available in the Centennial Centre for non-resident students.

Lockers are available in the Macdonald Stewart Building for non-resident students. These may be arranged for at the Students' Society Office in Centennial Centre one week after fall and winter registration.

STUDENT PARKING

Students who hold parking permits will be allowed to park automobiles on the Campus provided they observe the parking regulations and other applicable rules. Permits must be obtained from the Campus Security Office during regular office hours.

2.3 Extracurricular Activities

All undergraduate, postgraduate, and Farm Management and Technology students are members of the Macdonald Campus Students' Society. 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 are Orientation, the Halloween Party, Winter Carnival and International Night. The student-run bar, the Ceilidh, is open every Thursday night in the Centennial Centre (C.C.).

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, a pool table, a café, great places to relax, listen to music and meet friends. Also located in the C.C. are the Students' Council offices, an information desk, and the campus store, the Robber's Roost.

2.4 Student Conduct and Discipline

The Vice-Principal, Macdonald Campus and the Dean of the Faculty of Agricultural and Environmental Sciences have 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 wilful 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 (http://www.mcgill.ca/Secretariat/Students/) or obtained from the Associate Dean (Academic and Student Affairs). 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.

Any student who is unwilling to submit to the demands of university life, or whose work is definitely unsatisfactory, may be placed on probation, or may be required to withdraw from the University.

All students are obliged to inform themselves of the current rules and regulations. A few of these are listed below but the main body of them will be found in other available documents.

Possession or consumption of liquor by students is forbidden on the Campus, except in authorized places and with special permission.

Initiation or hazing in any form is forbidden.

Unauthorized entrance to buildings is forbidden. Violation of this rule is sufficient reason for expulsion.

Gambling is not permitted on Campus.

Tampering with fire fighting equipment is forbidden.

Students are not permitted to bring firearms into a Residence nor is the use of firearms allowed on University property.

2.5 Fees

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

All cheques, money orders, etc., should be drawn to the order of McGill University, and should be made payable in Canadian funds.

The Student Affairs Office is open to provide student fee information 09:00 to 12:00, Monday to Friday.

Payment of student fees can 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, section 4 on page 18.

OTHER EXPENSES

In addition to tuition fees, and the cost of accommodation and meals, students should be prepared to spend a minimum of $700 on prescribed textbooks and classroom supplies. These may be purchased at the Campus Book Shop 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.

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) in the Pure and Applied Sciences or the Health Sciences or its equivalent. (Applicants who have completed the DEC en sciences, lettres et arts are also eligible for admission. Applicants who have completed a DEC in a technical area are considered on an individual basis.)

Based upon entry with the appropriate DEC, the B.Sc.(Agr.) and the B.Sc.(F.Sc.) are both three-year programs. The B.Sc.(Agr.Eng.) is a three to 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 the province of Quebec who are accepted on the basis of a high school diploma enter a program which is extended by one year to include the 30 credits which comprise the Freshman Year.

For information, or to obtain an application package, contact:

Student Affairs Office
Macdonald Campus of McGill University
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec, H9X 3V9
Telephone: (514) 398-7928
Email: studentinfo@macdonald.mcgill.ca

Please note that the same Application Form is also used to request admission to the Faculties of Arts, Education, Engineering, Management, and Science, and that a second choice of program may be entered on the form. The Electronic Application may also be used when applying for admission to Faculty of Agricultural and Environmental Sciences programs.

More specific information on application deadlines and admission requirements may be found in the General University Information and Regulations section 2 on page 10.

4 Faculty Information and Regulations

4.1 Categories of Students

Full-Time Students

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

Full-time students in probationary standing are not normally permitted to take more than 12 credits per semester. 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 semester. New students apply through the Student Affairs Office of the Faculty and the applicant must have the qualifications to enter a full-time program. Full-time students who wish to become part-time must consult the Office of the Associate Dean (Academic and Student Affairs). Certain programs must be completed within a specified number of years; such information is available from the Associate Dean.

4.2 Academic Standing – B.Sc.(Agr.), B.Sc.(Agr.Eng.) and B.Sc.(F.Sc.) B.Sc.(Nutr.Sc.)

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.

Examinations and papers may be written in either English or French.

Upon payment of a fee a student may apply to the office of the Associate Dean of the Faculty to have an examination re-read.

Credit System

Please refer to General University Information section 5.12 on page 25.

4.3 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 permission of the Associate Dean of the Faculty, register for 3 credits, or exceptionally 6 credits, in each semester 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 Fac-

ulty. Further details on the Quebec Inter-University Transfer Agreement are found in the General University Information section 7.3 on page 27.

4.4 Graduate Courses Available to Undergraduates

Undergraduates wishing to take such courses must have a cumulative grade point average (CGPA) of at least 3.2.

4.5 Standing

The program for the degree will normally be completed in three academic years or six semesters. For the purpose of student classification, the years will be termed U1, U2 and U3.

U1 to be used during the first 12 months following each admission to a degree program in which the student is required to complete 72 or more credits at the time of admission.

U2 to be used for all students who are not U1 or U3.

U3 to be used during the session in which it is expected the student will qualify to graduate.

Students' academic standing is based on the CGPA which is calculated on the courses taken while registered as a full-time or part-time undergraduate in a degree program. If the CGPA drops below 2.00, the student is in academic difficulty.

4.6 Students in Academic Difficulty

1. When a student's CGPA (or SGPA in the first semester of the program) drops below 2.00, withdrawal is advised. Students who choose to reregister are on probation until the CGPA is raised to 2.00.
2. Students on probation are normally permitted (see the section on classes of students) to register for not more than 12 credits per semester. They are not permitted to be on probation for more than one semester unless they obtain a SGPA of 2.50 or higher.
3. Students who do not raise their CGPA to 2.00 (or obtain a SGPA of 2.50) while on probation are not permitted to register. They are required to withdraw from the Faculty for at least one semester. If after this students wish to be readmitted, they must apply in writing to the Committee on Academic Standing observing the published application deadlines.

4.7 Course Change Information

1. Courses: please refer to the Calendar of Dates, page 5.
2. Course withdrawal (Transcript notation of "W"): please refer to the Calendar of Dates, page 6.
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.

For additional information see the General Information and Regulations section 5.9 “Change of Course (Drop/Add)” on page 24 and section 5.10 “Regulations Concerning Withdrawal” on page 24.

4.8 Degree Requirements

To be eligible for a degree, students must have passed all required and complementary courses and also any specified electives recommended by their adviser. They must have have a CGPA of at least 2.00 and have accumulated at least 90 credits for a B.Sc.(Agr.), B.Sc.(F.Sc.) or B.Sc.(Nutr.Sc.); 115 credits for the dietetics program including stages of professional formation; or 106 credits for a B.Sc.(Agr.Eng.). At least 60 of these credits must have been taken at McGill.

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.

4.9 Language Requirement for Professions

Quebec law requires that candidates seeking admission to provincially-recognized Quebec professional corporations 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.

The Faculty offers the following courses to assist students in acquiring a satisfactory level of proficiency in French: 354-306A Français fonctionnel - aliments et nutrition and 354-307A Français fonctionnel - agriculture.

For additional information see the General University Information section 10.1 on page 29.

4.10 Academic Advisers

Before registration, all students entering the Faculty must select a Major program of study. They must consult with the Academic Adviser of their chosen program for the selection and timetabling of required, complementary, and elective courses. The Academic adviser will continue to act in this capacity during the whole of the student's studies in the Faculty.

4.11 Attendance and Conduct in Class

Matters of discipline connected with, or arising from, the general arrangement for teaching are under the jurisdiction of the Dean of the Faculty 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 can only be excused on the 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 can only be provided 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 can only be granted in case of illness or other exceptional circumstances.

5 Academic Programs

5.1 Outline of Academic Programs

Programs leading to five degrees are offered on the Macdonald Campus, with Majors associated with each degree. A Certificate in Ecological Agriculture is also offered. Detailed information about each Major and the Minors can be found in the section on the administering department.

MAJOR PROGRAMS
(administering department shown in brackets)

Bachelor of Science in Agriculture - B.Sc.(Agr.)
This is a three-year program from the Diploma of Collegial Studies leading to professional qualification in Agricultural Science or in one of its related specialized branches in Biological Science, Environmental Science or Renewable Resources.

Agricultural Economics (Agricultural Economics, page 424)
Agribusiness Option
Agricultural Systems Option

Animal Biology (Animal Science, page 428)

Animal Science (Animal Science, page 428)

Applied Zoology (Natural Resource Sciences, page 432)

Botanical Science (Plant Science, page 436)

Environmental Biology (Natural Resource Sciences, page 433)

General Agricultural Sciences (Plant Science, page 431)

Microbiology (Natural Resource Sciences, page 434)

Plant Science (Plant Science, page 436)
Ecology Option
Molecular Option

Resource Conservation (Natural Resource Sciences, page 434)

Soil Science (Natural Resource Sciences, page 434)
Soils and Crops Option
Soil Conservation Option

Wildlife Biology (Natural Resource Sciences, page 435)

Bachelor of Science in Agricultural Engineering - B.Sc.(Agr.Eng.)
This is a three to three and one-half year program from the Diploma of Collegial Studies in Pure and Applied Sciences leading to professional qualification in Agricultural Engineering.

Agricultural Engineering (Agricultural and Biosystems Engineering, page 426)

Bachelor of Science in Food Science - B.Sc.(F.Sc.)
This is a three-year program from the Diploma of Collegial Studies leading to professional qualification in Food Science.

Food Science (Food Science and Agricultural Chemistry, page 430)

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 program for Nutrition and a three and one-half year program for Dietetics from the Diploma of Collegial Studies. Both the Nutrition and Dietetics programs lead to professional qualification.

Dietetics (School of Dietetics and Human Nutrition, page 428)

Nutrition (School of Dietetics and Human Nutrition, page 429)
Nutritional Biochemistry Option
Nutrition and Population Option
Nutrition of Food Option

Bachelor of Science - B.Sc.
This is a three-year program from the Diploma of Collegial Studies.

Environment (McGill School of Environment, page 459)

MINOR PROGRAMS

Agricultural Economics (Agricultural Economics, page 425)

Agricultural Engineering (Agricultural and Biosystems Engineering, page 427)

Agricultural Production (Plant Science, page 437)

Ecological Agriculture (Interdisciplinary Studies, page 431)

Environment (McGill School of Environment, page 458)

Environmental Engineering (Agricultural and Biosystems Engineering, page 427)

Environmental Forestry (Natural Resources Sciences, page 433)

Human Nutrition (School of Dietetics and Human Nutrition, page 430)

CERTIFICATE PROGRAM

Ecological Agriculture (Ecological Agriculture Program, page 431)

DIPLOMA PROGRAMS

Farm Management and Technology Program, page 451

Environment (McGill School of Environment, page 463)

5.2 Environmental Sciences Programs

McGill School of Environment (MSE)

The McGill School of Environment (MSE), a joint initiative of the Faculty of Agricultural and Environmental Sciences, the Faculty of Arts, and the Faculty of Science, offers a B.Sc. Major in Environment, a B.A. Faculty Program in Environment, a Minor in Environment and a post-graduate 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. For further information on these programs, please refer to the McGill School of Environment, page 457.

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, page 425

Applied Zoology Major, page 432

Botanical Science Major, page 436

Environmental Biology Major, page 433

Environmental Forestry Minor, page 433

Microbiology Major, page 434

Resource Conservation Major, page 434

Wildlife Biology Major, page 435

5.3 Freshman Entry Program

Below is the Freshman Year program outline for recent high school graduates from Canada (except Quebec) and the United States. Individual course descriptions can be found at the end of this section of the Calendar.

		CREDITS	
Fall			
344-120A	General Biology	3	
333-110A	Inorganic Chemistry	4	
360-101A	Calculus I	3	
338-112A	Introductory Physics I	4	**14**
Winter			
333-230B	Organic Chemistry	4	
360-102B	Calculus II	3	
338-114B	Introductory Physics II	4	
	Electives*	5	**16**
Total Credits			**30**

* 344-202B Cellular Biology must be substituted for students in programs in the B.Sc.(Nutr.Sc.) degree and 336-103A,B Linear Algebra must be substituted for students in the B.Sc.(Agr.Eng) degree.

5.4 Department of Agricultural Economics

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

Associate Professors — H. GARTH COFFIN (PT), KISAN R. GUNJAL, JOHN C. HENNING, PAUL THOMASSIN *(CHAIR)*

Assistant Professors — LAURENCE BAKER, PETER GOLDSMITH

Lecturer — MARCEL J. COUTURE

Associate Member — CHRISTOPHER GREEN

AGRICULTURAL ECONOMICS MAJOR

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

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

Core Required Courses: 15 credits.

Core Complementary Courses: 22 credits.

		CREDITS
Required Courses:		**15**
334-200A	Principles of Microeconomics	3
334-201B	Principles of Macroeconomics	3
334-230B	Economics of Marketing	3
334-320B	Economics of Agriculture Production	3
334-425A	Agricultural Econometrics	3
Complementary Courses:		**12**
A microcomputer applications course (approved by adviser)		3
A statistical methods course (approved by adviser)		3
plus 6 credits chosen from the following three courses		6
367-211A (3)	Principles of Plant Science	
342-250A (3)	Principles of Animal Science	
372-210A (3)	Principles of Soil Science	

AGRIBUSINESS OPTION

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

Core Required and Complementary Courses: 27 credits.

Option Required Courses: 33 credits.

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

		CREDITS
Option Required Courses:		**33**
271-313	Managerial Accounting I	3
278-382	Introduction to International Business	3
280-211	Accounting I	3
280-341	Finance I	3
334-231B	Economic Systems of Agriculture	3
334-242A	Management Theories and Practices	3
334-331A	Farm Business Management	3
334-450B	Agribusiness Management	3
334-452B	Studies in Agribusiness	3
382-446A	Personnel Management	3
425-201	Effective Written Communication	3

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: 27 credits.

Option Required Coures: 21 credits.

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

		CREDITS
Option Required Courses:		**21**
334-231B	Economic systems of Agriculture	3
334-333A	Resource Economics	3
334-350B	Agricultural Finance	3
334-430B	Agriculture, Food, and Resource Policy	3
334-440A	Advanced Agricu lture & Food Marketing	3
334-442B	Economics of International Agricultural Development	3
334-491A	Research Seminar in Agricultural Economics	3

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: 27 credits.

Option Required Courses: 32 credits.

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

		CREDITS
Option Required Courses:		**32**
154-405B	Natural Resource Economics	3
334-333A	Resource Economics	3
334-343B	Accounting and Cost Control	3
334-491A	Research Seminar in Agricultural Economics	3
344-205B	Principles of Ecology	3
338-201A	Introductory Meteorology	3
360-306A	Mathematical Methods in Ecology	3
375-201B	Renewable Resources	3
375-333A	Physical and Biological Aspects of Pollution	3
375-415A	Conservation Law	2
375-437B	Assessing Environmental Impacts	3

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**
334-200A	Principles of Microeconomics	3
334-201B	Principles of Macroeconomics	3
334-230B	Economics of Marketing	3
334-231B	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.

334-242A (3) Management Theories and Practices
334-320B (3) Economics of Agriculture Production
334-331A (3) Farm Business Management
334-333A (3) Resource Economics
334-343B (3) Accounting and Cost Control
334-350B (3) Agricultural Finance
334-425A (3) Agricultural Econometrics
334-430B (3) Agriculture, Food, and Resource Policy
334-440A (3) Advanced Agricultural and Food Marketing
334-442B (3) Economics of International Development
334-450B (3) Agribusiness Management
334-452B (3) Studies in Agribusiness
334-492A,B (3) Special Topics in Agricultural Economics

5.5 Department of Agricultural and Biosystems Engineering

Macdonald Stewart Building – Room MS1-027
Telephone: (514) 398-7773
Fax: (514) 398-8387
Email: Raghavan@Agreng.Lan.McGill.Ca
Website: http://agrenv.mcgill.ca/agreng

Emeritus Professor — ROBERT S. BROUGHTON

Professors — ROBERT KOK, CHANDRA MADRAMOOTOO, EDWARD MCKYES, SHIV O. PRASHER, VIJAYA RAGHAVAN *(CHAIR)*

Associate Professors — SUZELLE BARRINGTON, ERIC R. NORRIS, JOHN D.J. SHEPPARD

Assistant Professors — ROBERT B. BONNELL *(BRACE RESEARCH INSTITUTE)*, JACQUES-ANDRÉ LANDRY, MICHAEL O. NGADI

Assistant Professor (Special Category) — SOFIA BABARUTSI

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 semester of the penultimate year taking courses in the Faculty of Engineering. Furthermore, students in Agricultural Engineering may wish to increase their competence in specialized fields by pursuing one of the Minors offered by the Faculty of Engineering. **Minors** which would be of particular interest include: **Biotechnology, Computer Science, Construction Engineering and Management,** and **Environmental Engineering.** Details of these Minors can be found in the Faculty of Engineering section 5 on page 258. In order to complete a Minor, students will need to spend at least one extra semester beyond the requirements of the B.Sc.(Agr.Eng.) program.

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

Required Courses: 80 credits.

Complementary Courses: 24 credits.

Electives: Other University courses to round out the student's program and meet the requirement of a minimum of 106 credits for the degree.

NOTE: this program is under revision. Please contact the Academic Adviser for the most up-to-date information.

		CREDITS
Required Courses:		**80**
336-210A	Mechanics I	4
336-211B	Mechanics II	4
336-214A	Surveying	3
336-216B	Materials Science	3
336-217B	Hydrology and Drainage	3
336-252A	Structured Computer Programming	3
336-305A	Fluid Mechanics	4
336-312B	Circuit Analysis	3
336-314B	Agricultural Structures	3
336-315A	Design of Machine Elements	4
336-319A	Applied Mathematics	3
336-325A	Food Engineering	3
336-341B	Strength of Materials	4
336-412A	Agricultural Machinery	3
336-418B	Soil Mechanics and Foundations	3
336-490D,N	Project	3
305-346B	Heat Transfer	3
305-362B	Mechanical Laboratory I	2
306-310A,B	Engineering Economy	3
342-250A	Principles of Animal Science	3
367-211A	Principles of Plant Science	3
372-210A	Principles of Soil Science	3
360-202A	Calculus	3
360-205B	Differential Equations	4
360-310A,B	Statistical Methods I	3
Complementary Courses, selected in consultation with Academic Adviser		**24**
336-212A (3)	Graphics	3
or 305-291B (3)	Graphics	
336-301A (3)	Biothermodynamics	3
or 305-240B (3)	Thermodynamics I	
Advanced Agricultural and Biosystems Engineering – 9 or more credits from:		9
With the permission of the instructor, graduate level courses may be taken:		
330-435A (3)	Soil and Water Quality Management	
336-322A (3)	Agro-Food Waste Management	
336-323A (3)	Physical Properties of Biological Materials	
336-330B (3)	GIS for Biosystems Management	
336-411A (3)	Off-Road Power Machinery	
336-416A (3)	Engineering for Land Development	
336-419A (3)	Structural Design	
336-500B (3)	Advanced Applications of Microcomputers in Agriculture	
336-504B (3)	Instrumentation and Control	
336-512B (3)	Soil Cutting and Tillage	
336-514B (3)	Drain Pipe and Envelope Materials	
336-515B (3)	Computer Models in Drainage Engineering	
336-516A (3)	Preparation and Appraisal of Drainage Projects	

336-517A	(3)	Drainage Project Contracts, Installation and Management
336-518A	(3)	Pollution Control for Agriculture
336-525B	(3)	Ventilation of Agr. Structures
336-530B	(3)	Advanced Food & Fermentation Engineering
336-605B	(3)	Functional Analysis of Agricultural Machines
336-606C	(3)	Land Drainage Engineering
336-607B	(3)	Engineering Aspects of Plant Environment
336-609A,B	(3)	Hydrologic Systems and Modelling
336-612A	(3)	Simulation and Modelling in Agricultural Engineering
336-616A,B	(3)	Advanced Soil & Water Engineering

Social Science, Humanities and Administrative Study courses which contribute to the awareness of the professional engineer in society and the impact of engineering work on the economic, environmental and cultural aspirations of society - 9 credits or more. 9

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 Program is administered by the Department of Civil Engineering and Applied Mechanics, see page 232 in the Faculty of Engineering section.

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

362-331B	Microbial Ecology
375-333A	Physical and Biological Aspects of Pollution
336-322A	Agro-food Waste Management
336-416A	Engineering for Land Development
336-518A	Pollution Control in Agriculture

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

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

General Regulations

To obtain a Minor in Agricultural Engineering, students must:

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

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

Required Courses: 18 credits.

Complementary Courses: 6 credits.

		CREDITS
Required Courses:		**18**
336-252A	Structured Computer Programming	3
336-314B	Agricultural Structures	3
336-324A	Elements of Food Engineering	3
336-412A	Agricultural Machinery	3

Complementary Courses: **6**

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

336-411A	(3)	Off-Road Power Machinery
336-413A	(3)	Materials Handling Systems
336-416A	(3)	Engineering for Land Development
336-418B	(3)	Soil Mechanics and Foundations
336-500B	(3)	Artificial Intelligence for Biosystems
336-512B	(3)	Soil Cutting, Tillage and Trenching
336-514B	(3)	Drain Pipe and Envelope Materials
336-515A	(3)	Computer Models in Drainage Engineering
336-516A	(3)	Preparation and Appraisal of Drainage Projects
336-517A	(3)	Drainage Project Contracts, Installation and Management
336-518A	(3)	Pollution Control for Agriculture
336-525B	(3)	Ventilation of Agricultural Structures
336-530B	(3)	Advanced Food and Fermentation Engineering

Notes:

1) Most courses listed at the 300 level and higher have prerequisites. Although instructors may waive prerequisite(s) in some cases, students are urged to prepare their program of study well before their final year.
2) Not all courses are available in any given year. Consult departmental listings for full course descriptions and offerings.

5.6 Department of Animal Science

Macdonald Stewart Building - Room MS1-084
Telephone: (514) 398-7794
Email: info@AnimSci.AgrEnv.McGill.CA
Website: http://www.animsci.agrenv.mcgill.ca

Emeritus Professor — JOHN E. MOXLEY

Professors — ELLIOT BLOCK, ROGER B. BUCKLAND, EDUARDO R. CHAVEZ, BRUCE R. DOWNEY, KWET FANE NG KWAI HANG, FLANNAN HAYES, URS KUHNLEIN

Associate Professors — ROGER I. CUE, PAUL C. LAGUË, HUMBERTO G. MONARDES, LEROY E. PHILLIP, KEVIN WADE, DAVID ZADWORNY, XIN ZHAO

Assistant Professor — RENÉ LACROIX (PT)

Adjunct Professors — MICHEL BRITTEN, ANTHOULA LAZARIS-KARATZAS, CAROL KEEFER, PIERRE LACASSE, BRUCE MURPHY, DENIS PETITCLERC, DAVID SILVERSIDES, JEFFREY D. TURNER

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

ANIMAL SCIENCE MAJOR

Academic Advisers: R.I. Cue (U1), D. Zadworny (U2), R.B. Buckland (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: 69 credits.
Complementary Courses: 6 credits.
Electives: selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

		CREDITS
Required Courses:		**69**
330-430A	Ecological Agriculture Systems	3
333-211A	Biochemistry I	3
334-200A	Principles of Microeconomics	3
342-234B	Biochemistry II	3
336-322A	Agro-food Waste Management	3
342-250A	Principles of Animal Science	3
342-301B	Principles of Animal Breeding	3
342-312B	Animal Pathology	3
342-323A	Mammalian Physiology	4
342-324A	Animal Reproduction	3
342-330A	Fundamentals of Nutrition	3
342-433B	Animal Nutrition	3
342-450A	Dairy Cattle Production	3
342-452B	Beef Cattle and Sheep Production	3
342-454B	Swine Production	3
342-456A	Poultry Production	3
342-495D	Seminar	2
344-202B	Cellular Biology	3
360-310A,B	Statistical Methods I	3
362-230B	The Microbial World	3
367-211A	Principles of Plant Science	3
372-210A	Principles of Soil Science	3
375-375B	Issues in Environmental Sciences	3
Complementary Courses:		**6**
One Ethics course:		3
170-203A,B (3)	Knowledge, Ethics and Environment	
or 260-270A (3)	Ethics and the Environment	
One additional Economics course		3

ANIMAL BIOLOGY MAJOR

Academic Adviser: P.C. Laguë

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

Required Courses: 34 credits
Complementary Courses: 24 credits, minimum
Electives: selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

		CREDITS
Required Courses:		**34**
333-211A	Biochemistry I	3
342-234B	Biochemistry II	3
342-250A	Principles of Animal Science	3
342-251B	Comparative Anatomy	3
342-323A	Mammalian Physiology	4
342-330A	Fundamentals of Nutrition	3
342-495D,N	Seminar	2
344-202B	Cellular Biology	3
356-204A	Genetics	4
360-310A,B	Statistical Methods I	3
362-230B	The Microbial World	3
Complementary Courses:		**min. 24**

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

342-312B	(3)	Animal Pathology
342-324A	(3)	Animal Reproduction
342-424B	(3)	Metabolic Endocrinology
342-433B	(3)	Animal Nutrition
342-460B	(3)	Biology of Lactation
349-307A	(3)	Natural History of the Vertebrates
or 349-308B	(3)	Comparative Morphology of the Vertebrates
349-311B	(3)	Ethology
349-424B	(3)	Parasitology
391-400B	(3)	Eukaryotic Cells and Viruses
391-438A	(3)	Immunology
375-410B	(3)	Wildlife Ecology

5.7 School of Dietetics and Human Nutrition

Macdonald Stewart Building – Room MS2-039
Telephone: (514) 398-7842
Email: dietstage@agradm.lan.mcgill.ca
Website: http://dietetic.mcgill.ca

Emeritus Professor — HELEN R. NEILSON

Professor — PETER J.H. JONES *(DIRECTOR)*, HARRIET V. KUHNLEIN

Associate Professors — KATHERINE GRAY-DONALD, TIMOTHY A. JOHNS, KRISTINE G. KOSKI, STAN KUBOW, LOUISE THIBAULT

Assistant Professors — DAVID BISSONNETTE, LAURIE CHAN, OLIVIER RECEVEUR, LINDA WYKES

Lecturers — LINDA JACOBS STARKEY, MAUREEN LUCAS, APRIL MATSUNO, JOANE ROUTHIER MAYRAND, SANDY PHILLIPS, HUGUES PLOURDE, DONNA SCHAFER, R. STOJAK (PT)

Adjunct Professors — KEVIN A. COCKELL, JEFFREY S. COHN

Cross-Appointed Staff —
Food Science and Agricultural Chemistry: S. Kermasha
Medicine: Louis Beaumier, Franco Carli, Katherine Cianflone, R. Gougeon, L.J. Hoffer, E. Marliss , Shi-Hsiang Shen, J-F. Yale
Parasitology: M.E. Scott
Psychiatry: S. 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 and preparation of food, normal 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. Graduates of these programs are prepared for careers as dietitians, nutritionists and food administrators.

DIETETICS MAJOR

Academic Advising Coordinator: Linda Jacobs Starkey

Dietitians are qualified for challenging professional and leadership positions related to food and health. The designations "Dietitian" and "Nutritionist" are reserved titles in the province of Quebec. As clinical nutritionists, dietitians may work in health and food service centres and hospitals, nutrition counselling centres, clinics and private practice. As community nutritionists, dietitians are involved in nutrition education programs through schools, sports centres and local and international health service agencies. The dietitian in the food service sector participates in all aspects of management to

assure quality food products. Postgraduate programs are available to qualified graduates. The duration of the program is three and one-half years. Successful graduates are qualified for membership in Dietitians of Canada and the Ordre Professionnelle de diététistes du Québec. Forty weeks supervised professional experience in clinical and community nutrition and food service systems management are included.

Required Courses: 103 credits.
(Note: The School firmly applies prerequisite requirements (with C grade as pass) for registration in all required courses in the Nutrition and Dietetics Majors.)
Complementary Courses: 6 credits.
Electives: 6 credits, selected in consultation with an Academic Adviser, to meet the minimum 115-credit requirement for the degree.

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

		CREDITS
Term 1		**17**
333-211A	Biochemistry I	3
333-212A	Biochemistry Laboratory	2
336-251A	Microcomputer Applications	3
382-214A	Food Fundamentals	3
334-242A	Management Theories and Practices	3
One Elective or Complementary		3
Term 2		**19**
342-234B	Biochemistry II	3
362-230B	The Microbial World	3
382-217B	Application of Food Fundamentals	3
382-207A,B	Nutrition and Health	3
382-208J*	Professional Practice (Stage) in Dietetics Level I	4
One Elective or Complementary		3
Term 3		**20**
342-323A	Mammalian Physiology	4
342-330A	Fundamentals of Nutrition	3
360-310A,B	Statistical Methods I	3
382-345D	Food Service Systems Management	5
382-322A	Instructional Communications	2
One Elective or Complementary		3
Term 4		**18**
342-424B	Metabolic Endocrinology	3
334-343B	Accounting and Cost Control	3
382-337B	Nutrition Through Life	3
382-310B*	Professional Practice (Stage) in Dietetics Level II a	1
382-311C*	Professional Practice (Stage) in Dietetics Level II b	5
382-344B	Clinical Nutrition I	3
Term 5		**15**
382-436A	Nutritional Assessment	2
382-445A	Clinical Nutrition II	4
382-446A	Personnel Management	3
382-450A	Research Methods in Human Nutrition	3
One Elective or Complementary		3
Term 6		**12**
382-403B	Community Nutrition	3
382-409B*	Professional Practice (Stage) in Dietetics Level III	8
382-438B	Interviewing and Counselling	1
Term 7		**14**
382-410A*	Professional Practice (Stage) in Dietetics Level IV	14

Complementary Courses (6 credits)
6 credits of Human Behavioural Science courses chosen from:
382-202B (3) Comparative Cultures and Societies
382-301A (3) Psychology
or equivalent courses from another faculty.

Electives (6 credits)
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.

333-200A	(3)	Introduction to Food Science
334-200A	(3)	Principles of Microeconomics
344-202B	(3)	Cellular Biology
348-330A	(3)	Academic and Scientific Writing
354-306A	(3)	Français Aliments
382-406A	(3)	Ecology of Human Nutrition
382-420A	(3)	Food Toxicants and Health Risks
382-430A,B	(3)	Directed Studies in Dietetics/Nutrition I
382-451A	(3)	Nutrition Research
382-501A	(3)	Nutrition in Developing Countries
382-512A,B	(3)	Herbs, Foods and Phytochemicals

* Successful completion of all component parts of each level of Professional Practice (Stage) in Dietetics courses is a prerequisite for the next level and must be passed with a minimum grade of C. All required and complementary courses must be passed with a grade of C or better. Undergraduate registration is restricted to students in the Dietetics Major, CGPA greater than or equal to 2.5. Visiting students must contact the Academic Advising Coordinator (Dietetics) regarding course registration eligibility.

A compulsory immunization program exists at McGill which is required by the teaching hospitals before they will permit Dietetics students to practice. Students should complete their immunization before arriving at Macdonald. Medical/health documentation must be received prior to commencement of each level of Stage. There are no exceptions possible.

NUTRITION MAJOR

Academic Advising Coordinator: Kristine G. Koski

This Major covers the many aspects of human nutrition and food and gives first, an education in the scientific fundamentals of these disciplines and second, an opportunity to develop specialization in nutritional biochemistry, nutrition and populations or nutrition of food. Graduates normally will continue on to further studies preparing for careers in research, medicine or as specialists in nutrition. Research nutritionists, aside from working as university teachers and researchers, 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 (with C grade as pass) for registration in all required courses in the Nutrition and Dietetics Majors.)
Option Required and Complementary Courses: 12 credits.
Electives: selected in consultation with Academic Adviser, to meet the minimum 90 credit requirement for the degree.

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

		CREDITS
Term 1		**11**
333-211A	Biochemistry I	3
333-212A	Biochemistry Laboratory	2
336-251A	Microcomputer Applications	3
382-214A	Food Fundamentals	3
Term 2		**12**
342-234B	Biochemistry II	3
362-230B	The Microbial World	3
382-207A,B	Nutrition and Health	3
382-217B	Application of Food Fundamentals	3
Term 3		**12**
342-323A	Mammalian Physiology	4
342-330A	Fundamentals of Nutrition	3
360-310A,B	Statistical Methods I	3
382-322A	Instructional Communications	2

Term 4		**9**
342-424B	Metabolic Endocrinology	3
382-337B	Nutrition Through Life	3
382-344B	Clinical Nutrition I	3
Term 5		**8**
382-436A	Nutritional Assessment	2
382-450A	Research Methods in Human Nutrition	3
382-451A	Nutrition Research	3

Additional required and complementary courses, 12 credits.

Students must select one of the following three options as part of their program.

			CREDITS
Nutritional Biochemistry Option:			**12**
Term 5	342-552A	Protein Metabolism in Animals	3
Term 6	342-551B	Carbohydrate and Lipid Metabolism	3
Term 3 or 5	338-303A	Advances in Atomic and Nuclear Science	3
Term 4 or 6	338-405B	Elementary Tracer Techniques	3
Nutrition and Populations Option:			**12**
Select 6 credits from those listed below or any other social science courses:			6
382-301A (3) Psychology			
382-202B (3) Comparative Cultures and Societies			
Term 5	382-406A	Ecology of Human Nutrition	3
Term 6	382-403B	Community Nutrition	3
Nutrition of Food Option:			**12**
Term 2 or 4	333-334B	Analytical Chemistry II	3
Term 4	333-251B	Food Chemistry I	3
Term 5	333-300A	Food Analysis I	3
Term 6	333-315B	Food Analysis II	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 Jacobs Starkey

The six required courses for the Minor provide the nutrition, metabolism and food base required for the student to have a strong fundamental knowledge in human nutrition. Four of the six courses may be completed on either Campus, with the approval of the Adviser for the program. The additional five credits will allow the student to develop a more extensive background in a more specialized area of nutrition (i.e., nutrition and metabolism, cultural and behavioral aspects of nutrition, community and international nutrition).

General Regulations

To obtain a Minor in Human Nutrition, 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: 19 credits.

Complementary Courses: 5 credits, minimum.

		CREDITS
Required Courses:		**16**
342-234B	Biochemistry II	3
342-323A	Mammalian Physiology	4
342-330A	Fundamentals of Nutrition	3
382-214A	Food Fundamentals	3
382-337B	Nutrition Through Life	3

Complementary Courses: **min 8**

one of:

382-207A,B (3) Nutrition and Health
382-307B (3) Human Nutrition

and at least 5 credits chosen from the following list, in consultation with the Academic Adviser for the Minor

382-217B (3) Application of Food Fundamentals
382-436A (2) Nutritional Assessment
382-403B (3) Community Nutrition
382-406A (3) Ecology of Hum an Nutrition
382-450A (3) Research Methods in Human Nutrition
342-551B (3) Carbohydrate and Lipid Metabolism
382-501A (3) Nutrition in Developing Countries

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 available in any given year. Consult departmental listings for full course descriptions and offerings.

5.8 Department of Food Science and Agricultural Chemistry

Macdonald Stewart Building – Room MS1-034
Telephone: (514) 398-7898
Email: foodscience@agradm.lan.mcgill.ca
Website: http://agrenv.mcgill.ca/foodscience/

Professors — WILLIAM D. MARSHALL, JAMES P. SMITH, FREDERIK R. VAN DE VOORT

Associate Professors — INTEAZ ALLI *(CHAIR)*, SELIM KERMASHA, HOSAHALLI RAMASWAMY, BENJAMIN K. SIMPSON,VAROUJAN YAYLAYAN

Assistant Professors — ASHRAF A. ISMAIL

Adjunct Professors — BYONG H. LEE, YASUO KONISHI, JAMES W. MCLAREN, ANDRE MORIN, J.R. JOCELYN PARE

MAJOR IN FOOD SCIENCE

This program is intended for those students interested in the multidisciplinary field of Food Science. The courses are integrated to acquaint the student with food processing, food chemistry, quality assurance, analytical procedures, food products, standards and regulations. The program prepares graduates for employment as scientists in industry or government, in regulatory, research, quality assurance, or product development capacities. Graduates have the academic qualifications for membership in the Canadian Institute of Food Science and Technology 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**
333-200A	Introduction to Food Science	3
333-211A,B*	Biochemistry I	3
333-213A	Analytical Chemistry I	3
333-233B	Physical Chemistry	3
333-251B	Food Chemistry I	3
333-300A	Food Analysis I	3
333-305A	Food Chemistry II	3
333-310A	Post Harvest Fruit & Vegetable Technology	3
333-315B	Food Analysis II	3
333-319B	Food Chemistry III	3
333-330B	Food Processing	3

333-334B	Analytical Chemistry II	3
333-400A	Food Packaging	3
333-410B	Flavour Chemistry	3
333-425B	Principles of Quality Assurance	3
333-495D,N	Food Science Seminar	3
336-251A,B	Microcomputer Applications	3
336-324A	Elements of Food Engineering	3
360-310A,B	Statistical Methods I	3
362-230B	The Microbial World	3
362-442A	Food Microbiology and Sanitation	3
382-207B	Nutrition and Health	3

* Students who have not taken Chemistry 202 at CEGEP must take Organic Chemistry (333-230A,B) as a prerequisite for 333-211.

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

333-212A,B	(2)	Biochemistry Laboratory
333-230A,B	(4)	Organic Chemistry
333-491D,N	(4)	Research Project
333-510B	(3)	Food Hydrocolloid Chemistry
338-301B	(3)	Biothermodynamics
or 338-303A	(3)	Advances in Atomic & Nuclear Science
338-405B	(3)	Tracer Techniques
344-306B	(3)	Biological Instrumentation

5.9 Interdisciplinary Studies

Ecological Agriculture Program
Professor J. Henning
Telephone: (514) 398-7826
Website: http://www.agrenv.mcgill.ca/agrecon/econagr

MINOR IN ECOLOGICAL AGRICULTURE

Academic Adviser: Professor J. Henning

This Minor program is designed to focus on the principles underlying the practice of ecological agriculture and is suitable for students wishing to farm, do extension and government work, and those intending to pursue post graduate studies in this field. The Minor can be associated with existing Major programs in the Faculty, but in some instances it may require more than 90 credits to meet the requirements of both the Major and the Minor.

Students are advised 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 Ecological Agriculture. 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 Ecological Agriculture Minor. The Academic Adviser of the Ecological Agriculture 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 Ecological Agriculture, students must:

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

Required Courses: 9 credits. As for the Certificate in Ecological Agriculture.
Complementary Courses: 15 credits. As for the Certificate in Ecological Agriculture, excepting that only 15 credits of Complementary Courses are taken in total.

Notes: As for the Certificate in Ecological Agriculture.

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 Certificater 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.

			CREDITS
Required Courses:			**9**
330-210B		Agro-Ecological History	3
330-250B		Principles of Ecological Agriculture	3
330-430A		Ecological Agriculture Systems	3
Complementary Courses:			**21**
21 credits chosen from the following, in consultation with the Academic Adviser for Ecological Agriculture			
with at least 3 credits chosen from:			3-6
373-521B	(3)	Soil Microbiology & Biochemstry	
372-490J	(3)	Plan global de fertilisation	
and the remaining credits to be chosen from:			15-18
260-270A	(3)	Ethics and the Environment	
330-435A	(3)	Soil and Water Quality Management	
330-491G	(3)	Co-op Experience	
334-333A	(3)	Resource Economics	
344-205B	(3)	Principles of Ecology	
349-311B	(3)	Ethology	
350-452A	(3)	Biocontrol of Insect Pests	
367-300B	(3)	Cropping Systems	
367-361B	(3)	Pest Management & the Environment	
367-434B	(3)	Weed Biology and Control	
367-460A	(3)	Plant Ecology	
373-331B	(3)	Microbial Ecology	
374-410A	(3)	The Forest Ecosystem	
375-375B	(3)	Issues in Environmental Sciences	
382-512B	(3)	Herbs and Phytochemicals	

Notes:
1) Most courses listed at the 300 level and higher have prerequisites. Although instructors may waive prerequisite(s) in some cases, students are urged to prepare their program of study to ensure that they have met all conditions.
2) Not all courses are available in any given year. Consult departmental listings for full course descriptions and offerings.
3) Students using 330-491G towards the requirements of the Certificate/Minor are limited to an experience on farms or other enterprises that are either organic, biodynamic, or practicing permaculture. The placement must be approved by the academic adviser for the Certificate/Minor.
4) 373-521B is an alternate year course.

GENERAL AGRICULTURAL SCIENCE MAJOR

Professor Antonio DiTommaso
Raymond Building Room R2-020b
Telephone: (514) 398-7851 ext. 7865

The curriculum is designed to provide a general scientific and applied background for modern agriculture without the requirements of a specialized program and to develop an appreciation of applied agriculture in its on-farm environment. Graduates may be

employed in agri-business, agricultural extension and communications, sales and marketing, teaching or farm management.
Required Courses: 39 credits.
Complementary Courses: 40 credits.
Electives: selected in consultation with Academic Adviser, to meet the minimum 90-credit requirement for the degree.

		CREDITS
Required Courses:		**39**
330-495D,N	Seminar and Assignment	2
333-211A,B	Biochemistry I	3
334-200A	Principles of Microeconomics	3
342-250A	Principles of Animal Science	3
344-202B	Cellular Biology	3
352-300B	Communications - Extension Methods	3
356-204A	Genetics	4
360-310A,B	Statistical Methods I	3
362-230B	The Microbial World	3
367-211A	Principles of Plant Science	3
372-210A	Principles of Soil Science	3
373-330A	Insect Biology	3
375-375B	Issues in Environmental Sciences	3
Complementary Courses:		**40**
one of:		4
342-323A (4) Mammalian Physiology		
or 367-353B (4) Plant Structure and Function		
One Production Course in Animal Science		3
One Production Course in Plant Science		3
One additional course in Soil Science		3
One Agricultural Engineering course		3
One additional course in Agricultural Economics		3
plus a minimum of 21 credits chosen in consultation with the Academic Adviser from the 330, 334, 336, 338, 342, 350, 367, 372 and 374 Teaching Units.		21

5.10 Department of Natural Resource Sciences

Macdonald Stewart Building – Room MS3-040
Telephone: (514) 398-7890
Fax: (514) 398-7990
Email: info@nrs.mcgill.ca
Website: http://www.nrs.mcgill.ca

Emeritus Professors — A. CLARK BLACKWOOD, ROGER KNOWLES, ANGUS F. MACKENZIE, ROBERT A. MACLEOD

Professors — NAYANA N. BARTHAKUR, DAVID M. BIRD, WILLIAM H. HENDERSHOT *(CHAIR)*, EDMUND S. IDZIAK, PETER H. SCHUEPP, ROBIN K. STEWART

Associate Professors — BENOIT CÔTÉ, MARK A. CURTIS, GARY B. DUNPHY, JAMES W. FYLES, DAVID J. LEWIS, GUY R. MEHUYS, DONALD F. NIVEN, MANFRED E. RAU, RODGER D. TITMAN

Assistant Professors — BRIAN T. DRISCOLL, CHANTAL HAMEL, TERRY A. WHEELER

Associate Members — WILLIAM D. MARSHALL, GREG T. MATLASHEWSKI

Adjunct Professors — FREDERICK S. ARCHIBALD, KATHLEEN BLANCHARD, GUY BOIVIN, NATHALIE CALERO, TREVOR C. CHARLES, HELENE CHIASSON, RAYMOND L. DESJARDINS, WAYNE FAIRCHILD, CHARLES W. GREER, MAGELLA GUILLEMETTE, PIERRE MINEAU, HENRY R. MURKIN, MARC ST-ARNAUD, NORMAN R. SEYMOUR, REGIS SIMARD, THOMAS G. SMITH, IAN THOMPSON, CHARLES VINCENT, FREDERICK G. WHORISKEY

Emeritus Curator — VERNON R. VICKERY

Curator — C.-G. HSIUNG

Cross-Appointed Professors — PETER BROWN *(GEOGRAPHY AND MCGILL SCHOOL OF ENVIRONMENT)*, LAURIE CHAN *(DIETETICS AND HUMAN NUTRITION)*, DONALD L. SMITH *(PLANT SCIENCE)*

APPLIED ZOOLOGY MAJOR

Academic Adviser: Professor T.A. Wheeler

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

Required Courses: 24 credits.
Complementary Courses: 28 or 29 credits.
Electives: to meet the minimum requirement of 90 credits; chosen in consultation with the Academic Adviser.

		CREDITS
Required Courses:		**24**
333-211A,B	Biochemistry I	3
333-212A,B	Biochemistry Laboratory	2
344-200A	Biology of Organisms	3
344-202B	Cellular Biology	3
344-205B	Principles of Ecology	3
356-204A	Genetics	4
360-310A,B	Statistical Methods I	3
367-201B	Comparative Plant Biology	3
Complementary Courses:		**28 or 29**
An appropriate Seminar Course		2 or 3
plus a minimum of 26 credits from the following:		26
342-323A	(4) Mammalian Physiology	
349-307A	(3) Natural History of the Vertebrates	
349-308B	(3) Comparative Morphology of the Vertebrates	
349-311B	(3) Ethology	
349-312A	(3) Zoological Systematics and Evolution	
349-313B	(3) Zoogeography	
349-424B	(3) Parasitology	
350-335A	(3) Soil Ecology and Management	
373-330A	(3) Insect Biology	
373-496D,N	(3) Project I	
or 373-497D,N	(5) Project II	
375-401A	(3) Fisheries and Wildlife Management	
375-410B	(3) Wildlife Ecology	
375-420A	(3) Topics in Ornithology	
375-475B	(3) Desert Ecology	

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

Department of Biology (Downtown Campus) Courses:

177-307B	(3)	Behavioural Ecology and Sociobiology
177-327A	(3)	Herpetology
177-331A	(3)	Ecology and Behaviour Field Course
177-334E	(3)	Field Course, Applied Tropical Ecology
177-335T	(3)	Marine Mammals
177-336C	(3)	Marine Aquaculture
177-337C	(3)	Ecology and Behaviour of Fishes
177-351B	(3)	The Biology of Invertebrates
177-352B	(3)	Vertebrate Evolution
177-437A	(3)	Advanced Invertebrate Zoology
177-442B	(3)	Marine Biology

MACDONALD SUMMER FIELD SEMESTER: HUMAN IMPACTS ON THE ENVIRONMENT
(Awaiting University Approval)

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

Summer Session Courses: (May 25 - July 31)

373-381L	(3)	Field Research Methods
373-382L	(3)	Ecological Monitoring & Analysis
373-383L	(3)	Land Use: Redesign & Planning
373-384L	(3)	Field Research Project

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

ENVIRONMENTAL BIOLOGY MAJOR

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

		CREDITS
Required Courses:		**29**
333-211A,B	Biochemistry I	3
333-212A,B	Biochemistry Laboratory	2
344-200A	Biology of Organisms	3
344-202B	Cellular Biology	3
344-205B	Principles of Ecology	3
344-495D,N	Environmental Biology Seminar	2
356-204A	Genetics	4
360-310A,B	Statistical Methods I	3
367-201B	Comparative Plant Biology	3
375-375B	Issues in Environmental Sciences	3

Complementary Courses: **30**
a minimum of 30 credits selected from the following list in consultation with the Academic Adviser

338-201A	(3)	Introductory Meteorology
349-307A	(3)	Natural History of the Vertebrates
349-311B	(3)	Ethology
349-313B	(3)	Zoogeography
349-315A	(3)	Science of Inland Waters
360-306A	(3)	Mathematical Methods in Ecology
362-230B	(3)	The Microbial World
367-358A	(3)	Flowering Plant Diversity
367-460A	(3)	Plant Ecology
372-200B	(3)	Introduction to Earth Science
372-210A	(3)	Principles of Soil Science
373-331B	(3)	Microbial Ecology
373-496D,N	(3)	Project
374-410A	(3)	The Forest Ecosystem
374-420B	(3)	Environmental Issues in Forestry
375-333A	(3)	Physical and Biological Aspects of Pollution
375-401A	(4)	Fisheries and Wildlife Management
375-410B	(3)	Wildlife Ecology
375-437B	(3)	Assessing Environmental Impact
375-475B	(3)	Desert Ecology

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

ENVIRONMENTAL FORESTRY MINOR

Academic Adviser: Professor B. Côté

The Minor allows students to specialize in the environmental aspects of forests and forestry. The program will be of particular interest to students in environmental science disciplines wishing to pursue careers in the forest industry; with government organizations regulating forest-based activities such as fibre production, recreation, wildlife management, and conservation; in private consultancy relating to the environmental aspects of forest management; or those wishing to undertake graduate degrees in fields relating to forest ecology. The Minor can be associated with any of the Majors in the Faculty but more than 90 credits may be necessary to meet the course requirements for both the Major and 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 Environmental Forestry. 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 Environmental Forestry Minor. The Academic Adviser of the Environmental Forestry 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 Environmental Forestry, 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: 15 credits.
Complementary Courses: 9 credits.

NOTE: this program is under revision. Please contact the Academic Adviser for the most up-to-date information.

		CREDITS
Required Courses:		**15**
374-300A	Urban Forests and Trees	3
374-311A	Forest Environmental Interpretation	3
374-410A	The Forest Ecosystem	3
374-420B	Environmental Issues in Forestry	3
374-441B	Integrated Forest Management	3

Complementary Courses: **9**
9 credits chosen from the following list in consultation with the Academic Adviser for the Minor

334-333A	(3)	Resource Economics
367-460A	(3)	Plant Ecology
372-326B	(3)	Soil Genesis and Classification
375-310B	(3)	Air Photo and Imagery Interpretation
375-380B	(3)	Law and Land Use Policy
375-401B	(4)	Fisheries and Wildlife Management
375-437B	(3)	Assessing Environmental Impact
177-555L	(3)	Functional Ecology of Trees

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 available in any given year. Consult departmental listings for full course descriptions and offerings.

MICROBIOLOGY MAJOR

Academic Advisers: Professors B.T. Driscoll (U1), E. Idziak (U2), D. Niven (U3)

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

Required Courses: 60 credits.
Electives: to meet the minimum requirement of 90 credits for the degree; chosen in consultation with the Academic Adviser.

		CREDITS
Required Courses:		**60**
333-211A,B	Biochemistry I	3
333-212A,B	Biochemistry laboratory	2
344-200A	Biology of Organisms	3
344-202B	Cellular Biology	3
344-205B	Principles of Ecology	3
349-424B	Parasitology	3
356-204A	Genetics	4
360-310A,B	Statistical Methods I	3
362-200A	Laboratory Methods in Microbiology	3
362-230B	The Microbial World	3
362-337D,N	Frontiers in Microbiology	1
362-341A	Mechanisms of Pathogenicity	3
362-492D,N	Project	5
362-495D,N	Seminar	3
367-201B	Comparative Plant Biology	3
373-331B	Microbial Ecology	3
373-338A	Molecular Biology of Microorganisms	3
373-442A	Food Microbiology and Sanitation	3
391-400B	Eukaryotic Cells and Viruses	3
391-438B	Immunology	3

RESOURCE CONSERVATION MAJOR

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.

		CREDITS
Required Courses:		**25**
333-211A,B	Biochemistry I	3
334-200A	Principles of Microeconomics	3
334-333A	Resource Economics	3
344-205B	Principles of Ecology	3
349-315A	Science of Inland Waters	3
372-200B	Introduction to Earth Science	3
372-210A	Principles of Soil Science	3
375-437B	Assessing Environmental Impact	2
375-491D,N	Seminar	2
Complementary Courses:		**min. 33**
367-201B (3)	Comparative Plant Biology	3
or 367-211A (3)	Principles of Plant Science	
360-310A,B (3)	Statistical Methods I	3
or 189-203A[1] (3)	Principles of Statistics I	
At least two of the following:		6
336-214A (3)	Surveying	
336-217B (3)	Hydrology and Drainage	
or 183-322A[1] (3)	Hydrology	
336-416A (3)	Engineering for Land Development	
338-201A (3)	Introductory Meteorology	
375-333A (3)	Physical and Biological Aspects of Pollution	
At least three of the following:		9 or 10
177-365B[1] (3)	Conservation Biology	
350-335A (3)	Soil Ecology and Management	
360-306A (3)	Mathematical Methods in Ecology	
367-358A (3)	Flowering Plant Diversity	
373-331B (3)	Microbial Ecology	
374-410A (3)	The Forest Ecosystem	
375-401A (4)	Fisheries and Wildlife Management	
At least three of the following:		9
330-435A (3)	Soil and Water Quality Management	
372-315B (3)	Soil Fertility and Fertilizers	
372-326A (3)	Soil Genesis and Classification	
372-331B (3)	Soil Physics	
372-410B (3)	Soil Chemistry	
373-521B (3)	Soil Microbiology and Biochemistry	
At least one of the following:		3
183-210B[1] (3)	Geographical Information Systems	
336-350B (3)	GIS & Biosystems	
375-310B (3)	Air Photo and Imagery Interpretation	

[1] Downtown Campus

Note: Other courses on the Downtown Campus may be equivalent to some required courses; consult the Academic Adviser.

SOIL SCIENCE MAJOR

Academic Adviser: Professor Mehuys

Students Majoring in Soil Science gain an understanding of the nature of soils, in terms of their physical, biological, biochemical, and chemical properties, and of survey and management techniques which promote their sustained fertility, productivity, and conservation. Students may choose to take a specialized orientation related to either soils and crops, or soil and water conservation. The first option is more biologically oriented, while the second is concerned more with resource management and environmental protection. The Soil Science Major qualifies the graduate for membership in l'Ordre des agronomes du Québec and professional agrologist organizations in the other provinces.

Required Courses, 41 credits.
Complementary Courses: 21 - 23 credits, selected from an approved list in consultation with the Academic Adviser –
Soils and Crops Option: 21 credits
Soil Conservation Option 21-23 credits
Electives: to meet the minimum requirement of 90 credits for the degree.

NOTE: this program is under revision. Please contact the Academic Adviser for the most up-to-date information.

		CREDITS
Required Courses:		**41**
334-200A	Principles of Microeconomics	3
334-231B	Economic Systems of Agriculture	3
338-201A	Introductory Meteorology	3
342-250A	Principles of Animal Science	3
360-310A,B	Statistical Methods I	3
362-230B	The Microbial World	3
367-211A	Principles of Plant Science	3
372-200B	Introduction to Earth Science	3
372-210A	Principles of Soil Science	3
372-315B	Soil Fertility and Fertilizers	3
372-326A	Soil Genesis and Classification	3
372-331B	Soil Physics	3
372-410B	Soil Chemistry	3
375-491D,N	Seminar	2

Complementary Courses **21 - 23**
Either the Soils and Crops Option
or the Soil Conservation Option

Soils and Crops Option **21-23**
Nine credits from the following courses: 9
330-430A (3) Ecological Agriculture Systems
367-300B (3) Cropping Systems
367-322B (3) Greenhouse Management
367-331A (3) Field Crops
367-341A,B (1) Horticulture - The Alliums
367-342A,B (1) Horticulture - Perennial Vegetable Crops
367-343A,B (1) Horticulture - Root Crops
367-344A,B (1) Horticulture - Salad Crops
367-345A,B (1) Horticulture - Solanaceous Crops
367-346A,B (1) Horticulture - Temperate Tree Fruits
367-347A,B (1) Horticulture - Small Fruits
367-434B (3) Weed Biology and Control
Four of the following courses:
260-270A (3) Ethics and the Environment
330-435A (3) Soil and Water Quality Management
333-211A,B (3) Biochemistry I
336-251A,B (3) Microcomputer Applications
344-202B (3) Cellular Biology
350-452A (3) Biocontrol of Insect Pests
356-204A (4) Genetics
367-305A (3) Plant Pathology
367-353B (4) Plant Structure and Function
367-358A (3) Flowering Plant Diversity
367-460A (3) Plant Ecology
373-331B (3) Microbial Ecology
373-521B (3) Soil Microbiology and Biochemistry
374-441B (3) Integrated Forest Management

Soil Conservation Option **21**
Three of the following courses: 9
330-250B (3) Principles of Ecological Agriculture
330-430A (3) Ecological Agriculture Systems
330-435A (3) Soil and Water Quality Management
336-217B (3) Hydrology and Drainage
336-416A (3) Engineering for Land Development
373-521B (3) Soil Microbiology and Biochemistry
Four of the following courses: 12
260-270A (3) Ethics and the Environment
336-214A (3) Surveying
336-251A,B (3) Microcomputer Applications
336-330B (3) GIS for Biosystems Management
344-205B (3) Principles of Ecology
373-331B (3) Microbial Ecology
374-410A (3) The Forest Ecosystem
374-441B (3) Integrated Forest Management
375-310B (3) Air Photo and Imagery Interpretation
375-333A (3) Physical & Biological Aspects of Pollution
375-415A (3) Conservation Law
375-437B (3) Assessing Environmental Impact

WILDLIFE BIOLOGY MAJOR

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

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

Required Courses: 34 credits.
Complementary Courses: 26 credits.
Electives: to meet the requirement of 90 credits for the degree.

NOTE: this program is under revision. Please contact the Academic Adviser for the most up-to-date informion.

CREDITS
Required Courses: **34**
333-211A,B Biochemistry I 3
344-200A Biology of Organisms 3
344-205B Principles of Ecology 3
349-307A Natural History of the Vertebrates 3
356-204A Genetics 4
360-310A,B Statistical Methods I 3
367-201B Comparative Plant Biology 3
367-358A Flowering Plant Diversity 3
375-401A Fisheries and Wildlife Management (Prereq: 367-460A) 4
375-410B Wildlife Ecology 3
375-491D,N Seminar or appropriate substitute 2

Complementary Courses: **26**
a minimum of 26 credits selected from the following list in consultation with the Academic Adviser
170-200A (3) The Global Environment
170-201A (3) Society and Environment
170-202B (3) The Evolving Earth
177-203A (3) Knowledge, Ethics and Environment
334-333A (3) Resource Economics
338-201A (3) Introductory Meteorology
342-323A (4) Mammalian Physiology
349-308B (3) Comparative Morphology of the Vertebrates
349-311B (3) Ethology
349-315A (3) Science of Inland Waters
349-424B (3) Parasitology
360-306A (3) Mathematical Methods in Ecology
367-460A (3) Plant Ecology
373-496D,N (3) Project I
or 373-497D,N (5) Project II
374-420B (3) Environmental Issues in Forestry
374-441B (3) Integrated Forest Management
375-375B (3) Issues in Environmental Science
375-382A (3) Fish and Wildlife Propagation
375-415A (2) Conservation Law
375-420A (3) Topics in Ornithology
375-421B (3) Contemporary Wildlife Issues
375-437B (3) Assessing Environmental Impacts
375-475B (3) Desert Ecology
Department of Biology (Downtown Campus) Courses:
177-305B (3) Biodiversity
177-307B (3) Behavioural Ecology and Sociobiology
177-327A (3) Herpetology
177-331A (3) Ecology and Behaviour Field Course
177-334E (3) Field Course, Applied Tropical Ecology
177-335T (3) Marine Mammals
177-336C (3) Marine Aquaculture
177-337C (3) Ecology and Behaviour of Fishes
177-352B (3) Vertebrate Evolution
177-354B (3) Biology of Birds
177-365A (3) Conservation Biology
177-442B (3) Marine Biology
177-470B (3) Lake Management

5.11 Department of Plant Science

Raymond Building – Room R2-019
Telephone: (514) 398-7851
Email: infoplsci@agradm.lan.mcgill.ca
Website: http://www.agrenv.mcgill.ca/plant/plantsci.htm

Emeritus Professors — RALPH H. ESTEY, WILLIAM F. GRANT, W.E. SACKSTON, HOWARD A. STEPPLER

Professors — DEBORAH J. BUSZARD, DONALD L. SMITH, ALAN K. WATSON

Associate Professors — DANIELLE J. DONNELLY, PIERRE DUTILLEUL, MARC FORTIN, SUHA J.-HARE, AJIAMADA C. KUSHALAPPA, DIANE E. MATHER, TIMOTHY C. PAULITZ, SALVATORE A. SPARACE, KATRINE A. STEWART *(CHAIR),* MARCIA J. WATERWAY

Lecturers — ANTONIO DITOMMASO, SERGE LUSSIER, DAVID D. WEES

Associate Member — TIMOTHY A. JOHNS

Adjunct Professors — DIANE L. BENOIT, DANIEL BOISCLAIR, GAETAN BOURGEOIS, MILES R. BULLEN, ODILE CARISSE, DANIEL CLOUTIER, BRUCE E. COULMAN, LIANNE DWYER, SYLVIE JENNI, SHAHROKH KHANIZADEH, JEAN-FRANÇOIS LALIBERTÉ, ANNE LÉGÈRE, CINDY MORRIS, LOUISE O'DONOUGHUE

The Department of Plant Science administers Majors in Botanical Science and Plant Science. A minimum of 90 credits is needed to complete each Major.

BOTANICAL SCIENCE MAJOR

Academic Adviser: Professor M. Waterway

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 will prepare students for continued study or work in the fields of botany, mycology, ecology, or environmental science. The Molecular Option will prepare students for work or advanced study in the rapidly expanding areas of plant molecular biology and biotechnology. These programs can be completed entirely on the Macdonald Campus or one semester can be spent taking courses on the Downtown Campus during the final year. It is recommended that students take organic chemistry prior to entering the program.

Required Courses: 42 credits.
Complementary Courses: 18 credits, selected from an approved list in consultation with the Academic Adviser, taken in either
the Ecology Option,
or the Molecular Option.
Electives: to meet the minimum requirement of 90 credits for the degree.

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

		CREDITS
Required Courses:		**42**
333-211A,B	Biochemistry I	3
344-200A	Biology of Organisms	3
344-202B	Cellular Biology	3
344-205B	Principles of Ecology	3
356-204A	Genetics	4
360-310B	Statistical Methods I	3
367-201B	Comparative Plant Biology	3
367-220A	Introduction to Vascular Plants	1
367-221A	Introduction to Fungi	1
367-353B	Plant Structure and Function	4
367-358A	Flowering Plant Diversity	3
367-458A	Flowering Plant Systemics	3
367-460A	Plant Ecology	3
367-490D,N	Project	3
367-495D,N	Seminar	2

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

Ecology Option: **18**
at least 12 credits must be chosen from the following:

330-250B	(3)	Principles of Ecological Agriculture
349-315A	(3)	Science of Inland Waters
360-306A	(3)	Mathematical Methods in Ecology
373-331B	(3)	Microbial Ecology
374-410A	(3)	The Forest Ecosystem
374-420B	(3)	Environmental Issues in Forestry
375-415A	(2)	Conservation Law
375-437B	(3)	Assessing Environmental Impact
*177-324A	(3)	Ecological Genetics
*177-331A	(3)	Ecology and Behaviour Field Course
*177-334E	(3)	Field course in Applied Tropical Ecology
*177-365A	(3)	Conservation Biology
*177-483B	(3)	Stat. Approaches in Ecology and Evolution
*183-350A	(3)	Ecological Biogeography

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

Molecular Option: **18**
at least 12 credits must be chosen from the following:

333-212A,B	(2)	Biochemistry Laboratory
344-306B	(3)	Biological Instrumentation
356-500A,B	(3)	Plant Molecular Genetics
356-501B	(3)	Plant Molecular Biology and Genetics
362-200A	(3)	Laboratory Methods in Microbiology
362-230B	(3)	Microbial World
367-525B	(3)	Advanced Micropropagation
367-535B	(3)	Plant Breeding
373-338A	(3)	Bacterial Molecular Genetics
391-400B	(3)	Eukaryotic Cells and Viruses
391-501A,B	(3)	Bioinformatics
*177-301A,B	(3)	Laboratory in Molecular and Cellular Biology
*177-303B	(3)	Developmental Biology
*177-333B	(3)	Plant Biotechnology

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

BOTANICAL SCIENCE MAJOR, GENERAL COMPLEMENTARY COURSES:

367-215A	(1)	Orientation in Plant Science
367-304B	(3)	Biology of Fungi
367-305A	(3)	Plant Pathology
367-310A,B	(3)	Plant Propagation
367-434B	(3)	Weed Biology and Control
367-450A,B	(2)	Special Topics Plant Science
367-451A,B	(3)	Special Topics Plant Science
372-210A	(3)	Principles of Soil Science
382-512A,B	(3)	Herbs, Food, and Phytochemicals
*177-555L	(3)	Functional Ecology of Trees

PLANT SCIENCE MAJOR

Academic Adviser: Professor A. Kushalappa

The Plant Science Major involves intensive training in both the basic and applied sciences as they relate to plant science. Graduates are professionally qualified and generally enter agricultural industries, provincial or federal government services, extension, teaching or postgraduate research.

Required Courses: 46 credits

Complementary Courses: 21 credits.

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

		CREDITS
Required Courses:		**46**
333-211A,B	Biochemistry I	3
342-250A	Principles of Animal Science	3
356-204A	Genetics	4
360-310A	Statistical Methods I	3
362-230B	Microbial World	3
367-211A	Principles of Plant Science	3
367-300B	Cropping Systems	3
367-305A	Plant Pathology	3
367-310A	Plant Propagation	3
367-353B	Plant Structure and Function	4
367-358A	Flowering Plant Diversity	3
367-434B	Weed Biology and Control	3
367-495D,N	Seminar	2
372-210A	Principles of Soil Science	3
372-315B	Soil Fertility and Fertilizers	3
Complementary Courses:		**21**
one of:		3
350-452A (3)	Biocontrol of Insect Pests	
373-330A (3)	Insect Biology	
6 credits in economics, accounting or management		6
plus a minimum of 12 credits selected from the following list in consultation with the Academic Adviser.		12
333-310A (3)	Postharvest Fruit & Vegetable Technology	
367-215A (1)	Orientation in Plant Sciences	
367-220A (1)	Introduction to Vascular Plants	
367-221A (1)	Introduction to Fungi	
367-322B (3)	Greenhouse Management	
367-331A (3)	Field Crops	
367-341A,B (1)	Horticulture - the Alliums	
367-342A,B (1)	Horticulture - Perennial Vegetable Crops	
367-343A,B (1)	Horticulture - Root Crops	
367-344A,B (1)	Horticulture - Salad Crops	
367-345A,B (1)	Horticulture - Solanaceous Crops	
367-346A,B (1)	Horticulture - Temperate Tree Fruits	
367-347A,B (1)	Horticulture - Small Fruits	
367-348A,B (1)	Horticulture - the Brassicas	
367-421A (3)	Landscape Plant Materials	
367-460A (3)	Plant Ecology	
367-535B (3)	Plant Breeding	

MINOR IN AGRICULTURAL PRODUCTION

Academic Adviser: Professor S. Sparace

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: 12 credits.

		CREDITS
Required Courses:		**12**
342-250A	Principles of Animal Science	3
367-211A	Principles of Plant Science	3
367-300B	Cropping Systems	3
372-210A	Principles of Soil Science	3
Complementary Courses:		**12**
12 credits chosen from the following list in consultation with the Academic Adviser for the Minor:		
342-450A (3)	Dairy Cattle Production	
342-452B (3)	Beef and Sheep Production	
342-454B (3)	Swine Production	
342-456A (3)	Poultry Production	
367-331A (3)	Field Crops	
367-341A,B (1)	Horticulture - the Alliums	
367-342A,B (1)	Horticulture - Perennial Vegetable Crops	
367-343A,B (1)	Horticulture - Root Crops	
367-344A,B (1)	Horticulture - Salad Crops	
367-345A,B (1)	Horticulture - Solanaceous Crops	
367-346A,B (1)	Horticulture - Temperate Tree Fruits	
367-347A,B (1)	Horticulture - Small Fruits	
367-348A,B (1)	Horticulture - the Brassicas	

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 available in any given year. Consult departmental listings for full course descriptions and offerings.

6 Description of Courses

Courses are listed numerically by prefix. For courses in the following areas, consult listings with the appropriate prefix:

Agricultural and Biosystems Engineering - 336
Animal Science - 342
Biology - 344
Economics - 334
English - 348
Entomology - 350 and 373
Ethics - 260
Extension - 352
Food Science and Agricultural Chemistry - 333
Forest Resources - 374
French - 354
General Agriculture - 330
Genetics - 356
Mathematics - 360
McGill School of Environment - 170
Microbiology - 362 and 373
Natural Resource Sciences - 373
Nutrition and Dietetics - 382
Parasitology - 391
Physics - 338
Plant Science - 367
Renewable Resources - 375
Sociology - 370
Soil Science - 372 and 373
Zoology - 349

All pre- and co-requisites in a course sequence leading to a more advanced course must be successfully completed before registration will be permitted in the advanced course.

The course credit weight appears in parentheses (#) after the name.

- ● Denotes courses not offered in 1999-2000.
- ★ Denotes courses offered only in alternate years.

Environment

170-200A,B THE GLOBAL ENVIRONMENT. (3) A systems approach to study the different components of the environment involved in global climate change: the atmosphere, biosphere, hydrosphere, and lithosphere. The interactions among these components. Their role in global climate change. The human dimension to global change.
Section 51 - Macdonald Campus

170-201A,B SOCIETY AND ENVIRONMENT. (3) An introduction to human societies and their relations with the biophysical environment, focusing on how economy, technology, and institutions combine and interact to give rise to environmental problems. Analytical treatment of key concepts including "carrying capacity", "renewable resources", "environmental equity", and "sustainability", from distinct disciplinary perspectives in the social and life sciences.
Section 51 - Macdonald Campus

170-202A,B THE EVOLVING EARTH. (3) Formation of the earth and the evolution of life. How geological and biological change are the consequence of history, chance, and necessity acting over different scales of space and time. General principles governing the formation of modern landscapes and biotas. Effects of human activities on natural systems.
Section 51 - Macdonald Campus

170-203A,B KNOWLEDGE, ETHICS AND ENVIRONMENT. (3) Introduction to cultural perspectives on the environment: the influence of culture and cognition on perceptions of the natural world; conflicts in orders of knowledge (models, taxonomies, paradigms, theories, cosmologies), ethics (moral values, frameworks, dilemmas), and law (formal and customary, rights and obligations) regarding political dimensions of critical environments, resource use, and technologies.
Section 51 - Macdonald Campus

170-400B ENVIRONMENTAL STUDIES PROJECT. (3)

170-401A ENVIRONMENTAL ANALYSIS. (3)

Ethics

260-270A ETHICS AND THE ENVIRONMENT. (3) Survey of issues and debates in environmental ethics. The challenge posed to human and religious values by the present ecological crisis and some ethical and religious responses to this challenge, Native American spirituality, Eastern and African religions, ecofeminism and liberation theology will be discussed, as will recent environmental debates concerning technology and large scale development projects. Lectures supplemented by guest speakers and audiovisual presentations. **Staff, Faculty of Religious Studies**

Agriculture

330-210B AGRO-ECOLOGICAL HISTORY. (3) (3 lectures) Introduction to the environmental consequences of agriculture through time, relating the cultural diversity of agronomic practices to regionally varied ecological processes. **Professor Duncan**

330-250B PRINCIPLES OF ECOLOGICAL AGRICULTURE. (3) (3 lectures and one 2-seminar.) Historical overview; ecological basis; environmental, nutritional, socio-cultural, economic and international implications; practical examples of soil management, pest and disease control; integrated crop and livestock production and marketing systems; appropriate technology; agronomic, economic, institutional and political opportunities for change. **Staff**

330-411B INTERNATIONAL AGRICULTURE. (3) (3 lectures and 1 conference) A study of the climate, soils and major economic plant and animal species in tropical and sub-tropical regions; cropping and agro-forestry systems; pest and disease problems; soil and water management; environmental, health and nutrition, and economic issues in rural development; energy and technology for developing countries; the role of international aid and development agencies; case studies on various aspects of food and agricultural systems in developing countries will be presented. **Professor Buckland**

330-430A ECOLOGICAL AGRICULTURE SYSTEMS. (3) (2 lectures and 1 conference) (Prerequisite: 330-250B) A detailed examination of a representative range of ecological vegetable, fruit, cash crop and livestock operations using a systems approach. The transition process, and optimal design and management of the operation will be emphasized. The course will include a number of weekend visits. **Staff**

330-435A,B SOIL AND WATER QUALITY MANAGEMENT. (3) (3 lectures and one 3-hour lab.) Management of soil and water systems for sustainability. Cause of soil degredation, surface and groundwater contamination bt agricultural chemicals and toxic pollutants. Human health and safety concerns. Water-table management. Soil and water conservation techniques will be examined with an emphasis on methods of prediction and best management practices. **Professors Madramootoo, Mehuys and Prasher**

330-440B TECHNOLOGY FOR LOW INPUT AGRICULTURE. (3) (2 lectures and one 2-hour seminar) (Prerequisite: 330-430A.) (Restricted enrolment. Preference given to students in the Ecological Agriculture Minor.) Study of appropriate technologies to solve problems specific to sustainable farming in the context of ecological agricultural systems. Low input technology of crop and animal production, processing, storage and marketing for industrialized and non-industrialized countries. **Staff**

330-491G CO-OP EXPERIENCE. (3) A co-op experience program of at least 12 weeks duration. Students will be exposed to the main areas of operation of their employer. The cooperating employer and the Instructor (or designate) will develop an individualized co-op experience for each student. Students will be supervised by staff of their employer who will be in contact with the instructor (or designate). A site visit by the Instructor (or designate), a report by the student's employer and a final written and oral report by the student will form the basis for evaluation. **Professor Buckland**

330-495D,N SEMINAR AND ASSIGNMENT. (2) (1 lecture) Preparation, presentation and discussion of reports upon approved agricultural subjects chosen in consultation with staff members involved in the subject concerned. **Professor DiTommaso**

330-591G BIOTECHNOLOGY PRACTICUM. (3) (Prerequisite: At least one upper level course in the area of biotechnology or molecular biology and permission of the instructor) (Restricted enrollment. Priority will be given to students enrolled in the Certificate in Biotechnology program.) The cooperating employer and the Instructor (or designate) will develop an individualized practicum experience program of at least 12 weeks duration for each student. **Professor Buckland**

Food Science and Agricultural Chemistry

Students should check with their Academic Adviser as to which of the ★(alternate year) courses will be given in 1999-2000.

333-110A INORGANIC CHEMISTRY. (4) (3 lectures and 1-3 hour lab) The course will be a study of the fundamental principles of atomic structure, valence theory and the periodic table. **Professor Ismail**

333-200A INTRODUCTION TO FOOD SCIENCE. (3) (3 lectures) This course enables one to gain an appreciation of the scope of food science as a discipline. Topics include introductions to chemistry, processing, packaging, analysis, microbiology, product development, sensory evaluation and quality control as they relate to food science. **Professor van de Voort**

333-211A,B BIOCHEMISTRY I. (3) (3 lectures) (Prerequisite: 333-230A) Biochemistry of carbohydrates, lipids, proteins, nucleic

acids; enzymes and coenzymes. Introduction to intermediary metabolism. **Professor Ribeiro**

333-212A,B BIOCHEMISTRY LABORATORY. (2) (1 lecture, 1 lab) (Corequisite: 333-211A,B) The laboratory use of ionic strength and pH; the chemical properties of carbohydrates, lipids, proteins and enzymes; the instruction of laboratory techniques such as titration, chromatography, the use of the analytical balance and the pH meter. **Professor Kermasha/Professor Simpson**

333-213A ANALYTICAL CHEMISTRY I. (3) (3 lectures and 1-3 hour lab) Theoretical aspects of wet chemical techniques including gravimetric and volumetric analyses, redoximetry, and separation techniques. **Professor Marshall**

333-230A,B ORGANIC CHEMISTRY. (4) (3 lectures and 1-3 hour lab) Overview of functional groups, modern concepts of bonding, mechanisms, conformational analysis, stereochemistry and reactions of aliphatic compounds. **Professor Yaylayan**

333-233B PHYSICAL CHEMISTRY. (3) (3 lectures) Introduction to kinetic theory, thermodynamics, properties of liquids and solids, chemical equilibrium and the law of mass action, phase rule, properties of solutions, chemical kinetics. **Professor Ismail**

333-251B FOOD CHEMISTRY I. (3 credits; 3 lectures; 1-3 hour lab) (Prerequisite: 333-211A,B) A study of the chemistry and functionality of the major components comprising food systems, such as water, proteins, carbohydrates and lipids. The relationship of these components to food stability will be studied in terms of degradative reactions and processing. **Professor van de Voort**

333-300A FOOD ANALYSIS I. (3 credits; 3 lectures; 1-3 hour lab) (Prerequisite: 333-251B) The theory and methodologies for the analysis of food products for moisture, fat, protein, ash and fibre (proximate analysis). The quantitative aspects of colour measurement and infrared spectroscopy are also developed in relation to the analysis of food systems. **Professor Alli**

333-305A FOOD CHEMISTRY II. (3) (3 lectures; 1-3 hour lab) (Prerequisite: 333-251B) A study of the chemistry and functionality of the minor components comprising food systems, such as enzymes, anthocyanins, carotenoids, additives, vitamins and essential oils. The relationship of these components to food stability in terms of degradative reactions and processing.

Professor Simpson

333-310A POSTHARVEST FRUIT & VEGETABLE TECHNOLOGY. (3) (3 lectures; 1-3 hour lab) The post harvest chemistry and physiology of horticultural crops as they affect quality and marketability, handling methods pre and post harvest, principles and practices in cooling, storage, transportation and packaging.

Professor Ramaswamy

333-315B FOOD ANALYSIS II. (3) (3 lectures; 1-3 hour lab) (Prerequisite: 333-300A) A more detailed treatment on the principal analytical techniques associated with the analysis of carbohydrates, lipids, proteins and vitamin constituents in food systems.

Professor Kermasha

333-319B FOOD CHEMISTRY III. (3) (2 lectures; 1-3 hour lab) (Prerequisite: 333-305A) The relationship between the chemistry of food constituents present in common commodities, such as milk, meat, eggs, cereals, oilseeds etc. and the common processing methodologies associated with their transformation into stable food product. **Professor Smith**

333-330B FOOD PROCESSING. (3) (3 lectures; 1-3 hour lab) (Prerequisite: 333-251B) The principles and practices of food processing with an emphasis on canning, freezing, and dehydration. A survey of the newer methods of food preservation such as irradiation, reverse osmosis etc. **Professor Ramaswamy**

333-334B ANALYTICAL CHEMISTRY II. (3) (3 lectures; 1-3 hour lab) (Prerequisite: 333-213A or equivalent) Theoretical and practical aspects of potentiometric measurements (pH and other ion-selective electrodes), spectrophotometry, atomic absorption spectroscopy and automated chromatography. **Professor Marshall**

333-400A FOOD PACKAGING. (3) (3 lectures; 1-3 hour lab) (Prerequisite: 333-305A) An integrated approach to the materials used for the packaging of food products, considering the physical, chemical and functional characteristics of such materials and their utility, relative to the chemistry of the food system they are designed to enclose and preserve. **Professor Smith**

333-405A PRODUCT DEVELOPMENT. (3) (3 lectures 1-3 hour lab) (Pre/Co-requisite: 333-305A) The chemical, technological and procedural aspects of product development. An understanding of the role and functionality of food ingredients such as acidulants, phosphates, modified starches, gums, emulsifiers, food additives and other functional components in relation to the formulation of food products. **Staff**

333-410B FLAVOUR CHEMISTRY. (3) (3 lectures) (Prerequisite: 333-305A) The chemistry of the flavour constituents of foods, synthesis, modification, extraction and use. **Professor Yaylayan**

333-415A,B DIRECTED STUDIES IN FOOD SCIENCE. (3) (3 lectures) An individualized course of studies under the direction of a member of staff, usually consisting of written report on a selected food science topic based on current literature. **Staff**

333-425B PRINCIPLES OF QUALITY ASSURANCE. (3) (3 lectures) (Prerequisite: 360-310A,B) The principles and practices required for the development, maintenance and monitoring of systems for food quality and food safety. The concepts and practices of Hazard Analysis Critical Control Point; ISO 9000; Total Quality Management; Statistical Sampling Plans, Statistical Process Control; Tools of Quality; Government Regulations. **Professor Alli**

333-491D,N RESEARCH PROJECT. (4) A laboratory oriented research project carried out under the supervision of a faculty member in the Department of Food Science and Agricultural Chemistry. A clear ability for laboratory research is required. **Staff**

333-495D,N FOOD SCIENCE SEMINAR. (3) (2 lectures) Two 20-minute presentations (1 per term) on an assigned or selected topic. The purpose is to research a subject and present to a peer audience the essence of the subject investigated. Development of presentation and communication skills at a professional level is stressed and rapport with the industry will be established through guest speakers. **Professor Smith**

★**333-500B FOOD ENZYMOLOGY.** (3) (3 lectures) (Prerequisite/Corequisite: 333-305A) Enzymes as they pertain to the deteriorative processes, as processing aids and their use as analytical tools in food. **Professor Simpson**

★**333-510B FOOD HYDROCOLLOID CHEMISTRY.** (3) (3 lectures) (Prerequisite: 333-319B. Corequisite: 333-305A) The concepts of colloid chemistry as it applies to food systems. Components such as proteins, gums, carbohydrates, and emulsions are studied in terms of their chemical and physical properties (i.e., rheology, optical characteristics, etc.) and how they can be used to advantage in food systems. **Professor Kermasha**

★**333-519B ADVANCED FOOD PROCESSING.** (3) (3 lectures) (Prerequisite: 333-330B) Advanced technologies associated with food processing studied in more detail. Topics include food irradiation, reverse osmosis, super critical fluid extraction and extrusion.

Professor Ramaswamy

★**333-520A BIOPHYSICAL CHEMISTRY OF FOOD.** (3) (3 lectures) (Prerequisite: 333-233B) This courses will cover recent advances in the application of spectroscopic techniques, including infrared, Raman, near-infrared, circular dichroism, and fluorescence spectroscopy, to the study of biomolecules of relevance to food. Particular emphasis will be placed on the molecular basis of structure-function and structure-functionality relationships.

Professor Ismail

★**333-530A ADVANCED ANALYTICAL CHEMISTRY.** (3) (3 lectures) (Prerequisite: 333-223B) Selected instrumental methodologies including advances in automated chromatography, wide band NMR, chemical sensors, and the application of other spectroscopic techniques to the analysis of food constituents. **Professor Marshall**

333-535A FOOD BIOTECHNOLOGY. (3) (3 lectures) (Prerequisite: 362-230B) Developments in biotechnology as it relates to food production and processing concerning traditional food fermentations as well as novel food biotechnology enzymes, ingredients, genetic engineering, plant tissue culture and developments for microbiological and food analysis. **Professor Lee**

Economics

334-200A PRINCIPLES OF MICROECONOMICS. (3) (3 lectures) The field of economics as it relates to the activities of individual consumers, firms and organizations. Emphasis is on the application of economic principles and concepts to everyday decision making and to the analysis of current economic issues.
Professor Gunjal

334-201B PRINCIPLES OF MACROECONOMICS. (3) (3 lectures) (Prerequisite: 334-200A or equivalent.) The overall economic system, how it works, and the instruments used to solve social problems. Emphasis will be on decision-making involving the entire economic system and segments of it. **Staff**

334-230B ECONOMICS OF MARKETING. (3) (3 lectures) (Prerequisite: 334-200A or equivalent.) Marketing principles and practices, their relationship to the agriculture-food system, and the economic impact on all segments of this system. Emphasis on the application of marketing principles in problem-solving and in developing marketing and communication skills of the individual. **Staff**

334-231B ECONOMIC SYSTEMS OF AGRICULTURE. (3) (3 lectures) (Prerequisite: 334-200A or equivalent.) The structure and organization of Canada's agriculture-food system, the operation, financing, linkages, and functions of its components. Focus to be on management of the various components and the entire system, types of problems confronted now and in the future.
Professor Baker

334-242A MANAGEMENT THEORIES AND PRACTICES. (3) (3 lectures) An introduction to contemporary management theories and practices in organizations of the food sector.
Professor Goldsmith

334-320B ECONOMICS OF AGRICULTURAL PRODUCTION. (3) (3 lectures) (Prerequisite: 334-200A or equivalent.) An intermediate theory course in agricultural economics, dealing with economic concepts as applied to agricultural production and cost functions. Includes theory and application of linear programming as related to production decisions. **Professor Henning**

334-331A FARM BUSINESS MANAGEMENT. (3) (3 lectures) (Prerequisite: 334-200A or equivalent.) Managing a farm business. Topics include: the decision making process, farm business centre and farm records, farm management and economic concepts, farm planning and budgeting, input management (land, capital, labour and time), tax management (farm organization, estate planning, etc.). **Professor Baker**

334-333A RESOURCE ECONOMICS. (3) (Prerequisites: 334-200A or equivalent.) The role of resources in the environment, use of resources, and management of economic resources within the firm or organization. Problem-solving, case studies involving private and public decision-making in organizations are utilized.
Professor Thomassin

334-343B ACCOUNTING AND COST CONTROL. (3) (3 lectures) An introduction to the basic principles and concepts of responsibility accounting and cost control, analysis and utilization of financial statements and control system data for decision making. **Staff**

334-350B AGRICULTURAL FINANCE. (3) (3 lectures) (Prerequisite: 334-331A) The economic study of acquisition and use of capital in agriculture. Topics include: the analysis of financial statements; farm appraisal; investment analysis; risk in financial management; the cost of capital and the role of financial intermediaries serving agriculture; aggregate financing in agriculture. **Professor Baker**

334-425A AGRICULTURAL ECONOMETRICS. (3) (3 lectures) (Prerequisites: 360-310A,B, 334-200A and 334-201B or equivalents.) Concepts and procedures used in defining and estimating econometric models applied in agriculture. Emphasis on application and estimation of single equation models and solutions to problems such as auto-correlation, hetroscedasticity and multicollinearity. Use of dummy variable technique. **Professor Henning**

334-430B AGRICULTURE, FOOD AND RESOURCE POLICY. (3) (3 lectures) (Prerequisites: 334-201B or equivalent, and 334-320A.) Examination of Canadian, North American and international agriculture, food and resource policies, policy instruments, programs and their implications. Economic analysis applied to the underlying principles, procedures and objectives of various policy actions affecting agriculture. **Staff**

334-440A ADVANCED AGRICULTURE AND FOOD MARKETING. (3) (3 lectures) (Prerequisites: 334-201B or equivalent, and 334-320A.) The nature and the economic organization of agricultural and food marketing including the application of economic concepts to problems and procedures, and their impact on Canadian and North American agriculture. Pricing and marketing of principal agricultural products in Canada is examined. **Staff**

334-442B ECONOMICS OF INTERNATIONAL AGRICULTURAL DEVELOPMENT. (3) (3 lectures) (Prerequisites: 334-200A or 334-201B or equivalent.) The course deals with economic aspects of international development with emphasis on the role of food, agriculture and the resource sector in the economy of developing countries. Topics will include, world food analysis, development project analysis and policies for sustainable development. Development case studies will be used. **Professor Gunjal**

334-450B AGRI-BUSINESS MANAGEMENT. (3) (3 lectures) (Prerequisites: 334-230B and 360-310A,B) Management of operations in agribusiness firms. The use of computer models to make decisions on output mix, facility location, expansion, inventory management and production and strategy. **Professor Goldsmith**

334-452B STUDIES IN AGRIBUSINESS. (3) (Open only to U3 students in Agribusiness Management option in Agricultural Economics.) This course integrates subject matter from agricultural economics and management through the use of case studies. Topics include feasibility analyses for new ventures, market research, strategic management decisions, workforce management, and international dimensions of agribusiness. Students will prepare written and oral presentations of individual and group case studies.
Professor Goldsmith

334-491A RESEARCH SEMINAR IN AGRICULTURAL ECONOMICS. (3) (3 lectures) (Prerequisites: 334-201B or equivalent, and 334-320A.) The nature, methods, and objectives of agricultural economics research concerned with the economic problems affecting the agriculture and food system. Emphasis is on problem identification, and the collection, analysis, and presentation of evidence. Students will present one or more seminars on a research project in agricultural economics. **Professor Thomassin**

334-492A,B SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (3) (Prerequisite: 334-201B or equivalent.) Students will pursue topics that are not otherwise available in formal courses. An individual course of study will be followed under the supervision of a member of the staff qualified in the appropriate discipline or area. **Staff**

334-493D,N SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (3) Presentation and discussion of current problems in agricultural economics by staff and/or special guests. This course is offered on an irregular basis under special circumstances. **Staff**

334-495D,N PROJECT. (3) Under the supervision of a staff member of the Department of Agricultural Economics. Project topic will concern the economics of agriculture, food, or resource development. An agreement between the students and involved staff members must be reached prior to registration. **Staff**

Agricultural and Biosystems Engineering

NOTE: Instructors may refuse registration in a course to any student who does not have, in their opinion, an adequate background in the area.

336-103A,B LINEAR ALGEBRA. (3) (3 lectures and 1 conference) Vectors: equality and inequality, geometric representation, polar form, addition and subtraction, unit vectors, dot product, cross product, triple scaler and vector products, use of vectors in 3-D geometry. Matrices: definition, equality and inequality, addition and subtraction, multiplication, null matrix, identity matrix, triangular and diagonal matrices, determinants, matrix inverse, matrix applications. **Professor Prasher**

336-200B ELEMENTS OF AGRICULTURAL ENGINEERING. (3) (3 lectures and one 2-hour lab) Principles of the engineering infrastructure supporting the symbiotic/parasitic agricultural ecosystem. Topics include the thermodynamic, equipment, systems and environmental considerations of land development, cultivation, drainage and irrigation; soil and water quality conservation; plant and animal production environments; food and feed harvesting, storage and processing; automation, robotics and information systems. **Professor Norris and staff**

336-210A MECHANICS I. (4) (3 lectures and 2 hours lab or problems) Non-concurrent force systems; analysis of simple trusses and multiforce frames; friction, shearing forces and bending moments in beams and frames; centres of gravity; solution of problems by energy methods. **Professor Bonnell**

336-211B MECHANICS II. (4) (3 lectures and 2 hours labs or problems) (Prerequisite: 336-210A) Kinematics, dynamics, energy, momentum, relative motion, the moment of momentum of particles and rigid bodies; the inertia tensor; introduction to vibrations. **Professor Raghavan**

336-212A GRAPHICS. (3) (1 lecture and two 2-hour labs) This is a computer based course taught using personal computer technology. The course content includes principles of engineering drawing, the use of drafting instruments, computer graphics, engineering design, and 2D and 3D drafting with AUTOCAD. **Professor Kok**

★**336-214A SURVEYING.** (3) (2 lectures and one 3-hour lab)The engineer's level and the theodolite are used to perform benchmark circuits, profile levelling, topographic maps and straight line extensions. A total station, computer programs and use of GPS are introduced. **Professor Bonnell**

336-216B MATERIALS SCIENCE. (3) (2 lectures and one 2-hour lab) Relation between structure and properties in ceramic and organic materials. Bonding, structures, imperfections. Phase diagrams. Shaping, joining and testing of materials. Heat treatment, work in hardening and annealing of metals, introduction to physical metallurgy and processes. Failure theories. **Staff**

336-217B HYDROLOGY AND DRAINAGE. (3) (3 lectures, one 2 hour lab) Measurement and analysis of components of the water cycle, and their relation to drainage. Precipitation, mass curves, intensity-duration frequency relationships. Evaporation from lakes, soil and vegetal covers. Interception, infiltration, groundwater, runoff hydrograph components. Estimation of water quantities and water flow rates for design of water control projects. Design of drainage systems. **Professor Madramootoo**

336-251A,B MICROCOMPUTER APPLICATIONS. (3) (3 lectures and one 2-hour lab) A user level computing course oriented toward the use of microcomputers rather than programming. The pros and cons of computerization, network basics, introduction to PC DOS, electronic spreadsheet analysis including graphics, database management including natural language interface, word/text processing and other software packages will be studied. **Professor Kok**

336-252A STRUCTURED COMPUTER PROGRAMMING. (3) (3 lectures and one 2-hour lab) A user level computer programming course in Fortran-90 language. The pros and cons of computerization, differences between mainframe and microcomputers, network basics, discussion of the use of Fortran-90 and C languages to solve engineering problems, electronic spreadsheet analysis and the use of other software packages will be studied from an engineering point of view. **Professor Prasher**

336-301A BIO-THERMODYNAMICS. (3) (3 lectures and one 2-hour lab)The laws of thermodynamics and their application to living systems, including enzyme reactions; introduction to concepts of irreversible thermodynamics; applications of information theory to biological world; diffusion and transport phenomena. **Professor Ngadi**

336-305A FLUID MECHANICS. (4) (3 lectures and one 2-hour lab or problems.) (Prerequisites: 336-211B, 360-202A) Properties of fluids; fluid statics; principles of flow of incompressible and compressible fluids; dimensional analysis boundary layers; conduit and open channel systems; simple applications to turbo machinery. **Professor Raghavan**

336-312B CIRCUIT ANALYSIS. (3) (3 lectures and one 2-hour lab or problems.) (Prerequisite: 360-205B) General circuit laws and d.c. circuits; electromagnetic circuits; inductance and capacitance, natural and forced response of circuits; analysis of single phase and three phase networks; transformers, AC and DC motors/generators. **Professor Sheppard**

336-314B AGRICULTURAL STRUCTURES. (3) (3 lectures and 2-hour lab) Analysis and design of structures to house animals and plants and to process and store animal and plant products. Introduction to environmental control systems and animal waste management. **Professor Barrington**

336-315A DESIGN OF MACHINE ELEMENTS. (4) (3 lectures, 2 hours-problems) (Prerequisite: 336-341B) Design of shafting, bearings, gear, belt and chain drives, clutches, brakes, vibrations, fasteners, welded joints, frames. Principles and practices of Engineering Drawing will be adhered to in laboratory submissions. **Professor McKyes**

336-319A APPLIED MATHEMATICS. (3) (1 lecture, two 2-hour labs) (Prerequisite: 336-252A) This is a computer-based course taught via personal computer technology. The objectives of the course are to familiarize students with a number of computer-based mathematical engineering tools and to teach them how to effectively do mathematics with these. Subjects covered are: data conversion; data modelling and curve fitting; 3D geometry; vector and matrix algebra; filtering and filter design. A number of commercial software produces will be used; these will be updated as the technology evolves. **Professor Landry**

336-322A AGRO-FOOD WASTE MANAGEMENT. (3) (2 lectures and one 2-hour lab) An introduction to engineering aspects of handling, storage and treatment of agricultural and food industry wastes. For all three of these components, design criteria will be elaborated and related to the characteristics of various wastes. Treatments reviewed will discuss physical, chemical and biological systems. **Professor Barrington**

● **336-323A PHYSICAL PROPERTIES OF BIOLOGICAL MATERIALS.** (3) (2 lectures and one 2-hour lab) (Prerequisite: 336-341B)

336-324A ELEMENTS OF FOOD ENGINEERING. (3) (3 lectures) (Pre/co-requisite 333-330B.) (Not open to students in the B.Sc.(Agr.Eng.) program.) A course in basic food engineering for non-engineering students, covering heat transfer, mass and energy balances, food process unit operations, material transport/steam/refrigeration systems. **Professor Sheppard**

336-325A FOOD ENGINEERING. (3) (3 lectures and one 3-hour lab) Heat and mass transfer, enthalpy and mass balances, sterilizing, freezing, fluid flow, pipes, steam, refrigeration, pumps and valves. **Professor Sheppard**

336-330B GIS FOR BIOSYSTEMS MANAGEMENT. (3) (2 lectures and one 2-hour lab) Applications of PC-based Geographic Information Systems (GIS) to the presentation and analysis of natural resources information. Spatial data sources and capture, data structure and analysis and modelling will be reviewed with reference to natural resource management and environmental concerns. **Professors Bonnell and Prasher**

336-341B STRENGTH OF MATERIALS. (4 credits; 3 lectures and one 3-hour lab) (Prerequisite: 336-210A) Stress, strain, resilience, elastic and plastic properties of materials; bending moment and

shear force diagrams; bending and shear stress; deflections; simple, fixed and continuous beams, torsion and helical springs, reinforced concrete beams; columns, bending and direct stress; general case of plane stress; Mohr's circle.
Professor Madramootoo

● **336-411A OFF-ROAD POWER MACHINERY.** (3) (2 lectures and one 3-hour lab) (Prerequisite: 336-211B)

336-412A AGRICULTURAL MACHINERY. (3) (3 lectures and one 3-hour lab) Study and analysis of machines for tillage, harvesting, crop processing and handling. Field tests, load studies, design requirements; design of machines and components for agricultural applications. **Professor Norris**

● **336-416A ENGINEERING FOR LAND DEVELOPMENT.** (3) (3 lectures and one 2-hour lab or design problems) (Prerequisite: 336-217B)

336-418B SOIL MECHANICS AND FOUNDATIONS. (3) (3 lectures and one 3-hour lab) (Prerequisite: 336-341B) The exploration of subsoils, strength theories, granular and cohesive soils, foundation design, settlement calculation, consolidation, slope stability, Atterberg limits, triaxial testing, direct shear testing, compaction, soil freezing, frost heaving. **Professor McKyes**

336-419A STRUCTURAL DESIGN. (3) (3 lectures and one 3-hour lab or design problems) (Prerequisites: 336-341B, 303-213A) Structural Design in steel and timber; application of complete design procedures to working stress design; plastic design for ultimate loading. **Professor Barrington**

336-450B CONSERVING THE NEOTROPICS. (3) (Restricted Enrollment. Location in Panama. Student must be registered for a full semester of studies in Panama) (Prerequisites: 144-218A,B or equivalent; 189-203 or 360-310A or equivalent) Theory and practice in defining environmental Neotropic "problems" and solutions. Indigenous and technical means of meeting environmental challenges. Soil erosion, water scarcity, water over-abundance, and water quality. Explore biodiversity protection via tools such as GIS for decision support. Institutional context of conservation strategies, NGO links, and public participation. **Professors R. Bonnell and T. Meredith**

336-490D,N PROJECT. (3) (1 lecture) Presentation of oral and written reports on approved Agricultural Engineering projects.
Professor Landry

336-491D,N SEMINAR 1. (1) Attendance and participation in departmental seminars. **Professor Landry**

336-492D,N SEMINAR 2. (1) Attendance and participation in departmental seminars. **Professor Landry**

336-493D,N SEMINAR 3. (1) Attendance and participation in departmental seminars. **Professor Landry**

● ★**336-500B ARTIFICIAL INTELLIGENCE FOR BIOSYSTEMS.** (3) (3 lectures and one 2-hour lab) (Prerequisite 335-251A, B or 336-252A)

336-504B INSTRUMENTATION AND CONTROL. (3) (3 lectures and one 2-hour lab) (Prerequisite: 336-312A or 304-281B) Principles and operation of instrument systems used for measurement and control in agricultural processes and research. **Professor Landry**

● **336-506A,B,C ADVANCES IN DRAINAGE MANAGEMENT.** (3) (3 lectures)

336-509A,B HYDROLOGIC SYSTEMS AND MODELLING. (2) Use of deterministic and stochastic models to analyze components of the hydrologic cycle on agricultural and forested watersheds, floods frequency analysis, hydrograph analysis, infiltration, runoff, overland flow, flood routing, erosion and sediment transport. Effects of land-use changes and farm and recreational water management systems on the hydrologic regime. **Professor Madramootoo**

● ★**336-512B SOIL CUTTING, TILLAGE AND TRENCHING.** (3) (2 lectures and one 2-hour lab) (Prerequisite: 336-341B)

● **336-514B DRAIN PIPE AND ENVELOPE MATERIALS.** (3) (3 lectures)

336-515B COMPUTER MODELS IN DRAINAGE ENGINEERING. (3) (3 lectures and one 3-hour lab) A review of computer simulation models for designing subsurface drainage systems. Use of CAD systems in design and drafting drainage plans. In depth discussion and applications of DRAINMOD, a microcomputer based model for designing and evaluating drainage water management systems for soils with high water tables. **Professor Prasher**

● **336-516A PREPARATION AND APPRAISAL OF DRAINAGE PROJECTS.** (3) (3 lectures)

● **336-517A DRAINAGE PROJECT CONTRACTS, INSTALLATION AND MANAGEMENT.** (3) (3 lectures)

★**336-518A POLLUTION CONTROL FOR AGRICULTURE.** (3) (One 3 hour lecture) Special topics concerning control of pollution agents from the agricultural industry; odour control, agricultural waste treatment including biological digestion, flocculants, land disposal and sedimentation, pesticide transport.
Professor Barrington

★**336-525B VENTILATION OF AGRICULTURAL STRUCTURES.** (3) (3 lectures and one 3-hour lab) (Prerequisite 336-301A) The analyses of heat and water vapour transfer through the structure of buildings are used to design heating, ventilation and refrigeration systems. Heat conduction and convection as well as radiation are included in the analysis of heat transfer. Ventilation systems are designed for livestock shelters, produce storages and greenhouses. **Professor Barrington**

★**336-530B ADVANCED FOOD & FERMENTATION ENGINEERING.** (3) (3 lectures and one 3-hour lab) (Prerequisite 336-325 or equivalent.) Advanced topics in food and fermentation engineering are covered, including brewing, bioreactor design and control and microbial kinetics. **Professor Sheppard**

GRADUATE COURSES AVAILABLE TO SENIOR UNDERGRADUATES WITH PERMISSION OF THE INSTRUCTOR.

336-605B FUNCTIONAL ANALYSIS OF MACHINES. (3) (3 lectures) (Prerequisites: 336-211B and 336-323A.) Theoretical analysis of unit operations to be performed by various tillage and harvesting machines, physical and biological properties of the materials affected by the machines. **Professor Norris**

● **336-607B ENGINEERING ASPECTS OF PLANT ENVIRONMENT.** (3) (3 lectures)

● **336-612A SIMULATION AND MODELLING IN AGRICULTURAL ENGINEERING.** (3) (3 lectures)

336-616A,B ADVANCED SOIL AND WATER ENGINEERING. (3) (3 lectures) Derivation of the governing partial differential equations for both steady and unsteady 3-D flow of groundwater through a variably saturated, heterogeneous, anisotropic and deformable medium, finite difference techniques, numerical method of lines (NMOL), computer programs, stochastic methods in soil and water engineering. **Professor Prasher**

The following courses to be taken with the Faculty of Engineering, McGill Downtown Campus. (See the Faculty of Engineering section for descriptions.)

305-346B HEAT TRANSFER. (3) (3 lectures and 1 hour problem)

305-362B MECHANICAL LABORATORY. (2) (3 hour lab)

306-310B ENGINEERING ECONOMY. (3) (3 lectures)

Physics

338-112A INTRODUCTORY PHYSICS I. (4) (3 lectures and one 2-hour lab) Accelerated motion. Newton's Laws. Force, work and energy, power; momentum. Conservation principles. Circular motion. Simple harmonic motion. Waves and sound.
Professor Barthakur

338-114B INTRODUCTORY PHYSICS II. (4) (3 lectures and one 2-hour lab) Electric and magnetic properties of matter: electro-

statics, electric currents, the link between electric and magnetic phenomena, geometrical optics, interference diffraction.
Professor Mehuys

338-201A INTRODUCTORY METEOROLOGY. (3) (3 lectures) The atmosphere – its properties (structure and motion), and thermodynamics (stability, dry and moist). Clouds and precipitation. Air masses and fronts. Radiation and the global radiation budget. Interactions between the atmosphere and the biosphere.
Professor Schuepp

338-303A ADVANCES IN ATOMIC AND NUCLEAR SCIENCE. (3) (3 lectures and 1 conference) Contributions of the 20th century physical sciences towards understanding and investigation of atoms, molecules and nuclei. Classical and quantum-mechanical models. Interaction of matter and radiation. Natural and artificial radioactivity.
Professor Schuepp

338-405B TRACER TECHNIQUES. (3) (3 lectures and one 3-hour lab) (Prerequisite: 338-303A or equivalent.) Operation and theory of various radiation detectors; ionization chambers, G-M counter, proportional counter, solid and liquid scintillation counters, and autoradiography, counting statistics, measurements of environmental radioactivity; practice of radiological safety.
Professor Barthakur

★338-510B AGRICULTURAL MICROMETEOROLOGY. (3) (3 lectures) Interaction between plant communities and the atmosphere. The physical processes governing the transfer of heat, mass and momentum as they relate to research and production in agricultural and environmental systems. Experimental techniques for measuring fluxes of heat, water-vapour, CO_2 and natural and man-made pollutants.
Professor Schuepp

Animal Science

342-234B BIOCHEMISTRY II. (3) (3 lectures and one 3-hour lab) (Prerequisite: 333-211A) Metabolism in humans and domestic animals. The chemistry of alimentary digestion, absorption, transport, intermediary metabolism and excretion.
Professor Ng

342-250A PRINCIPLES OF ANIMAL SCIENCE. (3) (3 lectures and one 2-hour lab) Introduction to the scientific principles underlying the livestock and poultry industries. Emphasis will be placed on the breeding, physiology and nutrition of animals raised for the production of food and fibre.
Professors Wade and Buckland

342-251B COMPARATIVE ANATOMY. (3) (3 lectures and one 3-hour lab) Study of the macroscopic anatomy of mammals based on detailed dissection of the dog. Comparison with other domestic species will be emphasized.
Staff

342-301B PRINCIPLES OF ANIMAL BREEDING. (3) (3 lectures and one 2-hour lab) (Prerequisite: 360-310A,B or equivalent) The qualitative and quantitative aspects of genetics as they apply to the economic improvement of domestic mammals and birds. Topics include: animal domestication, animal cytology, Mendelian traits of economic importance, principles of population genetics, statistical tools to describe populations, environmental effects, selection and mating systems.
Professor Monardes

342-312B ANIMAL PATHOLOGY. (3) (2 lectures and one 2-hour conference) Introductory animal pathology. Includes discussion of causative agents, the development of the disease process, degenerative changes, protective mechanisms, factors influencing spread of disease and the control of disease.
Staff

342-323A MAMMALIAN PHYSIOLOGY. (4) (3 lectures and one 3-hour lab) (Prerequisite: 344-202B or equivalent.) A study of the organization, functions and regulation of various organ systems in mammals. The nervous, endocrine, muscular, cardiovascular, respiratory, urinary, digestive and reproductive systems are discussed.
Staff

342-324A ANIMAL REPRODUCTION. (3) (3 lectures and one 3-hour lab) (Prerequisites: 342-250A, 333-211A and 342-323A) Reproduction in domestic animals integrated with management techniques to improve reproductive efficiency. Laboratory training includes anatomy, semen collection and evaluation, oestrus detection and control, artificial insemination and embryo transfer.
Professor Zadworny

342-330A FUNDAMENTALS OF NUTRITION. (3) (3 lectures) (Prerequisites: 333-211A and 342-234B) A discussion of the nutrients; water, carbohydrates, lipids, proteins, minerals and vitamins, with particular emphasis on their functions in and essentially for the animal organism.
Professors Phillip and Touchburn

342-424B METABOLIC ENDOCRINOLOGY. (3) (3 lectures and one 3-hour lab) (Prerequisite: 342-323A) A detailed study of the endocrine system and its role in the maintenance of homeostasis in higher vertebrates, including the endocrine regulation of energy balance.
Professor Laguë

342-433B ANIMAL NUTRITION. (3) (3 lectures and one 1-hour lab) (Prerequisites: 342-250A and 342-330A) Critical discussion of nutrient utilization by farm animals, an assessment of nutritive value of feeds. Recent developments in nutritional manipulation are discussed.
Professor Phillip

342-450A DAIRY CATTLE PRODUCTION. (3) (3 lectures and one 2-hour lab) (Prerequisite: 342-250A) The application and integration of biological principles of genetics, physiology, nutrition and pathology and of economics and engineering for the maximum production efficiency of milk and meat by dairy cattle. Emphasis on recent developments. Trips to dairy farms and related enterprises included as laboratory work.
Professor Block

342-452B BEEF CATTLE AND SHEEP PRODUCTION. (3) (3 lectures and one 2-hour lab) (Prerequisite: 342-250A) The application and integration of biological principles of genetics, physiology, nutrition and pathology and of economics and engineering for the maximum production efficiency of beef and sheep. Trips to beef and sheep farms and related enterprises will comprise part of the laboratory work.
Professor Phillip

342-454B SWINE PRODUCTION. (3) (3 lectures and one 2-hour lab) (Prerequisite: 342-250A) The application and integration of biological principles of genetics, physiology, nutrition and pathology and of economics and engineering for the maximum production efficiency of swine. Trips to swine farms and related enterprises will comprise part of the laboratory work.
Professor Chavez

342-455A,B SPECIAL TOPICS IN ANIMAL SCIENCE. (3) Topics that are not otherwise available in formal courses. Investigation of a particular topic will be carried out under the supervision of a staff member who has expertise in the area of study chosen by the student.
Staff

342-460B BIOLOGY OF LACTATION. (3) (3 lectures) (Prerequisites: 344-202B or equivalent and 333-211A or equivalent.) An interdisciplinary approach to the study of mammary development, the onset of lactation and its cessation. The course will compare the differences in mammalian species in mammary development from embryological, pre- and post-pubertal and pre- and post-partum aspects. Lactation will be discussed at the cellular and biochemical levels.
Professor Block

342-456A POULTRY PRODUCTION. (3) (3 lectures and one 2-hour lab) (Prerequisite: 342-250A) The application and integration of biological principles of genetics, physiology, nutrition and pathology, and of economics and engineering for the maximum production efficiency of poultry meat and eggs. Trips to poultry farms and related enterprises will comprise part of the laboratory work.
Professor Laguë

342-490D,N PROJECT IN ANIMAL SCIENCE. (3) A project to be completed under the supervision of a staff member of the Department of Animal Science. An agreement between student and the involved staff member must be reached prior to registration.
Professor Buckland

342-495D,N SEMINAR. (2) (1 lecture and 1 lab) Instruction on the preparation, presentation and discussion of critical reviews of topics important to animal agriculture to be followed by student presentation of above reviews.
Professor Buckland

Graduate courses available to undergraduates

342-501B ADVANCED ANIMAL PRODUCTION SYSTEMS. (3)

● **342-504A POPULATION GENETICS IN ANIMALS.** (3)

342-551B CARBOHYDRATE & LIPID METABOLISM. (3)

342-552A PROTEIN METABOLISM AND NUTRITION. (3)

Certain other graduate courses are available to undergraduates by permission. Please consult the Graduate Studies Calendar.

Biology

344-120A GENERAL BIOLOGY. (3) (2 lectures and one 3-hour lab) (Not open to students who have passed Biology 301 at CEGEP.) An introduction to the structure, function and adaptation of plants and animals in the biosphere. **Professor Beech**

344-200A BIOLOGY OF ORGANISMS. (3) (3 lectures and 1 lab) The major taxonomic divisions of living organisms; the Protozoa with special reference to parasitic forms; animal embryology; a survey of the structure and biology of the major phyla, with emphasis on animal parasites and entomology. **Professor Lewis**

344-202B CELLULAR BIOLOGY. (3) (4 lectures) Cellular biology in prokaryotic and eucaryotic cells, including their interaction with viruses. Structure, function and replication of theoretical cell types with the emphasis on structure and structurally related function. Some examples of specialized cells are then provided to illustrate some of the differences between cell types. Some background in biochemistry is required. **Professor Beech**

344-205B PRINCIPLES OF ECOLOGY. (3) (2 lectures and 1 conference) The interactions of organisms and the physical environment. Ecological principles will be discussed at the level of the individual, the population and the community. **Professor Curtis**

344-306B BIOLOGICAL INSTRUMENTATION. (3) (Two 3-hour labs) Physical and chemical methods applied to biology including theory and practice of modern instrumentation as applied to pH, chromatography, spectroscopy, centrifugation, radioactivity and electrophoresis. **Professor Sparace and Staff**

344-495D,N ENVIRONMENTAL BIOLOGY SEMINAR. (2) (1 lecture) Presentation of papers on, and discussion of, topics from the field of environmental biology. **Professor Lewis**

English

There are three types of English courses. Two of them, ESL and EAP courses, have restrictions.

ESL (English as a Second Language) restrictions:
All courses below marked ESL are open to full-time, non-anglophone students. Non-anglophone students who, for a period of more than four years, have attended secondary institutions (high school and CEGEP) where the primary language of instruction was English are not eligible for ESL courses. Students who have taken courses at other post-secondary institutions are not eligible for courses described below which are judged to be equivalent. Equivalent, McGill, ESL courses are mutually exclusive as follows: 348-300 and 128-300; 348-301 and 128-301. Students too weak in English for 348-300 might inquire about the 128-200 and 128-201 courses offered on the Downtown Campus (Faculty of Arts).

EAP (English for Academic Purposes) restrictions:
348-330 requires an entrance placement test (see below), a password, and is limited enrolment (capped). This course is not a remedial writing course, and it is not an English as a Second Language course. For this reason there are entrance requirements. The course is designed to allow students who have strong English language skills, and who have mastered basic writing skills, to develop academic and scientific writing skills. Students who are not sufficiently strong in English for this course might consider the ESL courses described below.

Entrance-Placement tests for ESL and EAP courses are coordinated through the office of the Associate Dean (Academic and Student Affairs). Placement tests will take place during the first regularly scheduled meeting of the class. Passwords will then be issued. Telephone (514) 398-7711 for further information. Quebec ESL students must bring copies of CEGEP transcripts. Students who have taken ESL courses for credit at a college or university other than McGill must also bring copies of transcripts. All ESL and EAP students are required to attend class without fail during their first two weeks in order to retain their places. Places for EAP and ESL courses are assigned on a first come, first served basis.

348-300A,B ESL: HIGH INTERMEDIATE I. (3) (3 hours) (Prerequisite: placement test.) (Restrictions: see above.) Improves proficiency of general writing skills while developing reading, oral and aural skills. Focuses on the structure of the English language and the process required to produce coherent short papers. Emphasis on the English of food, agriculture, and the environment. **Staff**

348-301A,B ESL: HIGH INTERMEDIATE II. (3) (3 hours) (Prerequisite: 348-300 or placement test.) (Restrictions: see above.) A continuation of 300A,B. Further improves proficiency of general writing skills while developing reading, oral and aural skills. Focuses on the structure of the English language and the process required to produce coherent short papers. Emphasis on the English of food, agriculture, and the environment. **Staff**

348-330A,B EAP: FUNDAMENTALS OF ACADEMIC AND SCIENTIFIC WRITING. (3) (3 hours) (Prerequisite: entrance test.) (Restrictions: see above.) The object of the course is to enable students who have previously mastered the basic elements of written English to produce well-written, well-researched, and well-documented scientific papers for an academic audience. **Staff**

Zoology

349-307A NATURAL HISTORY OF THE VERTEBRATES. (3) (Lectures and modules.) Review of higher taxonomic groups of vertebrates and prochordates, emphasizing diagnostic characters evolution and distribution. **TBA**

★ **349-308B COMPARATIVE MORPHOLOGY OF THE VERTEBRATES.** (3) (2 lectures, one 3-hour lab and project.) Morphological adaptations, and evolution, of vertebrates. Differences between vertebrates and invertebrates; embryology, skeletal, muscular, digestive, circulatory, nervous, sensory, endocrine and tegumentary systems. **Staff**

349-311B ETHOLOGY. (3) (2 lectures, one 3-hour lab) Invertebrate and vertebrate behaviour; innate behaviour, learning, motivation, agonistic behaviour, rhythms, social organization, mating systems and communication. **Professors Rau and Titman**

★**349-312A ZOOLOGICAL SYSTEMATICS AND EVOLUTION.** (3) (3 lectures, and assignments.) Introduction to animal taxonomy; "the New Systematics"; species concept; variation; speciation; reproductive isolation; evolution; phylogeny; phenetics: zoological nomenclature; methodology, etc. **Professor Wheeler**

★**349-313B ZOOGEOGRAPHY.** (3) (2 lectures, 1 conference and project) (Prerequisite: 349-312A) Factors affecting the areal, regional and world distribution of animal groups and species, with particular reference to the post-mesozoic fauna; related aspects of evolutionary and phylogenetic theory, e.g., adaptation, mimicry, parallel and convergent evolution, Plate Tectonics, climatic and topographical variation, dispersal. **Professor Wheeler**

★**349-315A SCIENCE OF INLAND WATERS.** (3) (2 lectures and one 3-hour lab) (Prerequisite: Any basic Botany or Zoology course.) Nature and history of limnology; divisions of inland waters; properties of fresh water; habitats; zones; nutrient cycles; biota; adaptations; seasonal variation; distributions; pollution; succession and evolution of fresh water environments. Includes field excursions. **Professor Lewis**

349-424B PARASITOLOGY. (3) (2 lectures and one 3-hour lab) Systematics, morphology, biology and ecology of parasitic protozoa, flatworms, roundworms and arthropods with emphasis on economically and medically important species. **Professor Rau**

Entomology

● ★**350-440B SYSTEMATIC ENTOMOLOGY.** (3) (1 lecture, 1 lab and project) (Prerequisite: 373-330A)

350-452A BIOCONTROL OF INSECT PESTS. (3) (3 lectures) Modern concepts of integrated control techniques and principles of insect pest management, with emphasis on biological control (use of predators, parasites and pathogens against pest insects), population monitoring, and manipulation of environmental, behavioral and physiological factors in the pest's way of life. Physical, cultural, and genetic controls and an introduction to the use of non-toxic biochemical controls (attractants, repellents, pheromones, antimetabolites). **Professors Dunphy and Rau**

Graduate courses available to undergraduates with permission:

350-525A INSECT ECOLOGY. (3)

350-535B AQUATIC ENTOMOLOGY. (3)

350-600A,B INSECT PATHOLOGY. (3)

350-610D ADVANCED TAXONOMY AND ZOOLOGY. (3)

Extension Methods

352-300B COMMUNICATIONS - EXTENSION METHODS. (3) (2 lectures and one 2-hour lab) An introductory survey course in communication techniques including journalism skills (news writing, design, etc.), strategies of change, and extension methods (meetings, panel discussions, etc.). **Professor Bird**

French

● **354-306A FRANÇAIS FONCTIONNEL - ALIMENTS ET NUTRITION.** (3) (one 3-hour lecture) (Open to students who already have a good knowledge of French but not open to native speakers.)

● **354-307A FRANÇAIS FONCTIONNEL - AGRICULTURE.** (3) (3-hour lecture) (Open to students who already have a good knowledge of French but not open to native speakers.)

Genetics

356-204A GENETICS. (4) (3 lectures, one 3-hour lab, one 1-hour tutorial.) The course integrates classical, molecular and population genetics of animals, plants, bacteria and viruses. The aim is to understand the flow of genetic information within a cell, within families and in populations. Emphasis will be placed on problem solving based learning. The laboratory exercises will emphasize the interpretation of genetic experimental data. **Professor Fortin**

● **356-500A,B,E TECHNIQUES IN PLANT MOLECULAR GENETICS.** (3)

356-501B PLANT MOLECULAR BIOLOGY AND GENETICS. (3) Photosynthesis, plant development, plant genome mutagenesis and analysis, and plant stress are discussed. Journal articles and reviews on all aspects of plant molecular biology and genetics. **Professor Fortin**

Mathematics

360-101A CALCULUS I. (3) (3 lectures) (Prerequisite: a course in functions.) A review of functions and graphs. Limits, continuity, derivatives. Differentiation of elementary functions. Anti-differentiation. Applications. **Professor Kuhnlein**

360-102B CALCULUS II. (3) (3 lectures) (Prerequisite: Calculus I or equivalent.) Integration, the indefinite and definite integral. Trapezoidal and Simpson's Rule approximations for the integral. Applications to areas between curves, distance, volume, length of a curve, work, area of a surface of revolution, average values, moments, etc. Improper integrals and infinite series. **Professor Hayes**

360-202A CALCULUS. (3) (3 lectures and 1 conference) Partial differentiation; multiple integrals; vector calculus; infinite series; applications. **Professor Barthakur**

360-205B DIFFERENTIAL EQUATIONS. (4) (4 lectures; 1 conference hour) (Prerequisite: 360-202A or equivalent.) Techniques for solution of ordinary 1st and 2nd order equations; power series solutions; systems of equations; introduction to partial differential equations; numerical techniques for solutions; applications to biological, chemical and engineering systems. **Professor Schuepp**

360-306A MATHEMATICAL METHODS IN ECOLOGY. (3) (3 lectures) An introduction to mathematical tools used in building models of biological and ecological systems. These include probability theory, set theory, vector and matrix algebra, differential and difference equations. **Professor Scott**

360-310A,B STATISTICAL METHODS I. (3) (3 lectures and one 2-hour lab) Measures of central tendency and dispersion; normal, student's t, chi square, and F distribution; estimation and testing hypotheses; analysis of variance for simple experimental designs; regression and correlations; binomial and Poisson distribution. **Professor Dutilleul**

360-403C ENVIRONMETRICS STAGE. (3) (Limited enrollment: Registration by application – Deadline December 15; the first seven applications received will have priority.) (Prerequisite: Permission of the instructor based on satisfactory completion of the U2 year of the Environmetrics Domain in the McGill School of Environment) Summer stage of at least four weeks, including a report. Provides students with professional experience in statistical analyses of environmental data. Can be undertaken at federal or provincial research stations and university research laboratories. **Professor Dutilleul**

★**360-411B EXPERIMENTAL DESIGN.** (3) (2 1.5-hour lectures) (Prerequisite: 360-310A,B or equivalent) (Offered in alternate years with 360-414B) General principles of experimental design, incomplete block designs and unbalanced designs, analysis of repeated measures, multivariate and modified univariate analysis of variance, spatial heterogeneity and experimental design, plasticity experiments and genotype-by-environment interaction. (Awaiting University approval) **Professor Dutilleul**

● ★**360-414B TEMPORAL AND SPATIAL STATISTICS.** (3) (2 1.5-hour lectures) (Prerequisite: 360-310A,B or equivalent) (Offered in alternate years with 360-411B)

Graduate courses available to undergraduates by permission:

360-610A STATISTICAL METHODS II. (3) (3 lectures and one 2-hour lab) **Professor Cue**

360-611B EXPERIMENTAL DESIGNS. (3) (3 lectures and 1 conference) **Professor Dutilleul**

★**360-612B MATHEMATICAL METHODS.** (3) (3 hours to be arranged) **Professors Schuepp and Kok**

Microbiology

362-200A LABORATORY METHODS IN MICROBIOLOGY. (3) (Two 3-hour labs) A practical application of techniques relating to morphology and physiology, enrichment, isolation and identification of selected classes of microorganisms. **Professor Idziak**

362-230B THE MICROBIAL WORLD. (3) (3 lectures and one 3-hour lab) The occurrence and importance of microorganisms (especially bacteria) in the biosphere. Principles governing growth, death and metabolic activities of microorganisms. An introduction to the microbiology of soil, water, plants, food, man and animals. **Professor Idziak and Staff**

362-337D,N FRONTIERS IN MICROBIOLOGY. (1) (Irregular meetings) This course involves the preparation of a comprehensive term paper based on a search of the literature on a topic assigned to include an area of recent development new to the student. **Staff**

★**362-341A MECHANISMS OF PATHOGENICITY.** (3) (3 lectures, one 3-hour lab) (Prerequisite: 362-230B) A study of the means by which bacteria cause disease in animals and humans. Includes response of host to invading bacteria, bacterial attachment and penetration processes, and modes of actions of exotoxins and endotoxins. **Professor Niven**

362-492D,N PROJECT. (5) (Equiv. three 3-hour labs) A project involving laboratory work assigned each Microbiology Major student in his or her final year. **Professor Driscoll**

362-495D,N SEMINAR. (3) (Equivalent of 1 lecture) **Professor Niven**

Graduate courses available to undergraduates with permission:

- **362-764A READING AND CONFERENCE.** (3) (2 conferences)
- **362-765B READING AND CONFERENCE.** (3) (2 conferences)

Plant Science

367-201B COMPARATIVE PLANT BIOLOGY. (3) (3 lectures plus 1-hour conference) Comparative study of the ways in which photosynthetic organisms acquire resources, develop and grow, reproduce, and interact with various groups of fungi and herbivores. Comparisons will be made among the following major groups: cyanobacteria, algae, liverworts, mosses, seedless vascular plants, gymnosperms, and angiosperms. **Professor Waterway**

367-211A PRINCIPLES OF PLANT SCIENCE. (3) (3 lectures and one 2-hour lab) A study of major world crop species with emphasis on their adaptation and distribution in relation to the economic botany of the plants. **Professor Watson**

367-215A ORIENTATION IN PLANT SCIENCES. (1) An orientation to selected themes and problems in the pure and applied plant sciences, including crop production, plant ecology and diversity and biotechnology using case-studies based on field and laboratory situations. Offered during the week prior to the start of regular classes and open to all students. Grading, pass/fail. **Professor Paulitz**

367-220A INTRODUCTION TO VASCULAR PLANTS. (1) (Four 4-hour field labs plus project, given during the first 4 weeks of semester) Field survey of different habitats to introduce major groups of vascular plants (ferns, horsetails, clubmosses, gymnosperms, and flowering plants) in natural environments and demonstrate their role in the ecosystem. Emphasis on differences among groups as reflected in their classification. (First 4 weeks of term only). **Professor Waterway**

367-221A INTRODUCTION TO FUNGI. (1) (Four 4-hour field labs, given during the second 4 weeks of semester) Field and laboratory survey of local representatives of the major groups of fungi, including edible and poisonous mushrooms. The role of each group in terrestrial and aquatic ecological niches will be studied with respect to saprophytism, parasitism and symbiosis. Economic important of fungi in medicine and biotechnology will be introduced. (Second 4 weeks of term only.) **Professor J.-Hare**

367-300B CROPPING SYSTEMS. (3) (3 lectures and 1 3-hour lab) (Prerequisite: 367-211A) Application of plant science and soil science to production of agronomic and horticultural crops. Use and sustainability of fertilization, weed control, crop rotation, tillage, drainage and irrigation practices. **Professor Smith**

367-304B BIOLOGY OF FUNGI. (3) (3 lectures and 1 3-hour lab) This course describes the various groups of fungi and explores in depth their biology and physiology, their ecological niches and the role in various ecosystems and their benefits and uses in industry and biotechnology. **Professor Hare**

367-305A PLANT PATHOLOGY. (3) (3 lectures and one 3-hour lab) The theory and concepts of plant pathology, including the disease cycle, infection, symptoms, resistance, epidemiology and control. The biology and taxonomy of pathogens will be studied, including fungi, bacteria, viruses and nematodes. Techniques of inoculation, isolation of pathogens from diseased plants, disease diagnosis and pathogen identification will be demonstrated. **Professors Kushalappa and Paulitz**

- **367-310A PLANT PROPAGATION.** (3) (3 lectures and one 3-hour lab)

367-322B GREENHOUSE MANAGEMENT. (3) (3 lectures and one 3-hour lab) Greenhouse design and operation, including environmental regulation, fertilization and pest management. Focus will be on the production of major floricultural and vegetable crops. **Professor Stewart and Mr. Wees**

367-331A FIELD CROPS. (3) (3 lectures and one 3-hour lab period.) (Prerequisite: 367-211A or 367-201B) (Not open to students who have taken 367-333A and/or 367-332B) A study of economically important field crops (cereals, forages, oilseeds and crops grown for fibre and other industrial products), historical development, botany, distribution and adaptation, cultural practices and factors that affect the utilization of crop products. Laboratories emphasize morphological study of major field crop species. **Professor Smith**

367-341A,B HORTICULTURE - THE ALLIUMS. (1) (Prerequisite: 367-211A or 367-201B or permission of instructor.) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of the Alliums. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professors Buszard and K. Stewart**

367-342A,B HORTICULTURE - PERENNIAL VEGETABLE CROPS. (1) (Prerequisite: 367-211A or 367-201B or permission of instructor.) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of perennial vegetable crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professors Buszard and K. Stewart**

367-343A,B HORTICULTURE - ROOT CROPS. (1) (Prerequisite: 367-211A or 367-201B or permission of instructor.) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of root crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professors Buszard and K. Stewart**

367-344,B HORTICULTURE - SALAD CROPS. (1) (Prerequisite: 367-211A or 367-201B or permission of instructor.) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of salad crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professors Buszard and K. Stewart**

367-345A,B HORTICULTURE - SOLANACEOUS CROPS. (1) (Prerequisite: 367-211A or 367-201B or permission of instructor.) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of the solanaceous crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professors Buszard and K. Stewart**

367-346A,B HORTICULTURE - TEMPERATE TREE FRUITS. (1) (Prerequisite: 367-211A or 367-201B or permission of instructor.) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of temperate zone tree fruits. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professors Buszard and K. Stewart**

367-347A,B HORTICULTURE - SMALL FRUITS. (1) (Prerequisite: 367-211A or 367-201B or permission of instructor.) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of small fruit crops. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professors Buszard and K. Stewart**

367-348A,B HORTICULTURE - THE BRASSICAS. (1) (Prerequiste: 367-211A or 367-201B or permission of instructor) An independent study course in CD ROM format. Modules contain an introductory section on crop establishment and a section dealing with the botany, physiology and management of Brassicas. Students make use of the Internet. Electronic discussion groups are used for tutorials. Grading is through the submission of written assignments. **Professor K. Stewart**

367-353B PLANT STRUCTURE AND FUNCTION. (4) (3 lectures and one 3-hour lab) (Prerequisite: 367-211A or 367-201B.) (Not open to students who have taken 367-252B.) The general anatomy and physiology of vascular plants with emphasis on the cells, tissues, organs and chemical components of plants and the physiological processes associated with their function. **Professor Sparace**

367-358A FLOWERING PLANT DIVERSITY. (3) (2 lectures, one 3-hour lab, plus a 4-day field week held the week preceding the start of classes) (Prerequisites: 367-211A or 367-201B or permission of instructor) Principles of classification and identification of flowering plants and ferns, with emphasis on 35 major families of flowering plants and the habitats in which they grow. **Professor Waterway**

367-361B PEST MANAGEMENT AND THE ENVIRONMENT. (3) (3 lectures) Pests, pest impacts on the global food system and strategies for pest management. Pest management methods, models and programs, and how to reduce pest management impacts on the environment. **Professor Kushalappa**

● **367-421A LANDSCAPE PLANT MATERIALS.** (3) (2 lectures and one 3-hour lab) (Prerequisites: 367-211A or 367-201B)

367-434B WEED BIOLOGY AND CONTROL. (3) (3 lectures and one 3-hour lab) (Prerequisite: 367-211A or 367-201B) A study of the biology of undesirable vegetation as related to the principles of prevention and physical, biological, managerial and chemical control. Emphasis on the environmental impact of the different methods of weed control. **Professor Di Tommaso**

367-445A HORTICULTURE INDUSTRY SYSTEMS SEMINAR. (2) Field trips to selected horticultural industry enterprises on alternate weeks. Each enterprise will be evaluated from production and management points of view. Students will be required to prepare written and oral presentations in seminar sessions between field trips. **Professors Buszard and K. Stewart**

367-450A,B SPECIAL TOPICS IN PLANT SCIENCE I. (2) A course of independent study by the student with the guidance of a professor of recognized competence in the area of the chosen topic. **Staff**

367-451A,B SPECIAL TOPICS IN PLANT SCIENCE II. (3) A course of independent study by the student with the guidance of a professor of recognized competence in the area of the chosen topic. **Staff**

367-458B FLOWERING PLANT SYSTEMATICS. (3) (1 lecture plus one 3-hour lab plus required summer plant collection) (Prerequisite: 367-358A or 177-358A or permission of instructor) Principles and methods of phylogenetic analysis of flowering plants with emphasis on new classification systems resulting from analysis of DNA sequence data. Laboratory sessions will focus on 40 temperate and tropical families not covered in 367-358A as well as on identification techniques for difficult plant families. **Professor Waterway**

367-460A PLANT ECOLOGY. (3) (3 lectures and one 3-hour lab) A study of the major vegetation units; the influence of environmental factors on the evolution, distribution, and succession of plant communities; and on the distribution, form and function of plant species. Methods of ecological analyses. **Professor Di Tommaso**

367-490D,N PROJECT. (3) (1 lecture) Directed study on approved problem requiring both oral and written presentation. **Staff**

367-495D,N. SEMINAR. (2) (1 lab) **Staff**

367-525B ADVANCED MICROPROPAGATION. (3) (One 3-hour lecture) A detailed study of the principles and techniques of plant micro propagation. Includes lectures, laboratories, discussion sessions and visits to local laboratories. Evaluation is based on contribution to discussions, laboratory reports and an individualized project. **Professor Donnelly**

★**367-535B PLANT BREEDING.** (3) Principles and practices of plant breeding, including reproduction of of crop plants; plant hybridization; sources of genetic variation; selection methods used for self- and cross-pollinated crops and for clonally reproduced crops; breeding for diseases and pest resistance; applications of biotechnology in plant breeding. **Professor Mather**

Certain graduate courses are available to undergraduates. Please consult the Graduate Calendar.

Sociology

● **370-242A SOCIAL PROCESSES AND SOCIAL INSTITUTIONS.** (3) (3 lectures)

Soil Science

372-200B INTRODUCTION TO EARTH SCIENCE. (3) (3 lectures, one 3-hour lab) Introductory concepts of geology and geomorphology will be presented including: rocks and minerals, surface deposits, history and structure of the earth. **Professor Hendershot**

372-210A PRINCIPLES OF SOIL SCIENCE. (3) (3 lectures and one 3-hour lab) Origin, development and classification of soils, biology, chemical and physical properties related to crop production, soil conservation and land use. **Professor Hamel**

● ★**372-315B SOIL FERTILITY AND FERTILIZERS.** (3) (3 lectures and one lab) (Prerequisite 372-210A or permission of instructor)

● ★**372-326A SOIL GENESIS AND CLASSIFICATION.** (3) (3 lectures and one 3-hour lab) (Prerequisite: 372-200A or equivalent)

● ★**372-331B SOIL PHYSICS.** (3) (3 lectures and one 3-hour lab)

★**372-410B SOIL CHEMISTRY.** (3) (3 lectures and one lab) (Prerequisite: 372-210A or permission of instructor.) Chemical composition of soils, pH, ion exchange; redox potentials; chemistry of soil pollution. **Professor Hendershot**

Natural Resource Sciences

373-330A INSECT BIOLOGY. (3) (2 lectures and one 2-hour lab) An introduction to insect structure, physiology, development, systematics, evolution, ecology and control. **Professor Dunphy and Staff**

373-331B MICROBIAL ECOLOGY. (3) (Prerequisites: 333-211A and 356-204A) Aspects of microbial ecology and environmental microbiology ecology and environmental microbiology will be studied, emphasizing the underlying microbial genetics and physiology. Microbial interactions, diversity, evolution (the position of microorganisms in the universal phylogenetic tree), and the roles of microbes in biogeochemical cycles, biodegradation, and bioremediation will be discussed. **Professor Driscoll**

373-338A BACTERIAL MOLECULAR GENETICS. (3) (Prerequisites: 356-204A, 344-202B or permission of instructor) Bacterial molcular biology with an emphasis on genetic processes, gene regulation, and metabolism. Laboratory sessions will provide the student with practical experience in the methodology of bacterial genetics and in basic recombinant DNA techniques. **Staff**

373-350A BIOLOGICAL ILLUSTRATION I. (3) (2 lectures, 2 hours research/reading and 2 hours tutorial) Students will be introduced to the art and skills of ink drawing (black and white) which can be applied directly to scientific projects and research, to assist stu-

dents in the preparation and interpretation of published work by operating various scientific equipment, tools and computer programs. **Professor Hsiung**

373-351B BIOLOGICAL ILLUSTRATION II. (3) (2 lectures, 2 hours research/reading and 2 hours tutorial) (Prerequisite: Preference for students with 373-350A or equivalent.) This course is to introduce and develop in students skill in color illustration techniques. Students will learn the combination of different color media – watercolor, color pencils, acrylic and tempera in a scientific subject. Computer programs and print processes in color will also be introduced. Students will acquire knowledge in preparation for conference poster sessions and scientific and educational display. **Professor Hsiung**

373-370A,B,C SPECIAL TOPICS. (1) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area. **Staff**

373-371A,B,C SPECIAL TOPICS. (1) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area. **Staff**

373-372A,B,C SPECIAL TOPICS. (2) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area. **Staff**

373-373A,B,C SPECIAL TOPICS. (2) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area. **Staff**

373-374A,B,C SPECIAL TOPICS. (3) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area. **Staff**

373-375A,B,C SPECIAL TOPICS. (3) Students will pursue topics that are not otherwise available in formal courses. An individualized course of studies will be followed under the supervision of a member of staff qualified in the appropriate discipline or area. **Staff**

The following four courses constitute the Macdonald Summer Field Semester. For more information, consult the McGill Summer Studies Calendar or the Summer Studies website (http://www.mcgill.ca/Summer/).

373-381L FIELD RESEARCH METHODS. (3) Field work and tutorials introduce the principal theories, concepts, tools, and challenges of quantitative and qualitative field research. Includes conceptualization, design methodologies and analysis. Provides the foundation of training for the research project (373-384), introduces potential research topics, and explores the role of participatory action research. (Awaiting University Approval) **Professor Driscoll**

373-382L ECOLOGICAL MONITORING & ANALYSIS. (3) Students use a variety of methods to sample physical, biological and human systems, to analyse and interpret these data to assess ecosytem health. Methods include GIS, population sampling, resource, land use, and biodiversity mapping. (Awaiting University Approval) **Professor Titman**

373-383L LAND USE: REDESIGN & PLANNING. (3) Issues related to historical and modern land use, environmental impacts, current structures of governance. Needs assessment, and the redesign of human systems of organization and decision making according to ecological principles. Land use in peri-urban and rural settings, and the use of participatory action research. (Awaiting University Approval) **Professor Henning**

373-384L FIELD RESEARCH PROJECT. (3) (Pre- or Co-requisite: 373-381L) Students work in small supervised groups to develop and execute a field research project, culminating in a written document and oral presentation. Students are expected to draw upon the skills developed in 373-381. (Awaiting University Approval) **Professor Smith**

373-421B TOPICS IN WILDLIFE CONSERVATION. (3) (3 lectures) Study of current controversial issues focusing on wildlife conservation. Topics include: animal rights, exotic species, ecotourism, urban wildlife, multi-use of national parks, harvesting of wildlife, biological controls, and endangered species. (Awaiting University Approval) **Professor Bird**

373-442A FOOD MICROBIOLOGY AND SANITATION. (3) (3 lectures and 1 3-hour lab)(Prerequisite: 362-230B) Microorganisms, and their products important to the food industry.These will be discussed in terms of production of foods, preservation and processing of foods, facility sanitation and waste disposal, potential for causing food borne disease outbreaks. **Professor Idziak**

373-496D,N PROJECT I. (3) Development of research techniques through selection of problem, formulation of hypotheses and objectives, research design, review of pertinent literature, experimental work, discussion and conclusion of results with oral presentation of completed report, all in consultation with research director. **Professor Wheeler**

373-497D,N PROJECT II. (5) Development of research techniques through selection of problem, formulation of hypotheses and objectives, research design, review of pertinent literature, experimental work, discussion and conclusion of results with oral presentation of completed report, all in consultation with research director. Similar to 373-496D,N, with a more elaborate research program. **Professor Wheeler**

373-520B INSECT PHYSIOLOGY. (3) (Prerequisite: Permission of instructor) Organismal approach to insects, emphasizing the physiology and development, and the physiological relations of insects to their environment. **Professor Dunphy**

★**373-521B SOIL MICROBIOLOGY AND BIOCHEMISTRY.** (3) (Prerequisite: 372-210A) Soil environments, soil microorganisms and their function in the biogeochemical cycles of C, N, P and S. Basics of soil bioremediation. **Professor Hamel**

373-550B VETERINARY AND MEDICAL ENTOMOLOGY. (3) (Prerequisite: Permission of instructor) Environmental aspects of veterinary and medical entomology. An advanced course dealing with the biology and ecology of insects and acarines as aetiological agents and vectors of disease, and their control. Integrated approaches to problem solving. **Professors Rau and Lewis**

373-772A ADVANCED MICROBIAL GENETICS. (3)

373-773B ADVANCED MICROBIAL PHYSIOLOGY. (3)

Forest Resources

374-300A URBAN FORESTS AND TREES. (3) (3 lectures and one 3-hour lab) (Prerequisites: 367-201B and 372-210A) The effects of environmental factors such as soil fertility, soil contamination and compaction, extremes of temperature and air pollutants on trees and forests growing in an urban environment, and means to increase their tolerance will be discussed. Emphasis in the laboratory will be on diagnosis and solving of tree problems in urban environments. **Professor Côté**

● **374-311A FOREST ENVIRONMENTAL INTERPRETATION.** (3) (2 lectures and one 3-hour lab) (Prerequisite: 344-205B or permission of instructor.)

374-410A THE FOREST ECOSYSTEM. (3) (3 lectures and one 3-hour lab) (Prerequisites: 367-201B and 372-210A or permission of instructor.) Interactions among biotic and abiotic components of forests, and their direct and indirect control of productivity and nutrient cycling in forest ecosystems. The laboratory involves a series of 3-hour field trips to local forests during September and October, followed by analysis of data collected. **Professor Fyles**

374-420B ENVIRONMENTAL ISSUES IN FORESTRY. (3) (3 lectures and one 2-hour tutorial) (Prerequisites: 367-201B and 372-210A or permission of instructor.) The science behind current environmental issues relating to forests including the effects of management on productivity and biodiversity, conservation of old-growth forests and endangered species, pesticide use, and industrial pollution. The role of scientific knowledge, relative to social and economic forces, in forest resource decision-making is discussed.
Professor Fyles

374-441B INTEGRATED FOREST MANAGEMENT. (3) (3 lectures and one 3-hour lab) (Prerequisite: 344-205B or permission of instructor.) The study of silviculture and silvics and their application to forest management to sustain the production of wood and other resources such as wildlife, water and landscape in natural forests and rural environments (agroforestry). Acquisition of practical skills in forest survey and computer simulation of forest growth.
Professor Côté

Renewable Resources

● **375-201B RENEWABLE RESOURCES.** (3) (Lectures and modules)

375-333A PHYSICAL AND BIOLOGICAL ASPECTS OF POLLUTION. (3) (3 lectures) The environmental contaminants which cause pollution; sources, amounts and transport of pollutants in water, air and soil; waste management. **Professor Mehuys and Staff**

375-375B ISSUES IN ENVIRONMENTAL SCIENCES. (3) (3 lectures) Principles and trends in global ecology as they pertain to agricultural and natural ecosystems and the impact of environmental change on food production. **Professor Lewis**

● **375-380B LAW AND LAND USE POLICY.** (3) (3 lectures, 3 hours tutorial)

★**375-382A FISH AND WILDLIFE PROPAGATION.** (3) (2 lectures and field trips) (Enrollment limited to 20) An overview of the care and reproduction of wildlife species in captivity for commercial, scientific, conservation, and educatioinal purposes through field trips, lectures, and class discussions. (Awaiting University Approval)
Professor Bird

375-401A FISHERIES AND WILDLIFE MANAGEMENT. (4) (3 lectures, one 2-hour lab and one week field laboratory prior to fall term) Principles of fisheries and wildlife management are considered and current practices of research and management are discussed.
Professors Titman, Bird and Curtis

375-410B WILDLIFE ECOLOGY. (3) (3 lectures, and assignments) Principles of animal ecology as they relate particularly to North American birds and mammals. Topics include: species distribution, population dynamics, predation, geographic speciation, habitat selection and social behaviour. **Professor Scott**

375-415A CONSERVATION LAW. (2) (2 lectures) A study of the various federal, provincial and municipal laws affecting wildlife habitat. Topics include: laws to protect wild birds and animals; the regulation of hunting; legal protection of trees and flowers, sanctuaries, reserves, parks; techniques of acquiring and financing desirable land, property owner rights. **Mr. Marcil**

375-420A TOPICS IN ORNITHOLOGY. (3) (3 lectures and occasional field trips) (Prerequisite: 349-307A or permission of instructor.) Taxonomic relationships and evolution of birds are outlined. Reproduction, migration and population processes of North American birds are examined. **Professors Titman and Bird**

375-437B ASSESSING ENVIRONMENTAL IMPACT. (3) (2 lectures) Theories and procedures of assessing environmental impact. An examination of the environmental impact of existing programs and projects to examine their accuracy in predicting consequences and attenuating undesirable effects. **Staff**

● ★**375-475B DESERT ECOLOGY.** (3) (Field course) (Prerequisites: 367-460A, 349-307A, 375-420A) (Enrolment limited to 20)

375-491D,N SEMINAR. (2) Includes basic lectures on synthesis and interpretation of multifaceted subjects; preparation and publication of one semi-technical article; participation in two oral presentations of technical subjects all under the supervision of academic or staff adviser. **Professors Schuepp and Titman**

Nutrition and Dietetics

✲Successful completion of all components parts of each level of Professional Practice (Stage) in Dietetics is a prerequisite for the next level. All required and complementary courses listed in semesters prior to or with a Stage are prerequisites for that level. Undergraduate registration is restricted to students in the Dietetics Major, CGPA greater than or equal to 2.5. Visiting students contact the Advising Coordinator regarding eligibilty for specific courses.

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

382-200C CONTEMPORARY NUTRITION. (3) (Not open for credit to students with a biology or chemistry course in their program, or to students registered in the School of Dietetics and Human Nutrition, or to students who take 382-207A,B,C.) Provides students without a biology/chemistry background with the fundamental tools to critically assess nutrition related information, to evaluate their own diets, and to implement healthy changes. Emphasis is on current issues and maximizing health and disease prevention at different stages of the lifecycle. **Professor Wykes**

382-202A COMPARATIVE CULTURES AND SOCIETIES. (3) (3 lectures) (Not open to students who have taken 151-202A.) The comparison of human societies at different levels of scale and complexity: hunting bands, horticultural and pastoral tribes, agrarian states and industrial states. Differences in the scale and complexity of social organization and cultural systems and their relation to different modes of subsistence. Offered in cooperation with the Department of Anthropology. **Staff**

382-207A,B NUTRITION AND HEALTH. (3) (3 lectures) A study of the nutrients essential for an adequate diet and ways of meeting these needs. An analysis of some contemporary nutrition problems. This course is suitable for students who wish a course in human nutrition in their program. **Professor Wykes or Kubow**

✲**382-208J PROFESSIONAL PRACTICE (STAGE) IN DIETETICS – LEVEL I.** (4) (Six weeks directed experience: 2 weeks equivalent during the winter and 4 weeks in the summer) Two modules, consisting of 3 weeks directed experience each, in the areas of nutrition and food service administration. Clinical experience to be provided on campus and in participating health and food service centres. **Mrs. Jacobs Starkey**

382-214A FOOD FUNDAMENTALS. (3) (2 lectures and one 4-hour lab) (Prerequisite: 333-230A/B. Corequisite 333-211A/B and 333-212A/B) Study of composition, structure and chemical and physical properties of foods. To understand the scientific principals underlying chemical and physical phenomena that occur during the preparation of food. Laboratory emphasis on developing skills in handling and preparing food, and food assessment by sensory evaluation. **Professor Thibault**

382-217B APPLICATION OF FOOD FUNDAMENTALS. (3) (2 lectures and one 4-hour lab) (Prerequisite, 382-214A) A more intensive study of food and complex food mixtures, including their chemical and physical properties. Learning how to control the changes that take place during the preparation of food to obtain palatable, nutritious and safe food. An introduction to culturally determined food habits. Laboratory emphasis on acquiring new knowledge and application to basic food preparation and cooking principles.
Professor Thibault

382-301A PSYCHOLOGY. (3) (2 lectures and 1 conference) A study of the general characteristics of physical, social, emotional and intellectual development, the psychology of learning, and the growth and development of personality. **Dr. Stojak**

382-307B HUMAN NUTRITION. (3) (3 lectures and 1 project) (Pre- or co-requisites: 177-201, 180-212) (Not open to students who have taken 382-207A,B,C.) Cellular and organismal aspects of nutrition with emphasis on biochemical and physiological roles of carbohydrates, lipids, proteins, minerals and vitamins in disease prevention and promotion of optimum health. **Professor Jones**

✲382-310B PROFESSIONAL PRACTICE (STAGE) IN DIETETICS – LEVEL IIA. (1) (One 2-hour conference/week) Human food intake assessment and evaluation will be practiced including modules on dietary interviewing, nutrition education teaching plans and documentation for the medical record. Practical aspects of health and food service administration will be addressed.

Mrs. Jacobs Starkey

✲382-311C PROFESSIONAL PRACTICE (STAGE) IN DIETETICS – LEVEL IIB. (5) (7 weeks; summer) Two interrelated modules of directed experience in normal and clinical nutrition and foodservice management, in health care settings and the private sector.

Mrs. Jacobs Starkey

382-322A INSTRUCTIONAL COMMUNICATIONS. (2) (2 lectures, 1 lab) (Prerequisite: 382-207B) Instructional communication principles and techniques as applied to individuals and groups; from children to seniors and from non-professionals to professionals. Using nutrition principles, effective public speaking; development and use of audiovisual aids, brochures and handouts; writing for the media; non-verbal communication; giving and receiving feedback; group management techniques will be covered. **M. Lucas and Clinical Coordinators**

382-337B NUTRITION THROUGH LIFE. (3) (3 lectures, 1 conference) (Prerequisite 342-330A) Emphasis on applied quantitative aspects of human nutrition. Nutrient utilization, evaluation and requirements, as related to dietary standards. **Professor Kubow**

382-344B CLINICAL NUTRITION I. (3) (Two 2-hour lectures) (Pre/co-requisite: 342-323A, 382-337B, 342-424B) Clinical nutrition assessment and dietary modification of pathological conditions including hypertension, lipid disorders and cardiovascular disease, obesity, diverticulosis, cancer, COPD, anorexia nervosa and bulimia. **Professor Koski**

382-345D FOOD SERVICE SYSTEMS MANAGEMENT. (5) (2-hour lecture and one 3 to 5-hour lab) (Prerequisite: 382-214A, 382-217B) An introductory course applying the principles of organization and management in the direction of a food service department. Emphasis on establishing standards to control and measure performance of the system and evaluate performance against standards. Students learn quantity food production principles and sanitation and safety regulations involved in operation of a food service establishment. **Professor Bissonnette**

382-361B ENVIRONMENTAL TOXICOLOGY. (3) (3 lectures) Basic principles of environmental toxicology. Effects of pollutants including inorganic ions and anions, metals, hydrocarbons, polychlorinated biphenyls and polychlorodibenzo-p-dioxins, insecticides, herbicides, rodenticides, detergents, organometallic compounds, radioactive isotopes and air pollutants on individual organisms, populations, communities and ecosystems. Paradigms for measurement, evaluation and regulation. **Professor Chan**

382-403B COMMUNITY NUTRITION. (3) (3 hour conference) (Prerequisite: 382-337B) A study of the characteristics and prevention aspects of community health problems. Methods of nutritional assessment, dietary surveys and program planning will be examined. Opportunity to plan a nutrition program for a target population will be provided. **Professor Gray-Donald**

382-406A ECOLOGY OF HUMAN NUTRITION. (3) (3 lectures) (Prerequisite: 382-214A, 342-337B.) (Not open to students who have taken 382-502A,B.) The scientific basis of contemporary food selection for human nutrition; change in North American food availability and use patterns; sociological, behavioural, and economic influences on food choice; topics on the interaction of environment and food availability, quality and consumption.

Professor Kuhnlein

✲382-409B PROFESSIONAL PRACTICE (STAGE) IN DIETETICS – LEVEL III. (8) (Ten weeks) Four interrelated modules of directed experience in clinical nutrition, foodservice management, normal nutrition education and community nutrition, in health care settings and the private sector. **Mrs. Jacobs Starkey**

✲382-410A PROFESSIONAL PRACTICE (STAGE) IN DIETETICS – LEVEL IV. (14) (16 weeks) (Prerequisite 382-409B) Interrelated modules of directed experience in clinical nutrition, foodservice management, normal nutrition education and community nutrition, in health care settings and the private sector.

Mrs. Jacobs Starkey

382-420A FOOD TOXICANTS AND HEALTH RISKS. (3) (3 lectures) (Prerequisite: 333-211A,B) The course provides an overview of the basic principles of food toxicology. The occurrence of health effects of the following toxicants will be discussed; food additives and preservatives; natural toxins in plants and marine foods; food borne molds and mycotoxins, heavy metals and pesticides; and products of food processing. Methods for safety evaluation, risk assessment and basis for current Canadian law and regulatory procedures. **Professor Chan**

382-430A,B DIRECTED STUDIES IN DIETETICS/NUTRITION I. (3) An individualized course of study in dietetics/human nutrition under the supervision of a staff member with expertise on a topic not otherwise available in a formal course. A written agreement between student and staff member must be made before registration and filed with the Program Coordinator. **Staff**

382-431D,N DIRECTED STUDIES IN DIETETICS/NUTRITION II. (3) An individualized course of study in dietetics/human nutrition under the supervision of a staff member with expertise on a topic not otherwise available in a formal course. A written agreement between student and staff member must be made before registration and filed with the Program Coordinator. **Staff**

382-432A,B DIRECTED STUDIES IN DIETETICS/NUTRITION III. (3) An individualized course of study in dietetics/human nutrition under the supervision of a staff member with expertise on a topic not otherwise available in a formal course. A written agreement between student and staff member must be made before registration and filed with the Program Coordinator. **Staff**

382-433A,B,C DIRECTED STUDIES IN DIETETICS/NUTRITION IV. (5) (Prerequisite: registration in 382-409B or equivalent. Restricted to students in the Dietetics Major or documentation of requirement for professional registration.) (Limited enrolment.) An individualized course of study in dietetics and human nutrition not available through other courses in the School. Emphasis will be placed on application of foods and nutrition knowledge, analytic and synthesis skills, and time management. A written agreement between student and instructor must be made before registration. A "C" grade is required to pass the course. **Mrs. Jacobs Starkey**

382-436A NUTRITIONAL ASSESSMENT. (2) (3 lectures) (Prerequisite: 382-214A, 382-217B and 382-337B) Review of literature covering current methodology and information related to the assessment of nutritional status in health and disease. Nutritional and clinical implications of nutrient interactions and how they relate to nutritional status. **Professor Bissonette**

382-438B INTERVIEWING AND COUNSELLING. (1) (One 2-hour conference) (Prerequisite: 382-344B and 382-311C) Techniques and strategies to increase proficiency in interpersonal skills, specifically "helping skills". To review skills used in professional practice in the dietitian's role as communicator, interviewer, counsellor, educator, motivator and behavioral change specialist.

Mrs. Jacobs Starkey

382-445A CLINICAL NUTRITION II. (4) (Two 2-hour lectures, 1 conference) (Prerequisite: 382-344B and 342-424B) Rationale for clinical nutrition intervention for gastrointestinal and liver disease, hypermetabolic states, diabetes mellitus, renal disease and inborn errors of metabolism. Introduction to enteral/parenteral feedings.

Professor Koski

382-446A PERSONNEL MANAGEMENT. (3) (3 lectures, 1 conference) (Prerequisite: 334-242A) The management of people at work. Employee development and the leadership role. The nature of collective bargaining, the role of unions and management. **Staff**

382-450A RESEARCH METHODS IN HUMAN NUTRITION. (3) (2 lectures, 3 hours research, 4 hours other) (Prerequisite: 382-337B, 360-310A/B, 382-344B) Introduction to methods of clinical, community, international, and laboratory-based nutrition research. Lectures, readings and assignments will cover basic research concepts. Students undertake a computer directed literature search and analysis. **Professor Receveur**

382-451A NUTRITION RESEARCH. (3) (Prerequisite: 382-337B. Corequisite: 382-450A) An applied course in analysis and interpretation of nutrition data sets. Introduction to specialized dietary and anthropometric computer programs. Written and oral presentation of results. **Professor Chan**

Graduate courses available to undergraduate students at the U3 level, with permission of instructor. Note: not all graduate courses are offered each year.

382-501A NUTRITION IN DEVELOPING COUNTRIES. (3) (2 lectures and one seminar) (Prerequisite: consent of instructor.) This course will cover the major nutritional problems in developing countries. The focus will be on nutrition and health and emphasize young children and other vulnerable groups. The role of diet and disease for each major nutritional problem will be discussed. **TBA**

● **382-504A,B SENSORY EVALUATION OF FOOD.** (3) (2 lectures, one 3-hour lab) (Prerequisite: a university level course in each of food/ food science and statistics.)

382-511B NUTRITION AND BEHAVIOUR. (3) (2 lectures and one seminar) (Prerequisite: 382-445A for undergraduate students or consent of instructor.) Discussion of knowledge in the area of nutrition and behaviour through lectures and critical review of recent literature; to discuss the theories and controversies associated with relevant topics; to understand the limitations of our knowledge. Topics such as diet and brain biochemistry, stress, feeding behaviour and affective disorders will be included. **Professor Thibault**

382-512A,B HERBS, FOODS AND PHYTOCHEMICALS. (3) (3 lectures and a project.) (Prerequisite: 333-211A,B) An overview of the use of herbal medicines and food phytochemicals and the benefits and risks of their consumption. The physiological basis for activity and the assessment of toxicity will be presented. Current practices relating to the regulation, commercialization and promotion of herbs and phytochemicals will be considered. **Professor Johns**

Parasitology

Professors at the Institute of Parasitology are prepared to supervise students doing undergraduate projects within the Faculty of Agricultural and Environmental Sciences.

391-400B EUKARYOTIC CELLS AND VIRUSES. (3) (4 lectures) (Prerequisite: 356-204A) The basic principles of molecular biology and the underlying molecular basis for various methodologies in molecular biology are covered. The molecular genetic basis for viral infections and tumorigenesis will be covered as examples of the use of molecular genetic approaches to address biological problems. **Professor Matlashewski**

391-410B ENVIRONMENT AND INFECTION. (3) (2 lectures and 2 tutorials) (Prerequisites: 344-200A and 333-211A,B, or equivalents) Infectious agents of humans and animals and their impact on the global environment is considered. The central tenet is that infectious agents are environmental risk factors. The course considers their impact on the human condition and juxtaposes the impact of control and treatment measures and environmental change. **Professor Smith**

391-438B IMMUNOLOGY. (3) (3 lectures) A review of the defense mechanisms of host animals, with particular reference to cell-cell interactions and the regulation of the immune response. The nature of antigens and antibodies, the mechanisms of antibody reactions and hypersensitivity phenomena are also discussed. **Professor Chadee**

391-501A,B BIOINFORMATICS. (3) (2 lectures and 1 laboratory) (Enrollment limited to 16) This course deals with the application of computer software to the fields of molecular biology and biotechnology. Information retrieval from databases available on the internet. Analysis of the primary and secondary structural components of nucleic acids and proteins. Sequence similarity comparisons. Identification of putative function. **Professor Beech**

7 Graduate Programs

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

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

A number of scholarships and student assistantships are available.

A Calendar giving full information regarding graduate courses, theses, registration, etc., is available from the Dean of the Faculty of Graduate Studies and Research (FGSR), McGill University, Montreal, or from the Student Affairs Office, Macdonald Campus of McGill University, Sainte-Anne-de-Bellevue, QC H9X 3V9. A calendar entitled Graduate Fellowships and Awards is also available from the Office of Fellowships and Awards, FGSR, McGill University, Montreal. Information is also available on the FGSR Website (http://www.mcgill.ca/fgsr/).

8 Farm Management and Technology Program

Farm Management and Technology Program
Faculty of Agricultural and Environmental Sciences
P.O. Box 204, Macdonald Campus of McGill
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, Quebec, H9X 3V9
Telephone: (514) 398-7814 Fax: (514) 398-7955
Email: fmt@macdonald.mcgill.ca
Website: http://www.agrenv.mcgill.ca/fmt

Director - Marcel J. Couture

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

The educational goals of the program are: 1) to develop the professional competencies needed to operate and manage an agricultural enterprise; 2) to help the student's integration into professional life; 3) to develop the student's knowledge and learning abilities related to agriculture; 4) to favour professional mobility. The learning methods used are a blend of practical experience on farms, lectures, laboratory experiments, assignments and case studies.

Six (6) academic terms are spent on the Macdonald Campus studying a sequence of courses in Soil, Plant and Animal Science, as well as Engineering, Ecology, Economics and Management. Two summer "stages" or practicums are spent on selected farms

where the student learns the many skills and encounters the many problems related to modern commercial agriculture. Students will also spend time on farms during some of the academic semesters. This will enable them to relate their academic work to the reality of farming. Courses in English, French, Humanities and Physical Education taken during the program will entitle the student to receive a Diplôme d'études collégiales (D.E.C.) from the Ministère de l'Éducation du Québec. The students will also receive a diploma attesting that they have successfully completed the requirements of the Farm Management and Technology Program on the Macdonald Campus of McGill University.

Entrance Requirements

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 requirement is a Quebec High School Leaving Certificate (Secondary V), or its equivalent including Mathematics 436, Physical Sciences 436 and Secondary V English and French courses.
3. Students who graduated from high school before June 1997 are not required to have the courses mentioned above if they enter the program before the year 2000. High school graduation is, however, still required.
4. All candidates for admission must make arrangements to come to the Macdonald Campus for an interview prior to admission to the program.

Admission to this program is in the Fall Semester only.

Academic Standing

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

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

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

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

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

Students have other specific rights and responsibilities that are found in the McGill Student Rights and Responsibilities booklet and in the Macdonald Policy on the Evaluation of Learning.

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 will be charged according to the schedule in effect for all Macdonald Campus students.

Textbooks and Supplies

The cost of textbooks and supplies is estimated at $300 per semester.

Sessional Dates

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

Program Outline

Students take a common core of courses during the first year and then continue into one of the three following streams: 1) Dairy and one choice of Crops; 2) Livestock Production and one choice of Crops; 3) Two Crops. The following Animal and Crop Production courses will be offered when numbers warrant: Dairy, Beef, Swine, Poultry, Cereals and Forages, Industrial Crops, and Horticultural Crops (Vegetables, Fruits and Greenhouse Crops).

REQUIRED COMMON CORE COURSES

General Agriculture
Agricultural Practice, Environment, Health and Safety
Farm Practice 1: School and Professional Life
Farm Practice 2: Integration in the Workplace
Farm Practice 3: Management Skills
Pesticide Use
Agricultural Systems

Agricultural Economics
Introduction to Farm Economics
Farm Accounting
Farm Administration
Farm Budgeting and Analysis
Agricultural Marketing and Policies
Financial Management
Management of Human Resources
Enterprise Management
Farm Planning
Law and Taxation
Farm Project 1
Farm Project 2

Agricultural and Biosystems Engineering
Microcomputing on the Farm
Tools and Machinery Maintenance
Farm Buildings
Tractors and Motors
Building Maintenance
Soil Preparation

Animal Science
Animal Anatomy and Physiology
Introduction to Animal Nutrition

English
English 1
  (B10) English for Farm Management and Technology
English 2
  (A10) Literature
  (A11) Literature & Composition
English 3
  (A20) Literary Genre
English 4
  (A30) Literary Themes

French
Français 1: Communication
Français 2: Communication en Agriculture

Humanities
Humanities 1: Knowledge...Learning...To Be
Humanities 2: World Views and Ethical Issues
Humanities 3: Social and Organizational Issues

Natural Resource Sciences
Soil Fertilization and Amendments
Soil and Water Conservation

Organic Matter Management

Physical Education
Physical Education and Health
Physical Education: Practical
Physical Education in Daily Life

Plant Science
Plant Anatomy and Physiology
Crop Pest Identification

For *each* of the following courses, students must choose one of the following crops: Cereals and Forages; Horticulture (Vegetables, Fruits, and Greenhouse crops).

Crop Establishment 1
Crop Maintenance 1
Harvest and Storage 1
Crop Planning 1

PRODUCTION COURSES
(to be selected according to the student's chosen stream)

Livestock Production
Marketing Strategies
Agricultural Sales
Milking and Milk Quality
Planning of an Animal Feeding Program
Planning Milk Production

For the following *set of courses*, students must choose one of the following animal productions: Dairy; Poultry; Beef; Swine.

Application of an Animal Feeding Program
Introduction to Animal Genetics and Reproduction
Animal and Herd Health
Application of an Improvement Program
Planning of an Animal & Herd Health Program
Planning of an Animal Breeding Program

Crop Production
For *each* of the following courses, students must choose one of the following crop productions: Horticulture (Vegetables, Fruits and Greenhouse Crops) or Industrial Crops.

Marketing Strategies
Agricultural Sales
Applied Plant Propagation
Environmental Control in Greenhouses
Irrigation

The following four courses are only for students who take two sets of Crop Production courses.

Crop Planning 2
Crop Establishment 2
Crop Maintenance 2
Harvest and Storage 2

ELECTIVE COURSES

Students must take 1 or 2 courses to fulfill the 90 and 1/3 credit program requirement depending on their chosen stream. The following elective courses are offered but others can be substituted in consultation with the academic adviser.

Silviculture
Showmanship
Farm Scale Experimentation
Organic Agriculture Techniques

COMPLEMENTARY COURSES

Students must take the following two (2) complementary courses to meet the program requirement:

Ecology
Zoology

ENGLISH EXIT TEST

All students who wish to graduate and obtain a D.E.C. must pass the Uniform English Exit Test that is offered by the M.E.Q.

COMPREHENSIVE ASSESSMENT

The comprehensive assessment has been designed to meet the following objective: to determine whether the student is capable of integrating the different aspects of the program into a coherent farm management plan. The method chosen to achieve this objective is the preparation of a written document and an oral presentation exposing a complete management plan for a farm for a period of 5 years. This assessment is situated in the two Farm Project courses taken by the students in their last two semesters.

9 Instructional Staff

Ahmad, Darakhshan; B.Sc.(Gorakhpur), M.Sc.(Aligarh), M.Sc., Ph.D.(C'dia); Adjunct Professor of Agricultural and Biosystems Engineering

Alli, Inteaz; B.Sc.(Guyana), M.Sc., Ph.D.(McG.); Associate Professor of Food Science and Chair of the Department

Anderson, Susan; B.Sc.(Queen's), B.Sc., M.Sc.(McG); Faculty Lecturer (PT), School of Dietetics and Human Nutrition

Archibald, Frederick, S.; B.Sc.(Acadia), M.Sc.(Dal.), Ph.D.(McG.); Adjunct Professor of Natural Resource Sciences

Babarutsi, Sofia; B.Sc.(Greece), M.Eng., Ph.D.(McG); Assistant Professor (Special Category) of Agricultural and Biosystems Engineering

Baker, Laurence; B.B., M.Sc.(Man.), Ph.D.(McG.); Assistant Professor in Agricultural Economics

Barrington, Suzelle; B.Sc.(Agr.Eng.), Ph.D.(McG.); Associate Professor of Agricultural and Biosystems Engineering

Barthakur, Nayana N.; B.Sc.(Gauh.), M.Sc.(Allahabad), Ph.D.(Sask.); Professor of Agricultural Physics

Beech, Robin N.; B.Sc.(Nottingham), Ph.D.(Edinburgh); Assistant Professor of Parasitology

Benoit, Diane L.; B.Sc.(C'dia), B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(W.Ont.); Adjunct Professor (PT) of Plant Science

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

Bissonnette, David; B.Sc.(F.Sc.)(McG.), Ph.D.(Tor.); Assistant Professor of Dietetics and Human Nutrition

Blackwood, A. Clark; B.Sc., M.Sc.(Alta.), Ph.D.(Wis.), F.R.S.C.; Emeritus Professor of Microbiology

Blais, Jean S.; B.Sc., M.Sc., Ph.D.(McG.); Adjunct Professor of Food Science

Blanchard, Kathleen; B.A.(Peen.), M.S., Ph.D.(C'nell); Adjunct Professor (PT) of Natural Resource Sciences

Block, Elliot; B.S.(C'nell), M.S., Ph.D.(Penn. St.); Professor of Animal Science

Boisclair, Daniel; B.Sc.(Laval), M.Sc., Ph.D.(McG.); Adjunct Professor (PT) of Plant Science

Boivin, Guy; B.Sc., M.Sc.(Montr.), Ph.D.(McG.); Adjunct Professor (PT) of Entomology

Bonnell, Robert B.; B.Sc.(C'dia), B.Sc.(Agr.Eng.), M.Sc., Ph.D.(McG); Assistant Professor of Agricultural and Biosystems Engineering

Bourgeois, Gaetan; B.Sc.(Agr.)(McG.), M.Sc.(Laval), Ph.D.(Flor.); Adjunct Professor (PT) of Plant Science

Britten, Michel; B.Sc., Ph.D.(Laval); Adjunct Professor (PT) of Animal Science

Broughton, Robert S.; B.S.A., B.A.Sc.(Tor.), S.M.(M.I.T.), Ph.D.(McG.), L.L.D.(Dal.); Emeritus Professor of Agricultural and Biosystems Engineering

Buckland, Roger B.; B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(Maryland); Professor of Animal Science

Bullen, Miles R.; B.S.A.(U.B.C.), M.Sc.(McG.), Ph.D.(Wales); Adjunct Professor (PT) of Plant Science

Burrows, Vernon D.; B.S.A., M.Sc.(Man.), Ph.D.(Inst. of Tech., Calif.); Adjunct Professor (PT) of Plant Science

Buszard, Deborah J.I.; B.Sc.(Bath), Ph.D.(Lond.); Dean and Professor of Horticulture

Carisse, Odile; B.Sc., M.Sc., Ph.D.(McG.); Adjunct Professor (PT) of Plant Science

Chadee, Khrisendath; B.Sc.(Wpg.), M.Sc.(Manit.), Ph.D.(McG.); Associate Professor of Parasitology
Chan, Laurie H.M.; B.Sc., M.Phil.(Hong Kong), Ph.D.(London); Assistant Professor of Dietetics & Human Nutrition
Charles, Trevor C.; B.Sc.(U.B.C.), Ph.D.(McM.); Adjunct Professor of Microbiology
Chavez, Eduardo R.; Agr.Eng.(Chile), M.Sc., Ph.D.(Calif.); Professor of Animal Science
Chiasson, Helene; B.Sc.(Qué), M.Sc., Ph.D.(McG.); Adjunct Professor (PT) of Entomology
Cloutier, Daniel; B.Sc.(Laval), M.Sc., Ph.D.(McG.); Adjunct Professor (PT) of Plant Science
Coffin, H. Garth; B.Sc.(Agr.)(McG.), M.S., Ph.D.(Conn.); Associate Professor (PT) of Agricultural Economics
Côté, Benoit; B.Sc., Ph.D.(Laval); Associate Professor of Woodland Resources
Coulman, Bruce; B.S.A., M.Sc.(Sask.), Ph.D.(Man.); Adjunct Professor (PT) Plant Science
Couture, Marcel J.; B.Sc.(Agr.)(McG.), M.Sc.(Guelph); Associate Dean (Community Relations), Faculty Lecturer in Agricultural Economics, and Director, Farm Management and Technology
Cue, Roger I.; B.Sc.(Newcastle-upon-Tyne), Ph.D.(Edin.); Associate Professor of Animal Science
Curtis, Mark; B.Sc., M.Sc., Ph.D.(McG.); Associate Professor of Natural Resource Sciences
Dale, Adam; B.Sc., Ph.D.(Sheff.); Adjunct Professor (PT) of Plant Science
Ditommasso, Antonio; B.Sc.(Agr.)(McG.), M.Sc.(Queen's), Ph.D.(McG.); Faculty Lecturer in Plant Science
Donnelly, Danielle J.; B.Sc.(Agr.)(McG.), M.Sc.(U.B.C.), Ph.D.(S. Fraser); Associate Professor of Plant Science
Downey, Bruce R.; D.V.M.(Tor.), Ph.D.(McG.); Professor of Animal Science
Driscoll, Brian T.; B.Sc., Ph.D.(McMaster); Assistant Professor of Microbiology
Dunphy, Gary B.; B.Sc.(U.N.B.), M.Sc., Ph.D.(Mem.); Associate Professor of Entomology
Dutilleul, Pierre R.; B.Sc., Ph.D.(Belgium); Associate Professor of Statistics
Dwyer, Liane Marie; B.Sc., M.Sc., Ph.D.(Carleton); Adjunct Professor (PT) of Plant Science
Ellyett, William R.; B.A.(Sir G. Wms.), B.Ed.(P.E.)(McG.); Faculty Lecturer, Diploma Program and Director of Athletics
Enright, Peter; B.Sc.(Agr. Eng.)(McG.); Faculty Lecturer, Agricultural and Biosystems Engineering
Estey, Ralph H.; B.Ed.(U.N.B.), M.S.(Maine), D.I.C.(Imp. Coll.), B.Sc.(Agr.), Ph.D.(McG.), F.L.S.; Emeritus Professor of Plant Pathology
Fairchild, Wayne; B.Sc.(Agr.), M.Sc.(McG), Ph.D.(UNB); Adjunct Professor (PT), Natural Resource Sciences
Faubert, Gaétan M.; B.Sc.(Sherbrooke), M.Sc.(Mtl.), Ph.D.(McG.); Professor of Parasitology
Fortin, Marc G.; B.Sc., M.Sc.(Laval), Ph.D.(McG.); Associate Professor of Plant Science and Chair of Department of Plant Science
Fyles, James W.; B.Sc., M.Sc.(Vict.), Ph.D.(Alta.); Associate Professor of Woodland Resources
Georges, Elias; B.Sc., Ph.D.(McG.); Assistant Professor of Parasitology
Goldsmith, Peter D.; B.A.(Kenyon), B.S.(Ohio), M.B.A.(Xavier), M.A.(Ohio), Ph.D.(Ohio); Assistant Professor of Agricultural Economics
Gougeon, Rejeanne; B.Sc.(Laval), M.Sc.(Col.), Ph.D.(Montr.); Assistant Professor (PT) in School of Dietetics and Human Nutrition
Grant, William F.; B.A., M.A.(McM.), Ph.D.(Virginia), F.L.S.; Emeritus Professor of Genetics
Gray-Donald, Katherine; B.Sc., Ph.D.(McG.); Associate Professor of Dietetics and Human Nutrition
Greer, Charles; B.Sc.(Memorial), Ph.D.(McG); Adjunct Professor (PT) of Natural Resource Sciences
Gregorich, Edward; B.Sc., M.Sc.(Sask.), Ph.D.(Guelph); Adjunct Professor (PT) of Natural Resource Sciences
Grenier, Aline; B.Sc., M.Sc.(McG.); Faculty Lecturer in Farm Management and Technology
Guillemette, Magella; B.Sc.(Quebec), Ph.D.(Laval); Adjunct Professor of Natural Resource Sciences
Gunjal, Kisan R.; B.Sc.(Poona), M.Sc.(New Delhi), Ph.D.(Iowa St.); Associate Professor of Agricultural Economics
Hamel, Chantal; B.Sc., Ph.D.(McG.); Assistant Professor of Soil Science
Hayes, J. Flannan; B.Agr.Sc., M.Agr.Sc.(Dub.), Ph.D.(N.C.St.); Professor of Animal Science
Hendershot, William H.; B.Sc.(Tor.), M.Sc.(McG.), Ph.D.(U.B.C.); Professor of Soil Science and Chair of Natural Resource Sciences
Henning, John C.; B.Sc., Ph.D.(Guelph); Associate Professor of Agricultural Economics
Hsuing, George; B.Sc.(Taiwan), B.Ed.(Queen's), Ph.D.(McG.); Curator, Lyman Entomological Museum and Research Laboratory
Hurle, Karl; B.Sc.(Berlin), Ph.D.(Hohenheim); Adjunct Professor (PT) of Plant Science
Idziak, Edmund S.; B.Sc.(Agr.), M.Sc.(McG.), D.Sc.(Delft); Professor of Microbiology and Food Science
Ismail, Ashraf A.; B.Sc., Ph.D.(McG.); Assistant Professor of Food Science and Agricultural Chemistry
Jabaji-Hare, Suha; B.Sc.(AUB), M.Sc.(Guelph), Ph.D.(Waterloo); Associate Professor of Plant Science
Jacobs Starkey, Linda; B.Sc.(H.Ec.)(Mt.St.Vin.), M.Sc.(McG.),FCDA; Faculty Lecturer in Dietetics and Human Nutrition
Jenni, Sylvie; B.Sc.,M.Sc.,Ph.D.(McG); Adjunct Professor (PT), Plant Science
Johns, Timothy A.; B.Sc.(McM.), M.Sc.(U.B.C.), Ph.D.(Mich.).; Associate Professor of Dietetics and Human Nutrition
Jones, Peter J.; B.Sc.(U.B.C.), M.Sc.(U.B.C.), Ph.D.(Tor.).; Professor of Dietetics and Human Nutrition
Kavanagh, Michael J.E.; B.Sc.(Agr.)(McG.); Faculty Lecturer, Farm Management and Technology Program
Kermasha, Selim; B.Sc.(Baghdad), D.Sc.(Nat. Polytech.Inst., Lorraine(Nancy)); Associate Professor of Food Science and Agricultural Chemistry
Khanizadeh, Shahrokh; B.Sc.(Tehran), M.Sc., Ph.D.(McG.); Adjunct Professor (PT) of Plant Science
Knowles, Roger; B.Sc.(Birm.), Ph.D., D.Sc.(Lond.),F.R.S.C.; Emeritus Professor of Microbiology
Kok, Robert; B.E.Sc., Ph.D.(W.Ont.); Professor of Agricultural and Biosystems Engineering
Konishi, Yasuo; B.S.(Shizuoka), M.S., Ph.D.(Tohoku Univ.); Adjunct Professor (PT) of Food Science and Agricultural Chemistry
Koski, Kristine G.; B.S., M.S.(Wash) Ph.D.(Calif.,Davis); Associate Professor of Dietetics and Human Nutrition
Kubow, Stan; B.Sc.(McG.), M.Sc.(Tor.), Ph.D.(Guelph); Associate Professor of Dietetics and Human Nutrition
Kuhnlein, Harriet V.; B.S.(Penn. St.), M.S.(Oregon), Ph.D.(Calif.Berkeley); Professor, School of Dietetics and Human Nutrition and Director, Centre for Nutrition and the Environment of Indigenous Peoples (CINE)
Kuhnlein, Urs; B.Sc.(Fed. Inst. of Tech., Zurich), Ph.D.(Geneva); Professor of Animal Science
Kushalappa, Ajjamada C.; B.Sc., M.Sc.(B'lore), Ph.D.(Flor.); Associate Professor of Plant Science
Lacasse, Pierre; B.Sc.(Laval), M.Sc.(Sherbrooke),Ph.D.(McG); Adjunct Professor of Animal Science
Lacroix, René; B.Sc., M.Sc.(UQAM), Ph.D.(McG.); Assistant Professor (PT) of Animal Science
Laguë, Paul C.; B.A.(Montr.), B.S.A.(Laval), M.S., Ph.D.(C'nell); Associate Professor of Animal Science
Laliberté, Jean-François; B.Sc.(McG.), M.Sc., Ph.D.(Sher.); Adjunct Professor of Plant Science
Landry, Jacques A.; B.Sc.(Agr.Eng.), Ph.D.(McG.); Assistant Professor of Agricultural and Biosystems Engineering
Lazaris-Karatzas, Antoula; B.Sc., Ph.D.(McG.); Adjunct Professor of Animal Science

Lee, Byong H.; B.Sc.(Kangwon), M.Sc.(U.B.C.),M.Sc.(McG.), Ph.D.(Laval); Adjunct Professor (PT) of Food Science and Agricultural Chemistry
Legere, Anne; B.Sc.,M.Sc.(Laval), PhD.(Perdue); Adjunct Professor (PT) in Plant Science
Lewis, David J.; B.Sc., M.Sc., Ph.D.(Mem.); Associate Professor of Entomology
Lucas, Maureen; B.Sc.(F.Sc.),M.Ed.(McG.); Faculty Lecturer (Stage) in Dietetics/Nutrition
Lussier, Serge; B.Sc.(Agr.)(McG.); Assistant Director and Faculty Lecturer Farm Management and Technology
MacKenzie, Angus F.; B.S.A., M.Sc.(Sask.), Ph.D.(C'nell); Emeritus Professor of Soil Science
MacLeod, Robert A.; B.A., M.A.(U.B.C.), Ph.D.(Wis.), F.R.S.C.; Emeritus Professor of Microbiology
Madramootoo, Chandra; B.Sc.(Agr.Eng.), M.Sc., Ph.D.(McG.); Professor of Agricultural and Biosystems Engineering
Marcil, Paul; B.A.(Bishop's), B.F.A.(Conc.), B.C.L., L.L.B.(McG.); Faculty Lecturer (PT) of Natural Resource Sciences
Marshall, Joan; B.A.(McG), M.A.(Tor.), Ph.D.(McG); Adjunct Professor of Agricultural Economics
Marshall, William D.; B.Sc.(U.N.B.), Ph.D.(McM.); Professor of Agricultural Chemistry
Mather, Diane E.; B.Sc.(Agr.)(McG.), M.Sc., Ph.D.(Guelph); Associate Dean (Research and Graduate Studies) and Associate Professor of Plant Science
Matlashewski, Greg J.; B.Sc.(C'dia), Ph.D.(Ottawa); Associate Professor of Parasitology
Matsuno, April; B.Sc., M.Sc.(McG); Faculty Lecturer (Stage), School of Dietetics and Human Nutrition
McKyes, Edward; B.Eng., M.Eng., Ph.D.(McG.); Professor of Agricultural and Biosystems Engineering
Mehuys, Guy R.; B.Sc., Ing.Agron.(Gembloux), Ph.D.(Calif.); Associate Professor of Soil Science
Mineau, Pierre; B.Sc.(McG.), M.Sc., Ph.D.(Queen's); Adjunct Professor (PT) of Natural Resource Sciences
Moffat, Donald; B.Ed.(McG.), Grad Dip in Sports Admin.(C'dia); Faculty Lecturer (PT), Diploma Program and Instructional Coordinator of Athletics
Molgat, Christian; B.Sc.(McG.), B.Sc.(Ottawa); Faculty Lecturer in Farm Management and Technology
Monardes, Humberto G.; B.Sc.(Concepcion, Chile), M.Sc., Ph.D.(Mc.G.); Associate Professor of Animal Science
Morin, J. Andre; B.Sc., M.Sc.(U.ofM.), Ph.D.(McG.); Adjunct Professor (PT) of Food Science and Agricultural Chemistry
Morris, Cindy E.; B.S.(Michigan), Ph.D.(Wisconsin); Adjunct Professor of Plant Science
Moxley, John E.; B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(C'nell), F.A.I.C.; Emeritus Professor of Animal Science
Murkin, Henry R.; B.S.(Man.), M.Sc.(McG.), Ph.D.(Utah St.); Adjunct Professor (PT) of Natural Resource Sciences
Ngadi, Michael O.; B.Eng.(Nigeria), M.A.Sc., Ph.D.(TUNS); Assistant Professor of Agricultural and Biosystems Engineering
Neilson, Helen R.; M.B.E., B.H.S., M.Sc.(McG.), P.Dt.; Emeritus Professor of Food Science
Ng Kwai Hang, Kwet Fane; B.Sc.(Agr.), M.Sc., Ph.D.(McG.); Professor of Animal Science
Niven, Donald F.; B.Sc., Ph.D.(Aber.); Associate Professor of Microbiology
Norris, Eric R.; B.S.A.(Tor.), M.Sc.(Guelph), Ph.D.(Mich. St.); Associate Dean (Academic and Student Affairs) and Associate Professor of Agricultural and Biosystems Engineering
O'Donoughue, Louise; B.Sc., M.Sc.(McG.), Ph.D.(Cambridge); Adjunct Professor of Plant Science
Pare, Jocelyn; B.Sc.(McG.), Ph.D.(Carleton); Adjunct Professor (PT) of Food Science and Agricultural Chemistry
Paulitz, Timothy C.; B.S.(Calif. Poly.) Ph.D.(Calif.); Associate Professor of Plant Science.
Peticlerc, Denis; B.Sc.(Sher.), B.ScA., M.Sc.(Laval), Ph.D.(Mich. St.); Adjunct Professor (PT) of Animal Science
Phillip, Leroy E.; B.Sc.(Agr.), M.Sc.(McG.), Ph.D.(Guelph); Associate Professor of Animal Science
Phillips-Hutchins, Sandra; B.Sc.(F.Sc.)(McG.), B.A.(Queen's); Faculty Lecturer (Stage) of Dietetics and Human Nutrition
Plourde, Hugues; B.Sc.(Nutr.Sci.)(McG.), M.Sc.(Nutr.)(Montr.); Faculty Lecturer in Dietetics and Human Nutrition
Prasher, Shiv O.; B.Tech, M.Tech.(Punjab), Ph.D.(U.B.C.); Professor of Agricultural and Biosystems Engineering
Prichard, Roger K.; B.Sc., Ph.D.(N.S.W.); Professor of Parasitology *(CP Professor of Biotechnology)*
Raghavan, Vijaya G.S.; B.Eng.(Bangalore), M.Sc.(Guelph), Ph.D.(Colo. St.); Professor of Agricultural and Biosystems Engineering and Chair of the Department
Ramaswamy, Hosahalli; B.Sc.(Bangalore), M.Sc.(Mysore), M.Sc., Ph.D.(U.B.C.); Associate Professor of Food Science and Agricultural Chemistry
Rau, Manfred E.; B.Sc., Ph.D.(W.Ont.); Associate Professor of Parasitology in Department of Natural Resource Sciences
Receveur, Olivier; B.Sc., M.P.H., Ph.D.(Cal-Berkeley); Assistant Professor of Dietetics and Human Nutrition
Ribeiro, Paula A.; B.Sc., Ph.D.(York); Assistant Professor of Parasitology
Routhier Joane; B.Sc.(F.Sc.)(McG.); Faculty Lecturer of Dietetics and Human Nutrition
Sackston, W.E.; B.S.A.(Man.), M.Sc.(McG.), Ph.D.(Minn.), F.C.P.S., F.A.P.S.; Emeritus Professor of Plant Science
Schafer, Donn; B.Sc., M.Sc.(Nutr.Sci.)(McG.); Faculty Lecturer in Dietetics and Human Nutrition
Schuepp, Peter H.; Dipl.Sc.Nat.(Zurich), Ph.D.(Tor.); Professor of Agricultural Physics
Scott, Marilyn E.; B.Sc.(U.N.B.), Ph.D.(McG.); Associate Professor of Parasitology, Director, Institute of Parasitology
Seymour, Norman; B.Sc., M.Sc.(Man.), Ph.D.(McG); Adjunct Professor in the Department of Natural Resource Sciences
Sheppard, John D.J.; B.Sc.(Eng.)(Guelph), M.E., Sc.(W.Ont.), Ph.D.(McG.); Associate Professor of Agricultural and Biosystems Engineering
Simpson, Benjamin K.; B.Sc.(Univ. Sc. & Tech., Kumasi), Ph.D.(Memorial); Associate Professor of Food Science and Agricultural Chemistry
Smith, Donald L.; B.Sc., M.Sc.(Acad.), Ph.D.(Guelph); Professor of Plant Science
Smith, James P.; B.Sc., M.Sc.(Strathclyde), Ph.D.(Alta.); Professor of Food Science
Smith, James M.; B.Sc.(NEPoly.), Ph.D.(McG.); Faculty Lecturer of Parasitology
Sparace, Salvatore A.; B.S.(C'nell), Ph.D.(Wyoming); Associate Professor of Plant Science
Steppler, Howard A.; B.S.A.(Man.), M.Sc., Ph.D.(McG.), F.A.I.C.; Emeritus Professor of Agronomy
Stevenson, Mary M.; B.A.(Hood College), M.S., Ph.D.(Catholic University of America); Associate Professor (PT), Institute of Parasitology
Stewart, Katrine A.; B.Sc.(Agr.)(U.B.C.), Ph.D.(Reading); Associate Professor of Horticulture
Stewart, Robin K.; B.Sc.(Agr.), Ph.D.(Glas.); Professor of Entomology
Thibault, Louise; B.Sc., M.Sc., Ph.D.(Laval); Associate Professor of Dietetics and Human Nutrition
Thomassin, Paul; B.Sc.(Agr.)(McG.), M.Sc., Ph.D.(Hawaii); Associate Professor and Chair of Agricultural Economics
Titman, Rodger D.; B.Sc.(McG.), M.Sc.(Bishop's), Ph.D.(U.N.B.); Associate Professor of Wildlife Biology
Turner, Jeffrey D.; B.Sc.(Mount A.), M.Sc.(McMaster, Illinois), Ph.D.(Illinois); Adjunct Professor of Animal Science
Van de Voort, Frederik R.; B.Sc., M.Sc., Ph.D.(U.B.C.); Professor of Food Science and Agricultural Chemistry
Vickery, Vernon R.; B.Sc.(Agr.), M.Sc., Ph.D.(McG.); Emeritus Curator of the Lyman Entomological Museum and Research Laboratory
Vigneault, Clement; B.Sc., M.Sc.(Laval), Ph.D.(McG.); Adjunct Professor (PT) of Agricultural and Biosystems Engineering
Vincent, Charles; B.Sc.A.(Laval), M.Sc., Ph.D.(McG.); Adjunct Professor (PT) of Entomology

Wade, Kevin; B.Agr.Sc., M.Agr.Sc.(Dublin), Ph.D.(C'nell); Associate Professor of Animal Science
Waterway, Marcia J.; B.A.(Calvin Coll.), M.S.(Wis.), Ph.D.(C'nell); Associate Professor in Plant Science and Curator, McGill University Herbarium
Watson, Alan K.; B.Sc.(Agr.), M.Sc.(U.B.C.), Ph.D.(Sask.); Professor of Agronomy and Director Phytorium/Biopesticide Quarantine Facility
Wees, David D.; B.Sc.(Agr.), M.Sc.(McG.); Faculty Lecturer in Plant Science
Wheeler, Terry; B.Sc.(Memorial), M.Sc., Ph.D.(Guelph); Assistant Professor of Natural Resource Sciences
Whoriskey, Frederick G.; B.Sc.(Brown), Ph.D.(Laval); Adjunct Professor of Wildlife Biology
Wykes, Linda; B.Sc., M.Sc., Ph.D.(Toronto); Assistant Professor of Dietetics and Human Nutrition
Yale, Jean Francois; M.D.(Sherbrooke); Associate Member, School of Dietetics and Human Nutrition
Yaylayan, Vouroujan A.; B.Sc., M.Sc.(Beirut), Ph.D.(Alta.); Associate Professor of Food Science and Agricultural Chemistry
Zadworny, David; B.Sc., Ph.D.(Guelph); Associate Professor of Animal Science
Zhao, Xin; B.Sc., M.Sc.(Nanjing), Ph.D.(C'nell); Associate Professor of Animal Science