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1. The School

1.1 Location
For advising, contact:
Program Coordinator, Mr. Peter Barry
Telephone: (514) 398-4306
Fax: (514) 398-1643
E-mail: info.mse@mcgill.ca
Website: www.mcgill.ca/mse

Downtown Campus
3534 University Street
Montreal, QC H3A 2A7
Telephone: (514) 398-2827
Fax: (514) 398-1643

Macdonald Campus
Rowles House
21,111 Lakeshore Road
Sainte-Anne-de-Bellevue, QC H9X 3V9
Telephone: (514) 398-7559
Fax: (514) 398-7846

1.2 Administrative Officers
Deborah Buszard; B.Sc.(Bath), Ph.D.(Lond.) Dean, Faculty of Agricultural and Environmental Sciences
Carman Miller; B.A., B.Ed.(Acad.), M.A.(Dal.), Ph.D.(Lond.) Dean, Faculty of Arts
Alan G. Shaver; B.Sc.(Car.), Ph.D.(M.I.T.) Dean, Faculty of Science
James W. Fyles; B.Sc., M.Sc.(Vic.), Ph.D.(Alta.) Director (Interim)

Peter Barry; B.Sc.(C’dia), M.Sc.(McG.) Program Coordinator

1.3 Academic Staff

Professor
Peter G. Brown; B.A.(Haverford), M.A., Ph.D.(Columbia) (joint appoint. with Geography and Natural Resource Sciences)

Associate Professor

Assistant Professors
Madhav Badami; B.Tech., M.Sc.(I.T.), M.E.Des.(Calg.), Ph.D.(Br.Col.) (joint appoint. with School of Urban Planning)

Sylvie de Blois; B.Sc.(Agr.) (McG.), M.Sc., Ph.D.(Montr.) (joint appoint. with Plant Science)

Colin Duncan; B.A(Queen’s), M.A., Ph.D.(York)

Jaye Ellis; B.A.(Calg.), LL.B., B.C.L.(McG.), LL.M.(U.B.C.) (joint appoint. with Law)

Frédéric Fabry; B.Sc., M.Sc., Ph.D.(McG.) (joint appoint. with Atmospheric and Oceanic Sciences)

Rebecca Hardin; B.A. (Brown), M.Phil., Ph.D.(Yale) (joint appoint. with Anthropology)

Gregory Mikkelson; B.A.(Trinity), M.S., Ph.D.(Chic.) (joint appoint. with Philosophy)

Anthony Ricciardi; B.Sc.(Agr.), M.Sc., Ph.D.(McG.) (joint appoint. with Redpath Museum)

Lisa Sideris; B.A., M.A., Ph.D.(Indiana) (joint appoint. with Religious Studies)


Joann Whalen; B.Sc.Agr.(Dal.), M.Sc.(McG.), Ph.D.(Ohio St.) (joint appoint. with Natural Resource Sciences)

Associate Members
Agricultural and Biosystems Engineering: Suzelle Barrington, Robert Bonnell
Agricultural Economics: John Henning
Anthropology: John Galaty, Colin H. Scott
Architecture: Avi Freidman
Atmospheric and Oceanic Sciences: Charles Lin
Avian Science and Conservation Centre: David Bird
Biology: Catherine Potvin
Chemistry: Bill Chan
Civil Engineering and Applied Mechanics: Van-Thanh-Van Nguyen, Jim Nicoll
Developing Area Studies: Rosalind Boyd
Dietetics and Human Nutrition, School of: Laurie Chan, Tim Moore, Wayne H. Pollard, Nigel Roulet
Economics: Robert Cairns, Myron Frankman, Chris Green, Franque Grimard, Tom Naylor
Epidemiology and Biostatistics: Mark Goldberg
Geography: Gail Chmura, Oliver Coomes, Thom Meredith, Tim Johns, Harriet Kuhnlein
History: Myron Echenberg
Law, Faculty of: Jane Glenn
Management, Faculty of: Frances Westley
Medicine, Ethics, Law: Margaret Somerville
1.4 Creation of the School

McGill’s Faculties of Agricultural and Environmental Sciences, Arts, and Science have forged a unique approach to the study of environment through the inter-faculty, trans-disciplinary McGill School of Environment (MSE).

The growth of technology, globalizing economies, and rapid increase in population have had dramatic and significant environmental impacts. These changes have been accompanied by an increasing awareness of the relationship between human activity and the environment. Environmental problems range from local and short-term degradation through to the perturbation observed over the entire globe and for many years. The importance of human-environment relations for environmental and social well-being, and the complexity and conflict involved in environmental analysis and decision making, requires a depth and breadth of knowledge. The MSE has developed its programs with the approach of introducing students to a broad range of ideas early in the program to provide a foundation and an openness upon which more specialized, disciplinary knowledge can be built.

1.5 Goals of the School

The McGill School of Environment has the following goals:

• to impart to students an understanding of current environmental problems;

• to provide an exciting and rigorous program that allows for intellectual growth in the comprehension of environmental issues or components of the environment;

• to help students gain an understanding of the complexity and conflicts that underlie most environmental problems; and

• to give students an opportunity to apply their knowledge in the analysis of specific, contemporary problems.

2 Admission, Registration and Regulations

2.1 Admission

Students may be admitted to a B.A., B.Sc.(Ag.Env.Sc.), or a B.Sc. program, offered by the MSE on the University’s two campuses: the Macdonald Campus and the Downtown Campus. They register as students within their Faculty of admission and are governed by all rules and regulations of that Faculty.

Students who have already completed a Bachelor or an equivalent degree may be admitted to the Diploma in Environment through any of the three MSE Faculties: Agricultural and Environmental Sciences, Arts, and Science. They register as students within their Faculty of admission and are governed by all rules and regulations of that Faculty relative to the Diploma. Please see “Admission Requirements” on page 13.

2.2 Degree Requirements

To be eligible for a B.A. degree, students must fulfill all the Faculty and program requirements as indicated under Arts "Faculty Degree Requirements" on page 48.

To be eligible for a B.Sc.(Ag.Env.Sc.) degree, students must fulfill all the Faculty and program requirements as indicated under Agricultural and Environmental Sciences "Faculty Information and Regulations" on page 304.

To be eligible for a B.Sc. degree, students must fulfill all the Faculty and program requirements as indicated under Science "Faculty Degree Requirements" on page 246.

To be eligible for the Diploma in Environment, students must fulfill all program requirements as specified in section 8 'Diploma in Environment'.

2.3 Important Information about Program Selection

The MSE uses students’ program selections to identify which students are in the School’s major programs (and, by extension, which students are in the McGill Environmental Students’ Society).

Students in U1 who are unsure of the Domain they want to pursue may register in the Major or Faculty program in Environment without picking a Domain. However, they must pick a Domain in their U2 year.

Note: Students must select a Domain in order to graduate; they cannot graduate without choosing a Domain.

(Non of the above applies to students in the Minor or Diploma Programs.)

2.4 Course Numbering System at McGill

The first four characters of a McGill course number refer to the unit offering the course. For example, MSE courses begin with the Subject Code ENVR (formerly 170-).

The three numbers following the Subject Code refer to the course itself, with 200-level courses usually taken by U1 students, 300-level by U2 students, and 400-level by U3 students. Senior undergraduate students can also take some 500-level courses, but they should limit themselves to no more than one per semester.

2.5 Examination Regulations

Regulations concerning the method of evaluation of any course (including those governing supplemental examinations) are those of the Faculty that offers the course. Students should note that supplemental exams are available for courses taught in the Faculties of Arts, of Science, and of Education, but not for courses taught in the Faculties of Agricultural and Environmental Sciences, of Engineering, or of Management.

Note: All ENVR courses, regardless of where they are taught, are offered only by the Faculty of Science.

2.6 Courses outside the Student’s Faculty

Students in the School’s B.A., B.Sc., and B.Sc.(Ag.Env.Sc.) programs may take courses outside their Faculty according to the regulations of their Faculty of admission. These regulations are not identical:

• Arts students, see Faculty of Arts "Courses outside the Faculties of Arts and of Science" on page 50.

• Science students, see Faculty of Science “Courses outside the Faculties of Arts and Science” on page 248.

• Regulations for students in the Faculty of Agricultural and Environmental Sciences are being developed for September 2003. Contact Pete Barry, MSE Program Coordinator, for details.
Faculty of Science students in particular should be aware that some courses are restricted and cannot be taken for credit. See the Science Student Affairs Website at www.mcgill.ca/artsci. Check under Course Information, Course Restrictions.

Students in the Diploma in Environment follow the program as specified.

### 3 Programs Offered

The McGill School of Environment has developed five programs which are offered on the Downtown and Macdonald campuses. These programs strive to offer the flexibility necessary to deal with the environment through a set of core courses that provide the general knowledge base of the program combined with a progressive series of courses in a trans-disciplinary area of environmental specialization, referred to as a Domain.

The programs are designed to prepare students for further study in environment or discipline-based graduate programs, and for employment in industry, government, and education.

The MSE offers five options for students interested in pursuing environmental studies.

1. **A Minor in Environment** is open to all undergraduate students.

2. **A Faculty Program in Environment leading to a B.A** is open to students meeting the entrance requirements of the Faculty of Arts.

3. **A Major in Environment leading to a B.Sc.(Ag.Env.Sc.)** is open to students meeting the entrance requirements of the Faculty of Agricultural and Environmental Sciences.

4. **A Major in Environment leading to a B.Sc.** is open to students meeting the entrance requirements of the Faculty of Science.

5. **A Diploma in Environment** is available only to students who have already completed a Bachelor or an equivalent degree, and who wish to return to university for further undergraduate study. The Diploma is offered by all three MSE Faculties: Agricultural and Environmental Sciences, Arts, and Science.

### 4 Minor in Environment

The Minor in Environment is intended to complement an expertise obtained through a Major, Major Concentration or a Faculty Program offered by an academic unit other than the MSE. Students taking the Minor in Environment are exposed to different approaches, perspectives, and world views that will help them gain an understanding of the complexity and conflicts that underlie environmental problems.

Students, after consulting with their adviser in their major program or concentration and the MSE Program Coordinator, can declare their intention to do a Minor in Environment.

To obtain a Minor in Environment, students must:

(a) register for the Minor on-line, using Minerva;

(b) submit their program of courses already taken and to be taken for the Minor in Environment to the MSE Program Coordinator for approval;

(c) pass all courses counted towards the Minor with a grade of C or higher;

(d) complete 18 credits from the courses listed below not otherwise counted towards the student’s Major program or concentration or a second Minor program; and

(e) ensure that all the credits specified in (c) above are taken outside the discipline or field of the student’s Major program or concentration.

### 4.1 Minor Concentration in Environment

This 18-credit Minor is intended for Arts students in the multi-track system.

**Adviser:** Mr. Pete Barry, MSE Program Coordinator

**E-mail:** info.mse@mcgill.ca

**Telephone:** (514) 398-4306

**Complementary Courses (18 credits)**

12 credits selected from the MSE core courses:

- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 400 (3) Environmental Thought

6 credits selected from Thematic Categories*, at least 3 credits must be from the list of courses in the thematic area of Natural Sciences and Technology.

* See section 10 “List of approved Thematic Category Courses for the Minor and the Diploma”. Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

### 4.2 Minor Program in Environment

This 18-credit Minor is intended for Science and Agricultural and Environmental Science students, but is open to students from other faculties as well, except Arts.

**Adviser:** Mr. Pete Barry, MSE Program Coordinator

**E-mail:** info.mse@mcgill.ca

**Telephone:** (514) 398-4306

**Complementary Courses (18 credits)**

12 credits selected from the MSE core courses:

- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 400 (3) Environmental Thought

6 credits selected from Thematic Categories*, at least 3 credits must be from the list of courses in the thematic area of Social Sciences and Policy.

* See section 10 “List of approved Thematic Category Courses for the Minor and the Diploma”. Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

### 5 B.A. Faculty Program in Environment

The B.A. Faculty Program has two components: Core and Domain. Students follow three steps in their degree program.

1. **Core:** The Core consists of four introductory courses and one intermediate-level course where students are exposed to the different approaches, perspectives, and world views that will help them gain an understanding of the complexity and conflicts that underlie most environmental problems. Through the Core program students go beyond the confines of their individual views of environment.

2. **Domain:** Domains provide a trans-disciplinary study of a particular theme or component of the environment.

3. **Senior Core and Research:** In the two senior courses of the Core, students will apply the general and specialized knowledge that they have gained in the program to the analysis of some specific, contemporary environmental problems.
To obtain a B.A. Faculty Program in Environment students must:

a. register in a Domain on-line, using Minerva;

b. satisfy the co-/pre-requisites for the program (calculus and a basic science course);

c. pass all courses counted towards the Faculty Program with a grade of C or higher;

d. confirm that their course selection satisfies the required components of the MSE Core and their chosen Domain, and that the complementary courses are approved courses in their chosen Domain; and

e. fulfill all Faculty requirements as specified for the B.A. in the Arts “Faculty Degree Requirements” on page 48, which include meeting the minimum credit requirement as specified in their letter of admission.

B.A. FACULTY PROGRAM IN ENVIRONMENT (54 credits)

The B.A. Faculty Program requires, as either a pre- or co-requisite for the first year of the program:

3 credits of calculus:
MATH 139 Calculus
or MATH 140 Calculus 1
or equivalent (e.g., CEPEG objective 00UN)

3 credits of basic science chosen from:
BIOL 111 Principles: Organismal Biology (required for the Ecological Determinants of Health in Society Domain)
or CHEM 110 General Chemistry 1
or PHYS 121 Introductory Physics - Mechanics
or their equivalents (e.g., CEPEG objectives: Biology 00UK, Chemistry 00UL, Physics 00UR).

Core: Required Courses (18 credits)
The Core courses are listed below in the Domain descriptions.

Core: Complementary Course – Senior Research Project (3 credits)
The research courses are listed in the Domain descriptions.

Domain (33 credits)
one MSE Domain selected from those available to students in the B.A. Faculty program.

Currently available:
Ecological Determinants of Health in Society
Economics and the Earth’s Environment
Environment and Development

Each Domain has different requirements which are listed below. Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

5.1 Ecological Determinants of Health in Society

Domain
This Domain (54 credits including Core) is open only to students in the B.A. Faculty Program in Environment.
Adviser: Professor Tim Johns
E-mail: johns@macdonald.mcgill.ca
Telephone: (514) 398-7847

An understanding of the interface between human health and environment depends not only on an appreciation of the biological and ecological determinants of health, but equally on an appreciation of the role of social sciences in the design, implementation, and monitoring of interventions. Demographic patterns and urbanization, economic forces, ethics, indigenous knowledge and culture, and an understanding of how social change can be effected are all critical if we are to be successful in our efforts to assure health of individuals and societies in the future. Recognizing the key role that nutritional status plays in maintaining a healthy body, and the increasing importance of infection as a health risk linked intimately with the environment, this domain prepares students to contribute to the solution of problems of nutrition and infection by tying the relevant natural sciences to the social sciences.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

Prerequisite or Corequisite Courses for Program
MATH 139 (4) Calculus
or MATH 140 (3) Calculus 1
or equivalent (e.g., CEPEG objective 00UN)

BIOL 111 (3) Principles: Organismal Biology
or AEBI 120 (3) General Biology (M)
or equivalent (e.g., CEPEG objective 00UK or equivalent)

NOTE: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses, but does not include the Program prerequisites or co-requisites listed above.

Core: Required Courses (18 credits)
ENVR 200 (3) The Global Environment
ENVR 201 (3) Society and Environment
ENVR 202 (3) The Evolving Earth
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project (3 credits*)
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Courses (6 credits)
PARA 410 (3) Environment and Infection (M)
SOCI 234 (3) Population and Society

Domain: Complementary Courses (27 credits)
12 credits of Fundamentals (maximum 3 credits from any one category):
Health and Pollution
ANTH 227 (3) Medical Anthropology
WILD 333 (3) Physical and Biological Aspects of Pollution (M)

Economics
AGEC 200 (3) Principles of Microeconomics (M)
ECON 208 (3) Microeconomic Analysis and Applications

Nutrition
NUTR 200 (3) Contemporary Nutrition
NUTR 207 (3) Nutrition and Health (M)

Statistics
AEMA 310 (3) Statistical Methods 1 (M)
MATH 203 (3) Principles of Statistics
SOCI 350 (3) Statistics in Social Research
or equivalent

9 credits from List A (maximum 3 credits from any one category):
Hydrology and Climate
ABEN 217 (3) Hydrology and Drainage (M)
AEPH 510 (3) Agricultural Micrometeorology (M)
GEOG 321 (3) Climatic Environments
GEOG 322 (3) Environmental Hydrology

Agriculture
AGRI 210 (3) Agro-Ecological History (M)
AGRI 340 (3) Principles of Ecological Agriculture (M)
AGRI 411 (3) International Agriculture (M)
Earth's environment. Examples of these applications include the economic effects of public policy towards resource industries and methods of waste disposal, and the potential effects of global warming on the global economy. Students also learn of minerals, rocks, soils, and waters which define much of Earth's environment and how these materials interact with each other and with the atmosphere. Courses in specific subdisciplines of Earth sciences combined with courses presenting a global vision of how the Earth and its environment operate provide the student with the necessary knowledge of geologic processes. Examples of this knowledge include the effects of mineral and energy extraction on the environment and how industrial waste interacts with solids and liquids in the environment. The Earth science and economics studies merge in the final year when the students apply what they have learned in the Domain to current environmental issues.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

Prerequisite or Corequisite Courses for Program
3 credits of calculus:
- MATH 139 Calculus
- or MATH 140 Calculus 1
- or equivalent (e.g., CEGEP objective 00UN)

3 credits of basic science chosen from:
- 3 credits of biology:
  - BIOL 111 Principles: Organismal Biology
- 3 credits of chemistry:
  - CHEM 110 General Chemistry 1
  - or PHYS 101 Introductory Physics - Mechanics
- 3 credits of statistics:
  - AEMA 310A Statistical Methods 1

NOTES: Students are required to take a maximum of 34 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses, but does not include the Domain prerequisites or corequisites listed above.

Core: Required Courses (18 credits)
- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 301 (3) Environmental Research Design
- ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project (3 credits*)
- ENVR 401 (3) Environmental Research
- ENVR 451 (6) Research in Panama (in Panama)
- ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Courses (16 credits)
- ECON 230D1 (3) Microeconomic Theory
- ECON 230D2 (3) Microeconomic Theory
- ECON 405 (3) Natural Resource Economics
- EPSC 210 (3) Introductory Mineralogy
- EPSC 212 (4) Introductory Petrology

Domain: Complementary Courses (17 credits)
3 credits of ecology:
- AEBI 205 (3) Principles of Ecology (M)
- BIOL 208 (3) Introduction to Ecology

3 credits of statistics:
- AEMA 310A (3) Statistical Methods 1 (M)
- GEOG 202 (3) Statistics and Spatial Analysis
- MATH 203 (3) Principles of Statistics 1
- or equivalent
The quest for sustainable paths to economic development requires scholars and practitioners to transcend the boundaries of traditional disciplines. This Domain offers students sufficient depth and breadth of study to acquire a strong grasp of current theories, concepts, and approaches to environment and development. It prepares them for graduate study in interdisciplinary programs (e.g., development studies or environmental studies) as well as in integrative social sciences (e.g., anthropology, geography, etc.).

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva. (Introductory Core courses are offered on both campuses.)

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

### Prerequisite or Corequisite Courses for Program

3 credits of calculus:
- MATH 139 Calculus
- or MATH 140 Calculus 1
- or equivalent (e.g., CEGEP objective 00UN)

3 credits of basic science chosen from:
- BIOL 111 Principles: Organismal Biology
- or CHEM 110 General Chemistry 1
- or PHYS 101 Introductory Physics - Mechanics
- or equivalent (e.g., CEGEP objectives: Biology 00UK, Chemistry 00UL, Physics 00UR).

**NOTE:** Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses.

### Core: Required Courses (18 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVR 200</td>
<td>The Global Environment</td>
</tr>
<tr>
<td>ENVR 201</td>
<td>Society and Environment</td>
</tr>
<tr>
<td>ENVR 202</td>
<td>The Evolving Earth</td>
</tr>
<tr>
<td>ENVR 203</td>
<td>Knowledge, Ethics and Environment</td>
</tr>
<tr>
<td>ENVR 301</td>
<td>Environmental Research Design</td>
</tr>
<tr>
<td>ENVR 400</td>
<td>Environmental Thought</td>
</tr>
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</table>

### Domain: Required Courses (12 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTH 339</td>
<td>Ecological Anthropology</td>
</tr>
<tr>
<td>ECON 313</td>
<td>Economic Development 1</td>
</tr>
<tr>
<td>ECON 314</td>
<td>Economic Development 2</td>
</tr>
<tr>
<td>GEOG 302</td>
<td>Human Ecology in Geography</td>
</tr>
<tr>
<td>GEOG 305</td>
<td>Soils and Environment</td>
</tr>
<tr>
<td>GEOG 306</td>
<td>Environmental Hydrology</td>
</tr>
<tr>
<td>GEOG 311</td>
<td>Urban Social Geography</td>
</tr>
<tr>
<td>GEOG 313</td>
<td>Introduction to Sociology</td>
</tr>
<tr>
<td>GEOG 322</td>
<td>Environmental Hydrology</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>Urban Social Geography</td>
</tr>
<tr>
<td>GEOG 345</td>
<td>Environmental Sociology</td>
</tr>
<tr>
<td>GEOG 404</td>
<td>Environmental Management 2 (in Panama)</td>
</tr>
<tr>
<td>GEOG 405</td>
<td>Environmental Management 1</td>
</tr>
<tr>
<td>GEOG 410</td>
<td>Geography of Underdevelopment: Current Problems</td>
</tr>
</tbody>
</table>

### Domain: Complementary Courses (21 credits)

3 credits of microeconomics:
- AGEC 200 (M) Principles of Microeconomics
- ECON 208 (M) Microeconomic Analysis and Applications

3 credits of statistics:
- AEMA 310 (M) Statistical Methods 1
- GEOG 202 (M) Statistics and Spatial Analysis
- MATH 203 (M) Principles of Statistics 1

3 credits of ecology:
- AEBI 205 (M) Principles of Ecology
- BIOL 208 (M) Introduction to Ecology

6 credits of advanced development courses:
- ANTH 418 (M) Environment and Development
- GEOG 408 (M) Geography of Development
- GEOG 410 (M) Geography of Underdevelopment: Current Problems

### Domain: Complementary Courses (21 credits)

3 credits of natural sciences
- AGRI 550 (M) Sustained Tropical Agriculture (in Panama)
- BIOL 465 (M) Conservation Biology
- BIOL 553 (M) Neotropical Environments (in Panama)
- BIOL 560 (M) Aquatic Conservation
- GEOG 305 (M) Soils and Environment
- GEOG 322 (M) Environmental Hydrology
- NUTR 501 (M) Nutrition in Developing Countries (M)
- PARA 410 (M) Environment and Infection (M)

3 credits of social sciences
- AGEC 333 (M) Resource Economics
- AGEC 442 (M) Economics of International Development
- AGRI 210 (M) Agro-Ecological History
- ANTH 439 (M) Theories of Development
- ANTH 445 (M) Property and Land Tenure
- BIOL 553 (M) Political Ecology
- CANS 407 (M) Understanding Atlantic Canada (at Bay of Fundy)
- ECON 326 (M) Ecological Economics
- ECON 405 (M) Natural Resource Economics
- ENVR 465 (M) Environment and Social Change (at Bay of Fundy)
- GEOG 201 (M) Introductory Geo-Information Science
- GEOG 300 (M) Human Ecology in Geography
- GEOG 331 (M) Urban Social Geography
- GEOG 404 (M) Environmental Management 2 (in Panama or Africa)
6 Major Program in Environment – B.Sc.(Ag.Env.Sc.) and B.Sc.

Students in the Faculty of Agricultural and Environmental Sciences B.Sc.(Ag.Env.Sc.) program and students in the Faculty of Science B.Sc. program can register in the Major in Environment.

The Major has two components: Core and Domain. Students follow three steps in their degree program.

1. **Core**: The Core consists of four introductory courses and one intermediate-level course where students are exposed to the different approaches, perspectives, and world views that will help them gain an understanding of the complexity and conflicts that underlie most environmental problems. Through the Core program students go beyond the confines of their individual views of environment.

2. **Domain**: Domains provide a trans-disciplinary study of a particular theme or component of the environment.

3. **Senior Core and Research**: In the two senior courses of the Core, students will apply the general and specialized knowledge that they have gained in the program to the analysis of some specific, contemporary environmental problems.

To obtain a Major in Environment, students must:

- register in a Domain, on-line using Minerva;
- pass all courses counted towards the Major with a grade of C or higher;
- confirm that their course selection satisfies the required components of the MSE Core and their chosen Domain, and that the complementary courses are approved courses in their chosen Domain; and
- fulfill all Faculty requirements as specified by the faculty in which they are registered: for the B.Sc. (Ag.Env.Sc.) refer to Agricultural and Environmental Sciences “Faculty Information and Regulations” on page 304; for the B.Sc. refer to Science “Faculty Degree Requirements” on page 246. This includes meeting the minimum credit requirement as specified in their letter of admission.

MAJOR PROGRAM IN ENVIRONMENT (57 to 66 credits – depending upon Domain selected)

**Core: Required Courses** (18 credits)

The Core courses are listed below in the Domain descriptions.

**Core: Complementary Course – Senior Research Project** (3 credits)

The research courses are listed in the Domain descriptions.

**Domain** (36 to 45 credits – depending upon Domain selected)

Currently available for B.Sc.(Ag.Env.Sc.) or B.Sc.:

- Biodiversity and Conservation (42 credits)
- Ecological Determinants of Health – Population Stream or Cellular Stream (39 credits)
- Land Surface Processes and Environmental Change (42 credits)
- Environmetrics (42 credits)
- Food Production and the Environment (45 credits)
- Renewable Resource Management (42 credits)
- Water Environments and Ecosystems – Physical Stream or Biological Stream (36 - 39 credits)

Currently available for B.Sc. only (see section 7 “Major Program in Environment – B.Sc.”):

- Atmospheric Environment and Air Quality (39 credits)
- Earth Sciences and Economics (45 credits)

Each Domain has different requirements which are listed below. Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

6.1 **Biodiversity and Conservation Domain**

This Domain (63 credits including Core) is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.

Advisers: Professor Graham Bell
E-mail: gbell2@maclan.mcgill.ca
Telephone: (514) 398-4086 local 4087

Professor David Green
E-mail: david.m.green@mcgill.ca
Telephone: (514) 398-4086 local 4088

This Domain links the academic study of biological diversity with the applied field of conservation biology. The study of biological diversity, or ‘biodiversity’, lies at the intersection of evolution with ecology and genetics, combining the subdisciplines of evolutionary ecology, evolutionary genetics and ecological genetics. It has two main branches, the creation of diversity and the maintenance of diversity. Both processes are governed by a general mechanism of selection acting over different scales of space and time. This gives rise to a distinctive set of principles and generalizations that regulate rates of diversification and levels of diversity, as well as the abundance or rarity of different species. Conservation biology constitutes the application of these principles in the relevant social and economic context to the management of natural systems, with the object of preventing the extinction of rare species and maintaining the diversity of communities. As the impact of industrialization and population growth on natural systems has become more severe, conservation has emerged as an important area of practical endeavour.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

**NOTE**: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses.

**Core: Required Courses** (18 credits)

- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 301 (3) Environmental Research Design
- ENVR 400 (3) Environmental Thought
Core: Complementary Course – Senior Research Project
(3 credits*)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)
* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Courses (9 credits)
9 credits, basic courses in the biological principles of diversity, systematics and conservation:
BIOL 304 (3) Evolution
BIOL 305 (3) Diversity of Life
BIOL 465 (3) Conservation Biology

Domain: Complementary Courses (33 credits)
6 credits of ecology and statistics:
BIOL 208 (3) Introduction to Ecology
or AEBI 205 (3) Principles of Ecology (M)
BIOL 373 (3) Biometry
or ABEN 310 (3) Statistical Methods 1 (M)
9 credits, interface between science, policy and management:
ANTH 418 (3) Environment and Development
ECON 225 (3) Economics of the Environment
GEOG 302 (3) Environmental Management 1
GEOG 408 (3) Geography of Development
GEOG 410 (3) Geography of Underdevelopment: Current Problems
3 credits of field courses:
BIOL 331 (3) Ecology/Behaviour Field Course (at Mont St. Hilaire)
BIOL 334 (3) Applied Tropical Ecology (M in Barbados)
BIOL 553 (3) Neotropical Environments (in Panama)
GEOG 495 (3) Field Studies - Physical Geography (at Mont St. Hilaire)
GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)
GEOG 499 (3) Subarctic Field Studies (in Schefferville)
WILD 475 (3) Desert Ecology (in Arizona)
6 credits of general scientific principles:
ABEN 330 (3) GIS for Biosystems Engineering (M)
or GEOG 306 (3) Raster Geo-Information Science
BIOL 324 (3) Ecological Genetics
BIOL 341 (3) History of Life
BIOL 432 (3) Limnology
BIOL 441 (3) Biological Oceanography
BIOL 442 (3) Marine Biology
BIOL 473 (3) Ecology of Aquatic Invertebrates
BIOL 505 (3) Diversity and Systematics Seminar
BIOL 560 (3) Aquatic Conservation
GEOG 272 (3) Earth’s Changing Surface
GEOG 321 (3) Climatic Environments
GEOG 350 (3) Ecological Biogeography
NRSC 331 (3) Microbial Ecology (M)
PLNT 460 (3) Plant Ecology (M)
WILD 375 (3) Issues: Environmental Sciences (M)
WILD 410 (3) Wildlife Ecology (M)
WILD 437 (2) Assessing Environmental Impact (M)
WOOD 410 (3) The Forest Ecosystem (M)
WOOD 420 (3) Environmental Issues: Forestry (M)
ZOOL 313 (3) Zoogeography (M)
(A second field course from the Domain curriculum may also be taken)
3 credits of social science:
AGEC 333 (3) Resource Economics (M)
ANTH 339 (3) Ecological Anthropology
ANTH 416 (3) Environment/Development: Africa (in Africa)
ECON 326 (3) Ecological Economics
ENVR 465 (3) Environment and Social Change (at Bay of Fundy)
GEOG 404 (3) Environmental Management 2 (in Panama)

GEOG 498 (3) Humans in Tropical Environments (in Panama)
GEOG 510 (3) Humid Tropical Environments
SOCI 328 (3) Environmental Sociology
WILD 415 (2) Conservation Law (M)
(Wildlife Conservation (M)
6 credits, organisms and diversity;
BIOL 327 (3) Herpetology
BIOL 335 (3) Marine Mammals (at Bay of Fundy)
BIOL 350 (3) Insect Biology and Control
BIOL 351 (3) The Biology of Invertebrates
BIOL 358 (3) Canadian Flora
or PLNT 358 (3) Flowering Plant Diversity (M)
BIOL 437 (3) Advanced Invertebrate Zoology
ENTO 352 (3) Control of Insect Pests (M)
ENTO 440 (3) Systematic Entomology (M)
PLNT 304 (3) Biology of Fungi (M)
PLNT 458 (3) Flowering Plant Systematics (M)
WILD 350 (3) Mammalogy (M)
WILD 420 (3) Ornithology (M)
ZOOL 302 (3) Natural History of Vertebrates (M)
ZOOL 312 (3) Zoological Systematics and Evolution (M)
ZOOL 424 (3) Parasitology (M)

6.2 Ecological Determinants of Health Domain
This Domain (63 credits including Core) is open only to students in the B.Sc (Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.
Adviser: Professor Tim Johns
E-mail: johns@macdonald.mcgill.ca
Telephone: (514) 398-7847

This Domain considers the interface between the environment and human well-being, with particular focus on the triad that ties human health to the environment through the elements of food and infectious agents. Each of these elements is influenced by planned and unplanned environmental disturbances.

For example, agricultural practices shift the balance between beneficial and harmful ingredients of food. Use of insecticides presents dilemmas with regard to the environment, economics and human health. The distribution of infectious diseases is influenced by the climatic conditions that permit vectors to coexist with man, by deforestation, by urbanization, and by human interventions ranging from the building of dams to provision of potable water.

In designing interventions that aim to prevent or reduce infectious contaminants in the environment, or to improve food production and nutritional quality, not only is it important to understand methods of intervention, but also to understand social forces that influence how humans respond to such interventions.

Students in the Population Stream will gain a depth of understanding at an ecosystem level that looks at society, land and population health. Students in the Cellular Stream will explore the interactions in more depth, at a physiological level.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)
Ecological Determinants of Health Domain –
Cellular Stream
This Domain (63 credits) is open only to students in the
B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment
program.
NOTE: Students are required to take a maximum of 31 credits
at the 200 level and a minimum of 12 credits at the 400 level or
higher in this program. This includes Core and Required
courses.
Core: Required Courses (18 credits)
ENVR 200 (3) The Global Environment
ENVR 201 (3) Society and Environment
ENVR 202 (3) The Evolving Earth
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought
Core: Complementary Course – Senior Research Project
(3 credits*)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)
* Only 3 credits will be applied to the program; extra credits will
count as electives.
Domain: Required Courses (6 credits)
PARA 410 (3) Environment and Infection (M)
SOCI 234 (3) Population and Society
Domain - Cellular Stream: Complementary Courses
(36 credits)
18 credits of Fundamentals:
Toxicology
NUTR 420 (3) Toxicology and Health Risks (M)
or PHAR 303 (3) Principles of Toxicology
Cellular Biology
AEBI 202 (3) Cellular Biology (M)
or ANSC 234 (3) Biochemistry 2 (M)
or BIOL 201 (3) Cell Biology and Metabolism
Genetics
BIOL 202 (3) Basic Genetics
or CELL 204 (4) Genetics (M)
Molecular Biology
BIOL 200 (3) Molecular Biology
or FDSC 211 (3) Biochemistry 1 (M)
Statistics
AEMA 310 (3) Statistical Methods 1 (M)
or MATH 203 (3) Principles of Statistics 1
or equivalent
Nutrition
ANSC 330 (3) Fundamentals of Nutrition (M)
or NUTR 307 (3) Human Nutrition (Video conference Downtown and Macdonald)
12 credits chosen from Human Health:
Immunology and Pathogenicity
MICR 341 (3) Mechanisms of Pathogenicity (M)
or MIMM 314 (3) Immunology
or PARA 438 (3) Immunology (M)
or PATH 300 (3) Human Disease
Infectious Disease
MIMM 324 (3) Fundamental Virology
or MIMM 413 (3) Parasitology
or PARA 400 (3) Eucaryotic Cells and Viruses (M)
or ZOOL 424 (3) Parasitology (M)
Nutrition
NUTR 403 (3) Nutrition in Society (M)
or NUTR 512 (3) Herbs, Foods and Phytochemicals (Video conference Downtown and Macdonald)

Drugs and Hormones
ANSC 424 (3) Metabolic Endocrinology (M)
or PHAR 300 (3) Drug Action
Physiology
ANSC 323 (4) Mammalian Physiology (M)
or PHGY 209 (3) Mammalian Physiology 1
6 credits chosen from the Natural Environment:
Hydrology and Climate
ABEN 217 (3) Hydrology and Drainage (M)
or AEPH 510 (3) Agricultural Micrometeorology (M)
or GEOG 321 (3) Climatic Environments
or GEOG 322 (3) Environmental Hydrology
Techniques and Management
ABEN 322 (3) Food Production/Processing Waste Management (M)
or CHEE 230 (3) Environmental Aspects of Technology
or GEOG 302 (3) Environmental Management 1
or WILD 437 (3) Assessing Environmental Impact (M)
Pest Management
BIOL 350 (3) Insect Biology and Control
or ENTO 352 (3) Control of Insect Pests (M)
or PLNT 361 (3) Pest Management and the Environment (M)
Pollution Control and Management
ABEN 518 (3) Pollution Control for Agriculture (M)
or CHEM 307 (3) Analytical Chemistry of Pollutants
or WILD 333 (3) Physical and Biological Aspects of Pollution (M)
Ecology
BIOL 432 (3) Limnology
or BIOL 485 (3) Conservation Biology
or BIOL 553 (3) Neotropical Environments (in Panama)
or GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)
or MICR 331 (3) Microbial Ecology (M)
or PLNT 304 (3) Biology of Fungi (M)
or PLNT 460 (3) Plant Ecology (M)
or WILD 410 (3) Wildlife Ecology (M)
or WOOD 410 (3) The Forest Ecosystem (M)

Ecological Determinants of Health Domain –
Population Stream
This Domain (63 credits) is open only to students in the
B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment
program.
NOTE: Students are required to take a maximum of 31 credits
at the 200 level and a minimum of 12 credits at the 400 level or
higher in this program. This includes Core and Required
courses.
Core: Required Courses (18 credits)
ENVR 200 (3) The Global Environment
ENVR 201 (3) Society and Environment
ENVR 202 (3) The Evolving Earth
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought
Core: Complementary Course – Senior Research Project
(3 credits*)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)
* Only 3 credits will be applied to the program; extra credits will
count as electives.
Domain: Required Courses (6 credits)
PARA 410 (3) Environment and Infection (M)
SOCI 234 (3) Population and Society
Domain - Population Stream: Complementary Courses

(36 credits)

18 credits of fundamentals:

**Toxicology**
- NUTR 420 (3) Toxicology and Health Risks (M)
- or PHAR 303 (3) Principles of Toxicology

**Genetics**
- BIOL 202 (3) Basic Genetics
- or CELL 204 (4) Genetics (M)

**Biology**
- BIOL 200 (3) Molecular Biology
- or BIOL 201 (3) Cell Biology and Metabolism
- or FDSC 211 (3) Biochemistry 1 (M)

**Statistics**
- AEMA 310 (3) Statistical Methods 1 (M)
- or MATH 203 (3) Principles of Statistics 1
- or equivalent

**Nutrition**
- ANSC 330 (3) Fundamentals of Nutrition (M)
- or NUTR 207 (3) Nutrition and Health (M)
- or NUTR 307 (3) Human Nutrition (Video conference Downtown and Macdonald)

**Advanced Ecology**
- AEMA 306 (3) Mathematical Methods in Ecology (M)
- or BIOL 465 (3) Conservation Biology
- or BIOL 553 (3) Neotropical Environments (in Panama)
- or GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)
- or MIRC 331 (3) Microbial Ecology (M)
- or PLNT 460 (3) Plant Ecology (M)
- or WILD 410 (3) Wildlife Ecology (M)
- or WOOD 410 (3) The Forest Ecosystem (M)

6 credits from the following List A:

**Hydrology, Climate, and Agriculture**
- ABEN 217 (3) Hydrology and Drainage (M)
- or AEPH 510 (3) Agricultural Micrometeorology (M)
- or AGRI 340 (3) Principles of Ecological Agriculture (M)
- or AGRI 550 (3) Sustained Tropical Agriculture (in Panama)
- or GEOG 321 (3) Climatic Environments
- or GEOG 322 (3) Environmental Hydrology

**Decision Making and Social Change**
- AGEC 242 (3) Management Theories and Practices (M)
- or BIOL 535 (3) Political Ecology
- or ECON 208 (3) Microeconomic Analysis and Applications
- or EDER 461 (3) Society and Change
- or ENV 465 (3) Environmental and Social Change (at Bay of Fundy)
- or GEOG 302 (3) Environmental Management 1
- or GEOG 404 (3) Environmental Management 2 (in Panama)
- or PHIL 343 (3) Biomedical Ethics

**Development and History**
- AGRI 210 (3) Agro-Ecological History (M)
- or ANTH 212 (3) Anthropology of Development
- or HIST 292 (3) History and the Environment
- or SOCI 254 (3) Development and Underdevelopment

12 credits from the following list B:

**Techniques and Management**
- ABEN 330 (3) GIS for Biosystems Engineering (M)
- or CHEE 230 (3) Environmental Aspects of Technology
- or GEOG 201 (3) Introductory Geo-Information Science
- or WILD 437 (3) Assessing Environmental Impact (M)

**Immunology and Infectious Disease**
- EPIB 637 (3) Infectious and Parasitic Disease

**Epidemiology**
- or MIM 314 (3) Immunology
- or MIM 324 (3) Fundamental Virology
- or MIM 413 (3) Parasitology
- or PARA 400 (3) Eucaryotic Cells and Viruses (M)
- or PARA 438 (3) Immunology (M)
- or ZOOL 424 (3) Parasitology (M)

**Nutrition and Agriculture**
- NUTR 403 (3) Nutrition in Society (M)
- or AGRI 411 (3) International Agriculture (M)
- or NUTR 501 (3) Nutrition in Developing Countries (M)
- or NUTR 512 (3) Herbs, Foods and Phytochemicals (Video conference Downtown and Macdonald)

**Populations and Place**
- CANS 407 (3) Understanding Atlantic Canada (at Bay of Fundy)
- or GEOG 300 (3) Human Ecology in Geography
- or GEOG 498 (3) Humans in Tropical Environments (in Panama)
- or PSYC 533 (3) International Health Psychology
- or SOCI 328 (3) Environmental Sociology

**Pollution and Pest Management**
- ABEN 322 (3) Food Production/Processing Waste Management (M)
- or BIOL 350 (3) Insect Biology and Control
- or ENTO 352 (3) Control of Insect Pests (M)
- or PLNT 361 (3) Pest Management and the Environment (M)
- or WILD 333 (3) Physical and Biological Aspects of Pollution (M)

### 6.3 Environmetrics Domain

This Domain (63 credits including Core) is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.

Adviser: Professor Dutilleul
E-mail: dutilleul@macdonald.mcgill.ca
Telephone: (514) 398-7851 ext. 7870

In view of the crucial need for sound study design and appropriate statistical methods for analyzing environmental changes and their impacts on humans and various life forms and their ecological relationships, this program is intended to provide students with a strong background in the use of statistical methods of data analysis in environmental sciences.

Graduates will be capable of effectively participating in the design of environmental studies and adequately analyzing data for use by the environmental community. Accordingly, the list of courses for the Environmetrics Domain is composed primarily of statistics courses and mathematically-oriented courses with biological and ecological applications. The list is completed by general courses that refine the topics introduced in the MSE core courses by focusing on the ecology of living organisms, soil sciences or water resources, and impact assessment. These courses should allow the students to understand their interlocutors and be understood by them in their future job. Students can further develop their background in applied or mathematical statistics and their expertise in environmental sciences, by taking complementary courses along each of two axes: statistics and mathematics, and environmental sciences. An internship is also offered to students to provide them with preliminary professional experience.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

NOTE: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses.

**Core: Required Courses (18 credits)**

- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment

- ABEN 217 (3) Hydrology and Drainage (M)

- or AEPH 510 (3) Agricultural Micrometeorology (M)

- or AGRI 340 (3) Principles of Ecological Agriculture (M)

- or AGRI 550 (3) Sustained Tropical Agriculture (in Panama)

- or GEOG 321 (3) Climatic Environments

- or GEOG 322 (3) Environmental Hydrology

- or GEOG 302 (3) Environmental Management 1

- or GEOG 404 (3) Environmental Management 2 (in Panama)

- or PHIL 343 (3) Biomedical Ethics

- or WILD 410 (3) Wildlife Ecology (M)

- or WOOD 410 (3) The Forest Ecosystem (M)
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project
(3 credits*)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Course (6 credits)
AEMA 403 (3) Environmetrics Stage (internship) (M)
AEMA 414 (3) Temporal and Spatial Statistics (M)

Domain - Complementary Courses (36 credits, minimum)
15 credits from:
AEBI 205 (3) Principles of Ecology (M)
or BIOL 208 (3) Introduction to Ecology
MIME 308 (3) Social and Economic Impacts of Technology
or WILD 437 (3) Assessing Environmental Impact (M)
AEMA 306 (3) Mathematical Methods in Ecology (M)
or BIOL 309 (3) Mathematical Models in Biology
ABEN 330 (3) GIS for Biosystems Engineering (M)
or GEOG 201 (3) Introductory Geo-Information Science
AEMA 411 (3) Experimental Designs (M)
or CIVE 555 (3) Environmental Data Analysis

3 credits of basic environmental science:
ABEN 217 (3) Hydrology and Drainage (M)
CIVE 323 (3) Hydrology and Water Resources
GEOG 305 (3) Soils and Environment
GEOG 322 (3) Environmental Hydrology
GEOG 350 (3) Ecological Biogeography
SOIL 210 (3) Principles of Soil Science (M)

6 credits of Statistics, one of the following two options:
Option 1:
MATH 323 (3) Probability Theory
MATH 324 (3) Statistics

Option 2:
AEMA 310 (3) Statistical Methods 1 (M)
or BIOL 373 (3) Biometry

plus one 3-credit complementary applied statistics course of the statistics and mathematics section.

6 credits of statistics and mathematics chosen from:
ABEN 252 (3) Structured Computer Programming (or equivalent) (M)
ABEN 319 (3) Applied Mathematics (or equivalent) (M)
GEOG 351 (3) Quantitative Methods
GEOG 501 (3) Modelling Environmental Systems
MATH 223 (3) Linear Algebra
MATH 423 (3) Regression and Analysis of Variance
MATH 447 (3) Stochastic Processes
MATH 525 (4) Sampling Theory and Applications
SOCI 461 (3) Quantitative Data Analysis
SOCI 504 (3) Quantitative Methods 1
SOCI 505 (3) Quantitative Methods 2
SOCI 580 (3) Social Research Design and Practice.

6 credits, minimum, of environmental sciences chosen from:
AGRI 550 (3) Sustained Tropical Agriculture (in Panama)
Biol 331 (3) Ecology/Behavior Field Course (at Mont St. Hilaire)
Biol 553 (3) Neotropical Environments (in Panama)
GEOG 300 (3) Human Ecology in Geography
GEOG 302 (3) Environmental Management 1
GEOG 404 (3) Environmental Management 2 (in Panama)
GEOG 494 (3) Urban Field Studies
GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)
GEOG 493 (3) Subarctic Field Studies (in Schefferville)
MIME 451 (3) Environmental Controls: Methyl Plants
PLNT 460 (3) Plant Ecology (M)

WILD 333 (3) Physical and Biological Aspects of Pollution (M)
WILD 401 (4) Fisheries and Wildlife Management (M)
WOOD 300 (3) Urban Forests and Trees (M)
WOOD 420 (3) Environmental Issues: Forestry (M)
ZOOL 313 (3) Zoogeography (M)

6.4 Food Production and Environment Domain

This Domain (66 credits including Core) is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc in Environment program.

Adviser: Professor Danielle Donnelly
Telephone: (514) 398-7851 ext. 7856

The business of food production is an area of human activity with a long and intimate interaction with the environment. Modern agriculturists must strike a delicate balance between trying to provide food for themselves, their families and urban dwellers while trying to minimize environmental damage. When negative effects due to agricultural activities do occur, they are not usually the classic point source effects that we have come to associate with industry or large cities. Rather, the effects are over extremely large land areas, cumulating perhaps, in pollution of river systems or lakes some distance away. As world populations grow, and as diets change, potentially negative interactions between agricultural systems and other facets of the environment will become more frequent. In the same way, urban sprawl will make conflicts between agriculture and urbanites more common.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

Recommended Prerequisite or Corequisite Courses for Domain
FDSC 211 (3) Biochemistry 1 (M)
or BIOL 112 (3) Cell and Molecular Biology
or CEGEP equivalent (e.g., CEGEP objective 00XV)
FDSC 230 (4) Organic Chemistry (M)
or CHEM 212 (4) Introductory Organic Chemistry 1
or CEGEP equivalent (e.g., CEGEP objective 00XV)

NOTE: Students are required to take a maximum of 34 credits at the 200 level and a minimum of 15 credits at the 400 level or higher in this program. This includes Core and Required courses, but does not include the Domain prerequisites or corequisites listed above.

Core: Required Courses (18 credits)
ENVR 200 (3) The Global Environment
ENVR 201 (3) Society and Environment
ENVR 202 (3) The Evolving Earth
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project
(3 credits*)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Courses (12 credits)
AGRI 210 (3) Agro-Ecological History (M)
PLNT 211 (3) Principles of Plant Science (M)
PLNT 300 (3) Cropping Systems (M)
WILD 375 (3) Issues: Environmental Sciences (M)
6.5 Land Surface Processes and Environmental Change Domain

This Domain (63 credits including Core) is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.

Adviser: Mr. Pete Barry, MSE Program Coordinator  
E-mail: info.mse@mcgill.ca  
Telephone: (514) 398-4306

The thin soil layer on the planet's land surfaces controls the vital inputs of water, nutrients and energy to terrestrial and freshwater aquatic ecosystems. Widespread occurrences around the globe of desertification, soil erosion, deforestation and land submergence over water reservoirs indicate that this dynamic system is under increasing pressure from population growth and changes in climate and land uses. Production of key greenhouse gases (water vapor, CO2, and methane) is controlled by complex processes operating at the land surface, involving climate change feedbacks that need to be fully understood, given current global warming trends.

The program introduces students to the interacting physical and biochemical processes at the atmosphere-lithosphere interface, which fashion land surface habitats and determine their biophysical productivity and response to anthropogenic or natural environmental changes. Through an appropriate selection of courses, students can prepare for graduate training in emerging research areas such as earth system sciences, environmental hydrology and landscape ecology.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

NOTE: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses.

Core: Required Courses (18 credits)
- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 301 (3) Environmental Research Design
- ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project (3 credits*)
- ENVR 401 (3) Environmental Research
- ENVR 451 (6) Research in Panama (in Panama)
- ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Course (3 credits)
- GEOG 203 (3) Environmental Systems

Domain: Complementary Courses (39 credits)
- 3 credits of statistics chosen from:  
  - AEMA 310 (3) Statistical Methods 1 (M)
  - or GEOG 202 (3) Statistics and Spatial Analysis
  - or MATH 203 (3) Principles of Statistics

- 3 credits of ecology chosen from:  
  - BIOL 208 (3) Introduction to Ecology
  - or AEBI 205 (3) Principles of Ecology

- 3 credits of weather and climate chosen from:  
  - ATOC 215 (3) Weather Systems and Climate
  - or AEPH 201 (3) Introductory Meteorology (M)
9 credits of fundamental land surface processes chosen from:
- AGRI 272 (3) Earth’s Changing Surface
- or SOIL 200 (3) Introduction to Earth Science *(M)*
- GEOG 305 (3) Soils and Environment
- or SOIL 326 (3) Soil Genesis and Classification *(M)*
- GEOG 321 (3) Climatic Environments
- or GEOG 322 (3) Environmental Hydrology
- or ABEN 217 (3) Hydrology and Drainage *(M)*

3 credits of environment and resource management chosen from:
- AGRI 435 (3) Soil and Water Quality Management *(M)*
- AGRI 550 (3) Sustained Tropical Agriculture (in Panama)
- BIOL 465 (3) Conservation Biology
- BIOL 535 (3) Political Ecology
- BIOL 560 (3) Aquatic Conservation
- CHEE 240 (3) Environmental Aspects of Technology
- CIVE 250 (4) Environmental Engineering
- GEOG 302 (3) Environmental Management 1
- GEOG 404 (3) Environmental Management 2 (in Panama)
- WILD 437 (3) Assessing Environmental Impact *(M)*
- WOOD 420 (3) Environmental Issues: Forestry *(M)*
- WOOD 441 (3) Integrated Forest Management *(M)*

3 credits of a field course chosen from:
- BIOL 553 (3) Neotropical Environments (in Panama)
- GEOG 496 (3) Geographical Excursion (in Barbados)
- GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)
- GEOG 499 (3) Arctic Field Studies (in Schefferville)
- NRSC 382 (3) Ecological Monitoring and Analysis *(M)*
- WILD 475 (3) Desert Ecology (in Arizona)

3 credits of social science issues chosen from:
- ANTH 339 (3) Ecological Anthropology
- ECON 225 (3) Economics of the Environment
- ECON 326 (3) Ecological Economics
- ECON 405 (3) Natural Resource Economics
- or AGEC 333 (3) Resource Economics *(M)*
- ENVR 466 (3) Research in Atlantic Canada (at Bay of Fundy)
- GEG 408 (3) Geography of Development
- GEG 498 (3) Humans in Tropical Environments (in Panama)
- GEOG 508 (3) Resources, People and Power
- SOCI 328 (3) Environmental Sociology
- SOCI 565 (3) Social Change in Panama (in Panama)

12 credits total of advanced studies chosen from the following two lists:

3 credits minimum of advanced study of particular environments:
- BIOL 358 (3) Canadian Flora
- or PLNT 358 (3) Flowering Plant Diversity *(M)*
- BIOL 432 (3) Limnology
- or ZOOL 315 (3) Science of Inland Waters *(M)*
- GEOG 350 (3) Ecological Biogeography
- GEOG 372 (3) Running Water Environments
- GEOG 470 (3) Wetlands
- GEOG 536 (3) Geocryology
- GEOG 550 (3) Quaternary Paleecology
- PLNT 460 (3) Plant Ecology *(M)*
- WOOD 410 (3) The Forest Ecosystem *(M)*

6 credits minimum of advanced study of surface processes:
- ABEN 509 (2) Hydrologic Systems and Modelling *(M)*
- ATOC 315 (3) Water in the Atmosphere
- EPS 401 (3) Advanced Environmental Geology
- EPS 499 (3) Hydrogeology
- EPS 580 (3) Aqueous Geochemistry
- GEG 501 (3) Modelling Environmental Systems
- GEG 505 (3) Global Biogeochemistry
- GEG 522 (3) Advanced Environmental Hydrology

- GEOG 537 (3) Advanced Fluvial Geomorphology
- SOIL 410 (3) Soil Chemistry *(M)*
- WILD 333 (3) Physical and Biological Aspects of Pollution *(M)*

6.6 Renewable Resource Management Domain

This Domain (63 credits including Core) is open only to students in the B.Sc. B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.

Adviser: Professor Joann Whalen
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Telephone: (514) 398-7943

Renewable resource management is an emerging field that focuses on the ecosystem structures and processes required to sustain the delivery, to humanity, of ecosystem goods and services such as food, clean water and air, essential nutrients, and the provision of beauty and inspiration. Renewable resource management recognizes humans as integral components of ecosystems and is used to develop goals that are consistent with sustainability and ecosystem maintenance.

The Renewable Resource Management domain provides students with an understanding of: 1) the interactions between physical and biological factors that determine the nature and dynamics of populations and entities in the natural environment; 2) the ways in which ecosystems can be managed to meet specific goals for the provision of goods and services; 3) the economic and social factors that determine how ecosystems are managed; 4) the ways in which management of natural resources can affect the capability of natural ecosystems to continue to supply human needs in perpetuity; and 5) the approaches and technologies required to monitor and analyze the dynamics of natural and managed ecosystems.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an *(M).* (Introductory Core Courses are offered on both campuses.)

Recommended Prerequisite or Corequisite Courses for Domain
- FDSC 211 (3) Biochemistry 1 *(M)*
- or BIOL 112 (3) Cell and Molecular Biology
- or CEGEP equivalent (e.g., CEGEP objective 00XU)
- FDSC 230 (4) Organic Chemistry *(M)*
- or CHEM 212 (4) Introductory Organic Chemistry 1
- or CEGEP equivalent (e.g., CEGEP objective 00XV)

NOTE: Students are required to take a maximum of 20 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses, but does not include the Domain prerequisites or corequisites listed above.

Core: Required Courses (18 credits)
- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 301 (3) Environmental Research Design
- ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project

(3 credits*)
- ENVR 401 (3) Environmental Research
- ENVR 451 (6) Research in Panama (in Panama)
- ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.
Domain: Complementary Courses (42 credits)

9 credits basic principles of ecosystem processes and diversity
AEBI 200 (3) Biology of Organisms (M)
or BIOL 305 (3) Diversity of Life
or PLNT 201 (3) Comparative Plant Biology (M)
AEBI 205 (3) Principles of Ecology (M)
or BIOL 208 (3) Introduction to Ecology
GEOG 305 (3) Soils and Environment
or SOIL 210 (3) Principles of Soil Science (M)

6 credits statistics and GIS methods
ABEN 330 (3) GIS for Biosystems Engineering (M)
or GEOG 201 (3) Introductory Geo-Information Science
AEMA 310 (3) Statistical Methods 1 (M)
or BIOL 373 (3) Biometry

6 credits advanced ecosystem components
PLNT 358 (3) Flowering Plant Diversity (M)
or BIOL 358 (3) Canadian Flora
BIOL 553 (3) Neotropical Environments (in Panama)
SOIL 326 (3) Soil Genesis and Classification (M)
ZOOI 307 (3) Natural History of Vertebrates (M)

6 credits advanced ecological processes
ABEN 217 (3) Hydrology and Drainage (M)
or GEOG 322 (3) Environmental Hydrology
BIOL 432 (3) Limnology
or ZOOI 315 (3) Science of Inland Waters (M)
BIOL 465 (3) Conservation Biology
GEOG 372 (3) Running Water Environments
GEOG 470 (3) Wetlands
GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)
MICR 331 (3) Microbial Ecology (M)
PLNT 460 (3) Plant Ecology (M)
WILD 410 (3) Wildlife Ecology (M)
WOOD 410 (3) The Forest Ecosystem (M)

6 credits social processes:
AGEC 242 (3) Management Theories and Practices (M)
AGEC 333 (3) Resource Economics (M)
or ECON 405 (3) Natural Resource Economics
ANTH 339 (3) Ecological Anthropology
CANS 407 (3) Understanding Atlantic Canada (at Bay of Fundy)

ENVR 465 (3) Environment and Social Change (at Bay of Fundy)
GEOG 498 (3) Humans in Tropical Environments (in Panama)
RELG 270 (3) Religious Ethics and the Environment
SOCI 328 (3) Environmental Sociology
SOCI 365 (3) Social Change in Panama (in Panama)
WILD 415 (2) Conservation Law

9 credits ecosystem components or management of ecosystems:
AGRI 435 (3) Soil and Water Quality Management (M)
AGRI 550 (3) Sustained Tropical Agriculture (in Panama)
BIOL 470 (3) Lake Management
GEOG 302 (3) Environmental Management 1
GEOG 404 (3) Environmental Management 2 (in Panama)
PLNT 300 (3) Cropping Systems (M)
SOIL 335 (3) Soil Ecology and Management (M)
WILD 401 (4) Fisheries and Wildlife Management (M)
WILD 437 (3) Assessing Environmental Impact (M)
WOOD 441 (3) Integrated Forest Management (M)

Those electing the biological stream will concentrate on the mechanisms regulating the different forms of life in water bodies. They will acquire, as well, a good understanding of the physical mechanisms controlling water properties.

Students interested in studying the transport and transformation mechanisms of water on the planet, from rivers to the oceans and atmosphere, will select the physical stream. They will acquire, as well, a solid background in the biological processes taking place in water bodies.

Graduates of this Domain are qualified to enter the work force or to pursue advanced studies in fields such as marine biology, geography, physical oceanography and atmospheric science.

Water Environments and Ecosystems Domain – Biological Stream

This Domain (57 credits including Core) is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.

Adviser: Mr. Pete Barry, MSE Program Coordinator
E-mail: info.mse@mcgill.ca
Telephone: (514) 398-4306

NOTE: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses.

Core: Required Courses (18 credits)
ENVR 200 (3) The Global Environment
ENVR 201 (3) Society and Environment
ENVR 202 (3) The Evolving Earth
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project (3 credits*)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Course (3 credits)
ATOC 310 (3) Physical Oceanography

Domain: Complementary Courses (33 credits)
6 credits chosen from:
AEBI 205 (3) Principles of Ecology (M)
or BIOL 208 (3) Introduction to Ecology
AEBI 217 (3) Hydrology and Drainage (M)
or GEOG 322 (3) Environmental Hydrology

3 credits of math and statistics from:
AEMA 202 (3) Calculus (M)
AEMA 310 (3) Statistical Methods 1 (or equivalent) (M)
MATH 203 (3) Principles of Statistics 1
MATH 222 (3) Calculus 3

3 credits chosen from:
BIOL 331 (3) Ecology/Behaviour Field Course (at Mont St. Hilaire)
GEOG 495 (3) Field Studies - Physical Geography (at Mont St. Hilaire)
GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy)
or an equivalent aquatic field course

3 credits chosen from:
AGEC 333 (3) Resource Economics (M)
ANTH 339 (3) Ecological Anthropology
ANH 418 (3) Environment and Development
ECON 225 (3) Economics of the Environment
ECON 326 (3) Ecological Economics
ENVR 465 (3) Environment and Social Change (at Bay of Fundy)
GEOG 404 (3) Environmental Management 1 (in Panama)
GEOG 498 (3) Humans in Tropical Environments (in Panama)
POLI 345 (3) International Organization
POLI 466 (3) Public Policy Analysis
SOCL 565 (3) Social Change in Panama (in Panama)

18 credits, minimum, from lists A and B below

List A, 9 to 12 credits chosen from:
AGRI 435 (3) Soil and Water Quality Management (M)
BIOL 432 (3) Limnology
BIOL 441 (3) Biological Oceanography
BIOL 442 (3) Marine Biology
BIOL 553 (3) Neotropical Environments (in Panama)
BIOL 560 (3) Aquatic Conservation
BIOL 570 (3) Advanced Seminar in Evolution
ENTO 535 (3) Aquatic Entomology (M)
GEOG 305 (3) Soils and Environment
or SOIL 210 (3) Principles of Soil Science (M)
GEOG 350 (3) Ecological Biogeography
MICR 331 (3) Microbial Ecology (M)
PARA 410 (3) Environment and Infection (M)
WILD 333 (3) Physical and Biological Aspects of Pollution (M)
WILD 401 (4) Fisheries and Wildlife Management (M)
ZOOL 315 (3) Science of Inland Waters (M)

List B, 6 to 10 credits chosen from:
ABEN 330 (3) GIS for Biosystems Engineering (M)
ATOC 215 (3) Weather Systems and Climate
ATOC 308 (3) Principles of Remote Sensing
or GEOG 308 (3) Principles of Remote Sensing
ATOC 310 (3) Physical Oceanography
ATOC 330 (3) Physical Meteorology
ATOC 219 (3) Introduction to Atmospheric Chemistry
or CHEM 219 (3) Introduction to Atmospheric Chemistry
ATOC 419 (3) Advances in Chemistry of Atmosphere
or CHEM 419 (3) Advances in Chemistry of Atmosphere
CHEM 257D1 (2) Introductory Analytical Chemistry
CHEM 257D2 (2) Introductory Analytical Chemistry
EPSC 220 (3) Principles of Geochemistry
GEOL 201 (3) Introductory Geo-Information Science
GEOL 372 (3) Running Water Environments
GEOL 522 (3) Advanced Environmental Hydrology
GEOL 537 (3) Advanced Fluvial Geomorphology
GEOL 550 (3) Quaternary Paleoeocology

Water Environments and Ecosystems Domain – Physical Stream
This Domain (60 credits including Core) is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.
Adviser: Professor Peter Yau
E-mail: yau@rainband.meteo.mcgill.ca
Telephone: (514) 398-3719

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)

Recommended Corequisite Course for Domain
MATH 222 (3) Calculus 3
or CEGEP Mathematics 201-301 or equivalent

NOTE: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses, but does not include the Domain prerequisites or corequisites listed above.

Core: Required Courses (18 credits)
ENVR 200 (3) The Global Environment
ENVR 201 (3) Society and Environment
ENVR 202 (3) The Evolving Earth
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project
(3 credits*)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)
* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Courses (9 credits)
ATOC 310 (3) Physical Oceanography
ATOC 315 (3) Water in the Atmosphere
GEOG 372 (3) Running Water Environments

Domain – Complementary Courses (30 credits)
6 credits chosen from:
ABEN 205 (3) Principles of Ecology (M)
or BIOL 208 (3) Introduction to Ecology
ABEN 217 (3) Hydrology and Drainage (M)
or GEOG 322 (3) Environmental Hydrology
3 credits of statistics or calculus:
AEMA 310 (3) Statistical Methods 1 (or equivalent) (M)
AEMA 202 (3) Calculus (M)
MATH 203 (3) Principles of Statistics 1
MATH 222 (3) Calculus 3
12 credits chosen from:
ABEN 330 (3) GIS for Biosystems Engineering (M)
or GEOG 306 (3) Raster Geo-Information Science
ABEN 416 (3) Engineering for Land Development (M)
ABEN 506 (3) Advances in Drainage Management (M)
or ABEN 509 (3) Hydrologic Systems and Modelling (M)
or GEOG 522 (3) Advanced Environmental Hydrology
AEMA 205 (3) Differential Equations (M)
or MATH 315 (3) Ordinary Differential Equations
AEPH 510 (3) Agricultural Micrometeorology (M)
AGRI 435 (3) Soil and Water Quality Management (M)
or BIOL 441 (3) Biological Oceanography
ATOC 215 (3) Weather Systems and Climate
ATOC 308 (3) Principles of Remote Sensing
or GEOG 308 (3) Principles of Remote Sensing
ATOC 402 (3) Atmosphere-Ocean Transports
ATOC 414 (3) Applications of Remote Sensing
ATOC 568 (3) Ocean Physics
CIVE 323 (3) Hydrology and Water Resources
EPSC 549 (3) Hydrogeology
GEOG 201 (3) Introductory Geo-Information Science
GEOG 537 (3) Advanced Fluvial Geomorphology
GEOG 305 (3) Soils and Environment
or SOIL 210 (3) Principles of Soil Science (M)

6 credits chosen from:
BIOL 432 (3) Limnology
or BIOL 441 (3) Biological Oceanography
or ZOOL 315 (3) Science of Inland Waters (M)
BIOL 442 (3) Marine Biology
BIOL 473 (3) Ecology of Aquatic Invertebrates
BIOL 553 (3) Neotropical Environments (in Panama)
BIOL 560 (3) Aquatic Conservation
GEOG 350 (3) Ecological Biogeography
GEOG 505 (3) Global Biogeochecmy
WILD 401 (4) Fisheries and Wildlife Management (M)
3 credits of field courses
GEOG 495 (3) Field Studies - Physical Geography (at Mont St. Hilaire)
GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy) or an equivalent aquatic field course

7 Major Program in Environment – B.Sc.

In addition to the selection of Domains available to students in the Major program in either the Faculty of Science or the Faculty of Agricultural and Environmental Sciences, see section 6 “Major Program in Environment – B.Sc.(Ag.Env.Sc.) and B.Sc.”, students in the Faculty of Science program can choose from one of the two Domains limited to Science students only:
- Atmospheric Environment and Air Quality, or
- Earth Sciences and Economics.

Refer to section 6 “Major Program in Environment – B.Sc.(Ag.Env.Sc.) and B.Sc.”, for the general guidelines and regulations which apply to all Domains in the Major in Environment program.

7.1 Atmospheric Environment and Air Quality Domain

This Domain (60 credits including Core) is open only to students in the B.Sc. Major in Environment program in the Faculty of Science.

Adviser: Professor Peter Yau
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Telephone: (514) 398-3719

The rapid expansion of industrialization has been accompanied with a host of environmental problems, many, if not most, involve the atmosphere. Some problems are of a local nature, such as air pollution in large urban centres, while others are global, or at least reach areas far removed from industrial activities.

The emphasis in this Domain is on the mechanisms of atmospheric flow and on atmospheric chemistry. Courses examine how the atmosphere transports pollution, lifting it to great heights into the stratosphere or keeping it trapped near the ground, moving it around the globe or imprisoning it locally, or how it simply cleanses itself of the pollution through rainfall. The Domain also gives students the training required to understand the important chemical reactions taking place within the atmosphere, as well as the knowledge necessary to measure and analyze atmospheric constituents.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

NOTE: Students are required to take a maximum of 31 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses.

Core: Required Courses (18 credits)
ENVR 200 (3) The Global Environment
ENVR 201 (3) Society and Environment
ENVR 202 (3) The Evolving Earth
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 301 (3) Environmental Research Design
ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project (3 credits)
ENVR 401 (3) Environmental Research
ENVR 451 (6) Research in Panama (in Panama)
ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)

* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Courses (18 credits)
ATOC 214 (3) Introduction: Physics of the Atmosphere
ATOC 219 (3) Introduction to Atmospheric Chemistry
or CHEM 219 (3) Introduction to Atmospheric Chemistry
ATOC 308 (3) Principles of Remote Sensing
or GEOG 308 (3) Principles of Remote Sensing
ATOC 315 (3) Water in the Atmosphere
ATOC 402 (3) Atmosphere-Ocean Transports
CHEM 307 (3) Analytical Chemistry of Pollutants

Domain: Complementary Courses (21 credits)

6 credits from:
CHEM 257D1 (2) Introductory Analytical Chemistry
CHEM 257D2 (2) Introductory Analytical Chemistry
or FDSC 213 (3) Analytical Chemistry 1 (M)
MATH 222 (3) Calculus 3
or AEMA 202 (3) Calculus (M)

3 credits from:
MATH 203 (3) Principles of Statistics 1
or AEMA 310 (3) Statistical Methods 1 (M)
or equivalent

9 credits of math or physical science (at least 6 credits of which are at the 300 level or above):
AEPH 510 (3) Agricultural Micrometeorology (M)
ATOC 215 (3) Weather Systems and Climate
ATOC 419 (3) Advances in Chemistry of Atmosphere
or CHEM 419 (3) Advances in Chemistry of Atmosphere
ATOC 515 (3) Turbulence in Atmosphere and Oceans
ATOC 540 (3) Synoptic Meteorology 1
CHEE 230 (3) Environmental Aspects of Technology
CHM 273 (1) Chemical Kinetics
CHEM 377 (3) Instrumental Analysis 2
CIVE 225 (4) Environmental Engineering
COMP 208 (3) Computers in Engineering
GEOG 505 (3) Global Biogeochemistry
MATH 223 (3) Linear Algebra
MATH 315 (3) Ordinary Differential Equations
or AEMA 205 (4) Differential Equations (M)
WILD 333 (3) Physical and Biological Aspects of Pollution(M)

3 credits of social science:
ANTH 206 (3) Environment and Culture
ANTH 418 (3) Environment and Development
CMPL 580 (3) Environment and the Law
ECON 225 (3) Economics of the Environment
ECON 347 (3) Economics of Climate Change
ENVR 465 (3) Environment and Social Change (in Bay of Fundy)
GEOG 302 (3) Environmental Management 1
GEOG 404 (3) Environmental Management 2 (in Panama or in Africa)
GEOG 498 (3) Humans in Tropical Environments (in Panama)
POLI 466 (3) Public Policy Analysis
RELG 270 (3) Religious Ethics and the Environment

7.2 Earth Sciences and Economics Domain

This Domain (66 credits including Core) is open only to students in the B.Sc. Major in Environment program in the Faculty of Science.

Adviser: Professor Don Baker
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Telephone: (514) 398-7485

The resources necessary for human society are extracted from the Earth, used as raw materials in our factories and refineries, and then returned to the Earth as waste. Geological processes produce resources humans depend on, and they also determine the fate of wastes in the environment. Understanding Earth's geologic
processes provides us with the knowledge to mitigate many of our society’s environmental impacts due to resource extraction and waste disposal. Additionally, economics frequently affects what energy sources power our society and how our wastes are treated. Earth sciences and economics are essential for our understanding of the many mechanisms, both physical and social, that affect Earth’s environment.

This Domain includes the fundamentals of each discipline. Students learn of minerals, rocks, soils, and waters and how these materials interact with each other and with the atmosphere. Fundamental economic theory and the economic effects of public policy towards resource industries, methods of waste disposal, and the potential effects of global warming on the global economy are also explored.

Course descriptions and prerequisites can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva.

Courses offered at Macdonald Campus are marked with an (M). (Introductory Core courses are offered on both campuses.)

NOTE: Students are required to take a maximum of 34 credits at the 200 level and a minimum of 15 credits at the 400 level or higher in this program. This includes Core and Required courses.

Core: Required Courses (18 credits)
- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 301 (3) Environmental Research Design
- ENVR 400 (3) Environmental Thought

Core: Complementary Course – Senior Research Project (3 credits*)
- ENVR 401 (3) Environmental Research
- ENVR 451 (6) Research in Panama (in Panama)
- ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)
* Only 3 credits will be applied to the program; extra credits will count as electives.

Domain: Required Courses (22 credits)
- ECON 230D1 (3) Microeconomic Theory
- ECON 230D2 (3) Microeconomic Theory
- ECON 405 (3) Natural Resource Economics
- EPSC 210 (3) Introductory Mineralogy
- EPSC 212 (4) Introductory Petrology
- EPSC 220 (3) Principles of Geochemistry
- EPSC 425 (3) Sediments to Sequences

Domain: Complementary Courses (23 credits)
- AEAM 310 (3) Statistical Methods 1 (M)
- or GEOG 202 (3) Statistics and Spatial Analysis
- or MATH 203 (3) Principles of Statistics 1
- 12 credits from List A
- AGEC 333 (3) Resource Economics (M)
- BIOL 208 (3) Introduction to Ecology
- or AEAM 310 (3) Principles of Ecology (M)
- CHEE 430 (3) Technology Impact Assessment
- or WILD 437 (3) Assessing Environmental Impact (M)
- ECON 326 (3) Ecological Economics
- ECON 347 (3) Economics of Climate Change
- ECON 416 (3) Topics in Economic Development 2
- ECON 525 (3) Project Analysis
- 8 credits, minimum, from List B
- AGR 435 (3) Soil and Water Quality Management (M)
- ANTH 339 (3) Ecological Anthropology
- BIOL 305 (3) Diversity of Life
- BIOL 553 (3) Neotropical Environments (in Panama)
- ECON 305 (3) Industrial Organization

8 Diploma in Environment

Adviser: Mr. Pete Barry, MSE Program Coordinator
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Telephone: (514) 398-4306

The Diploma is designed for students with an undergraduate degree who wish to enrich or reorient their training, supplementing their specialization with additional undergraduate level course work. The Diploma requires 30 credits of full-time or part-time studies at McGill; it may be started in either January or September. The Diploma is a one-year program if taken full-time.

Students holding a B.Sc. or a B.A. degree or equivalent in good standing, will be permitted to register for the Diploma through the Faculty of Agricultural and Environmental Sciences, the Faculty of Arts, or the Faculty of Science, provided they are otherwise acceptable for admission to the University.

Students must have a grade of C or higher in all courses for the Diploma.

DIPLOMA IN ENVIRONMENT (30 credits)

Required Courses (15 credits)
- ENVR 200 (3) The Global Environment
- ENVR 201 (3) Society and Environment
- ENVR 202 (3) The Evolving Earth
- ENVR 203 (3) Knowledge, Ethics and Environment
- ENVR 400 (3) Environmental Thought

Complementary Courses (15 credits)
- 6 credits from:
  - ENVR 301 (3) Environmental Research Design
  - ENVR 401 (3) Environmental Research
  - ENVR 451 (6) Research in Panama (in Panama)
  - ENVR 466 (6) Research in Atlantic Canada (at Bay of Fundy)
- 9 credits from Thematic Categories*:
  - 3 credits must be taken within the thematic area outside the area of the student’s previous degree (e.g., those with a B.A. or equivalent degree must take 6 credits from the Natural Sciences and Technology list; those with a B.Sc. or equivalent degree must take 6 credits from the Social Sciences and Policy list.)
  - 6 credits must be taken at the 400 level or higher in the thematic area of the student’s previous degree (e.g., those with a B.A. or equivalent degree must take 6 credits at the 400 level or higher in Social Sciences and Policy; those with a B.Sc. or equivalent degree must take 6 credits at the 400 level or higher in Natural Sciences and Technology.)

* See section 10 “List of approved Thematic Category Courses for the Minor and the Diploma”. Course descriptions and prerequisites
can be found in the Courses section. The most up-to-date information on courses being offered this academic year is available on the McGill School of Environment website.

9 Field Studies

9.1 African Field Study Semester

The Department of Geography, Faculty of Science, coordinates the 15-credit interdisciplinary African Field Study Semester, see page 276. Note: The AFSS will only be offered in 2003-04 pending approval by the Dean of Science.

9.2 Panama Field Study Semester

Website: www.mcgill.ca/mse/field_study/panama

This program is a joint venture between McGill University and the Smithsonian Tropical Research Institute (STRI) in Panama.

Hands-on experience is gained through a research project organized around multidisciplinary environmental issues. The nature of these projects will center on practical environmental problems/questions important for Panama. Students will form a team that will work with Panamanian institutions (NGO, governmental or research).

There is one week of transition and 12 weeks of course attendance in Panama. Field trips will be integrated into each of the courses offered.

Offered: Winter Term.

Location: Offered at Smithsonian Tropical Research Institute (STRI) in Panama.

Enrolment Limit: 25 students.

Fees: Approximately $4000CDN – excludes regular McGill fees, airfare, food, and insurance; includes lodging.

Quebec residents may be eligible for a financial subsidy from the Ministry of Education, see “Quebec Government Awards for Quebec Residents” on page 37.


Application Details: Students must submit a letter of intent, CV, and copy of their transcript to: Susan Gabe, Biology Undergraduate Office, Stewart Biology Building room W4/8, Downtown Campus. E-mail: susan.gabe@mcgill.ca. Telephone: (514) 398-7045.

Prerequisites: HISP 218 Spanish Language Elementary or equivalent proficiency, and MATH 203 Principles of Statistics 1 or equivalent. A GPA of 3.00 and higher is recommended. The program is aimed at undergraduate students in their final year.

PANAMA FIELD STUDY SEMESTER – offered Winter Term (15 credits)

Required Courses (9 credits)

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

Complementary Courses (6 credits)

One of the following sets:

Offered in Winter 2004 –
AGRI 550 (3) Sustained Tropical Agriculture
GEOG 498 (3) Humans in Tropical Environments

Offered in Winter 2005 –
GEOG 404 (3) Environmental Management 2
SOCI 565 (3) Social Change in Panama

9.3 Bay of Fundy Field Study Semester

Website: www.geog.mcgill.ca/fieldsemester.html

The focus of this program is environmental and social change on the Bay of Fundy, situated between southern New Brunswick and western Nova Scotia. The program is based at the Huntsman Marine Science Centre in Saint Andrews, New Brunswick.

Students will take three intensive courses followed by a research project related to regional environmental issues. Courses will cover the ecology of the coastal environments which provide important resources; the historical context of current social, political, economic and environmental issues in Atlantic Canada; and how development of new technologies for resource exploitation and globalization of local economies are having dramatic impacts on small coastal communities. Courses rely heavily on field work and interaction with local experts and stakeholders. Student research projects will be arranged with Federal, Provincial and non-governmental agencies.

Offered: Fall Term in alternate years, i.e., 2003, 2005, etc.

Location: Offered at Huntsman Marine Science Centre in St. Andrews, New Brunswick.

Fees: Approximately $4700CDN – excludes regular McGill fees, transportation to Huntsman; includes lodging, food and field trip related expenses.

Quebec residents may be eligible for a financial subsidy from the Ministry of Education, see “Quebec Government Awards for Quebec Residents” on page 37.

Application Deadline: March 1, 2003 for September 2003 (Fall Term of the academic year 2003-04).

Application Details: Students must submit an application (available for download from the program Website) and a copy of their transcript to: Professor Gail Chmura, Department of Geography, Burnside Hall room 705, Downtown Campus. E-mail: chmura@geog.mcgill.ca. Telephone: (514) 398-7437.

Prerequisites: The program is for upper-level students with a GPA of at least 3.00.

BAY OF FUNDY FIELD STUDY SEMESTER – offered Fall Term

Required Courses (15 credits)

CANS 407 (3) Understanding Atlantic Canada
ENVR 465 (3) Environment and Social Change
ENVR 466 (6) Research in Atlantic Canada
GEOG 497 (3) Ecology of Coastal Waters

9.4 Macdonald Campus Summer Field Study

Human Impacts on the Environment

Courses are available during Summer Session that provide students the opportunity to participate in supervised field research concerning flora and fauna not easily studied at other times of the year, and to apply knowledge from the classroom to environmental issues in the field. Common thematic elements include: the linkages between physical, biological and human systems, field research, and human impacts on the environment. Students learn and apply research techniques and analytical skills within a multidisciplinary, holistic approach.

For more information, see ‘Macdonald Summer Field Semester: Human Impacts on the Environment’ on page 318 under the Faculty of Agricultural and Environmental Sciences, the Faculty Website at www.mcgill.ca/macdonald/ programs, the 2003 Summer Studies Calendar or their Website at www.mcgill.ca/summer.
10 List of approved Thematic Category Courses for the Minor and the Diploma

Notes:
1. This list is not meant to be exclusive. Courses not on the list may be included in the Minor or Diploma with the permission of the MSE Program Coordinator.
2. Most courses listed at the 300 level and higher have prerequisites. Although instructors may waive prerequisites in some cases, students are urged to prepare their program of study well before their final year.
3. Not all courses are available in any given year. The most up-to-date information on courses being offered this academic year is available on Class Schedule at www.mcgill.ca/minerva. Course descriptions and prerequisites can be found in the Courses section.

SOCIAL SCIENCES AND POLICY

Anthropology
ANTH 206 (3) Environment and Culture
ANTH 212 (3) Anthropology of Development
ANTH 339 (3) Ecological Anthropology

Economics
ECON 205 (3) An Introduction to Political Economy
ECON 225 (3) Economics of the Environment
ECON 326 (3) Ecological Economics
ECON 347 (3) Economics of Climate Change
ECON 405 (3) Natural Resource Economics

Environment
ENVR 201 (3) Society and Environment
ENVR 203 (3) Knowledge, Ethics and Environment
ENVR 400 (3) Environmental Thought

Geography
GEOG 200 (3) Geographical Perspectives: World Environmental Problems
GEOG 216 (3) Geography of the World Economy
GEOG 300 (3) Human Ecology in Geography
GEOG 301 (3) Geography of Nunavut
GEOG 302 (3) Environmental Management 1
GEOG 410 (3) Geography of Underdevelopment: Current Problems

Law
Students must complete the Special Student application form at the Faculty of Law, and must also provide the Law Faculty with a C.V., a transcript, and a letter stating why they want to take the course. Students should also speak with the professor of the course in question.
CMPL 508 (2) Research Seminars (Several are available, check the Law Calendar for details.)
CMPL 580 (3) Environment and the Law

Philosophy
PHIL 230 (3) Introduction to Moral Philosophy 1
PHIL 237 (3) Contemporary Moral Issues
PHIL 334 (3) Ethics 1

Political Science
POLI 211 (3) Comparative Government and Politics
POLI 212 (3) Government and Politics - Developed World
POLI 227 (3) Developing Areas/Introduction
POLI 345 (3) International Organization
POLI 445 (3) IPE: North-South Relations

Psychology
PSYC 215 (3) Social Psychology

Religious Studies
RELG 270 (3) Religious Ethics and the Environment
RELG 370 (3) Human Condition
RELG 376 (3) Religious Ethics

Sociology
SOCI 234 (3) Population and Society
SOCI 235 (3) Technology and Society
SOCI 254 (3) Development and Underdevelopment
SOCI 328 (3) Environmental Sociology
SOCI 366 (3) Social Change in the Caribbean

Agricultural Economics (Macdonald Campus)
AGEC 231 (3) Economic Systems of Agriculture
AGEC 333 (3) Resource Economics
AGEC 430 (3) Agriculture, Food and Resource Policy

Religious Studies (Macdonald Campus)
RELG 270 (3) Religious Ethics and the Environment

Renewable Resources (Macdonald Campus)
WILD 415 (2) Conservation Law

NATURAL SCIENCES AND TECHNOLOGY

Architecture
ARCH 375 (2) Landscape
ARCH 377 (2) Energy, Environment and Buildings
ARCH 378 (3) Site Usage

Atmospheric and Oceanic Sciences
ATOC 210 (3) Introduction to Atmospheric Science
ATOC 215 (3) Weather Systems and Climate
ATOC 220 (3) Introduction to Oceanic Sciences

Biology
BIOL 208 (3) Introduction to Ecology
BIOL 305 (3) Diversity of Life
BIOL 432 (3) Limnology
BIOL 465 (3) Conservation Biology
BIOL 473 (3) Ecology of Aquatic Invertebrates

Chemistry
CHEM 201 (3) Modern Inorganic Chemistry 1
CHEM 212 (4) Introductory Organic Chemistry 1
CHEM 301 (3) Modern Inorganic Chemistry 2
CHEM 307 (3) Analytical Chemistry of Pollutants

Chemical Engineering
CHEE 230 (3) Environmental Aspects of Technology
CHEE 471 (3) Industrial Water Pollution Control
CHEE 472 (3) Industrial Air Pollution Control

Civil Engineering
CIVE 225 (4) Environmental Engineering
CIVE 323 (3) Hydrology and Water Resources
CIVE 526 (3) Solid Waste Management
CIVE 550 (3) Water Resources Management
CIVE 553 (3) Stream Pollution and Control
CIVE 555 (3) Environmental Data Analysis

Computer Science
COMP 102 (3) Computers and Computing (Arts students only)
COMP 202 (3) Introduction to Computing 1
COMP 203 (3) Introduction to Computing 2

Earth and Planetary Sciences
EPSC 233 (3) Earth and Life History
EPSC 243 (3) Environmental Geology
EPSC 425 (3) Sediments to Sequences

Environment
ENVR 200 (3) The Global Environment
ENVR 202 (3) The Evolving Earth

Geography
GEOG 201 (3) Introductory Geo-Information Science
GEOG 205 (3) Global Change: Past, Present and Future
GEOG 272 (3) Earth’s Changing Surface
GEOG 308 (3) Principles of Remote Sensing
GEOG 322 (3) Environmental Hydrology
**Mechanical Engineering**
- MECH 343 (3) Energy Conversion
- MECH 534 (3) Air Pollution Engineering

**Microbiology and Immunology**
- MIMM 211 (3) Introductory Microbiology
- MIMM 314 (3) Immunology
- MIMM 323 (3) Microbial Physiology
- MIMM 324 (3) Fundamental Virology

**Mining, Metals and Materials Engineering**
- MIME 308 (3) Social Impact of Technology
- MIME 320 (3) Extraction of Energy Resources
- MIME 451 (3) Environmental Controls: Met’tl Plants
- MIME 555 (3) Thermal Remediation of Wastes

**Physics**
- PHYS 248 (3) Physics of Energy

**Psychology**
- PSYC 431 (3) Environment and Developing Brain

**Agricultural and Biosystems Engineering (Macdonald Campus)**
- AGRI 435 (3) Soil and Water Quality Management
- ABEN 217 (3) Hydrology and Drainage
- ABEN 322 (3) Food Production/Processing Waste Management
- ABEN 518 (3) Pollution Control for Agriculture

**Biology (Macdonald Campus)**
- AEBI 205 (3) Principles of Ecology
- AEBI 495D1 (1) Environmental Biology Seminar
- AEBI 495D2 (1) Environmental Biology Seminar

**Microbiology (Macdonald Campus)**
- MICR 331 (3) Microbial Ecology

**Physics (Macdonald Campus)**
- AEPH 201 (3) Introductory Meteorology

**Plant Science (Macdonald Campus)**
- PLNT 304 (3) Biology of Fungi
- PLNT 305 (3) Plant Pathology
- PLNT 358 (3) Flowering Plant Diversity
- PLNT 460 (3) Plant Ecology

**Renewable Resources (Macdonald Campus)**
- WILD 333 (3) Physical and Biological Aspects of Pollution
- WILD 375 (3) Issues: Environmental Sciences
- WILD 410 (3) Wildlife Ecology
- WILD 437 (3) Assessing Environmental Impact

**Soil Science (Macdonald Campus)**
- SOIL 200 (3) Introduction to Earth Science

**Zoology (Macdonald Campus)**
- ZOOL 315 (3) Science of Inland Waters