

## Table of Contents

1. The School, page 465
  - 1.1 Location
  - 1.2 Administrative Officers
  - 1.3 Executive Committee
  - 1.4 Creation of the School
  - 1.5 Goals of the School
2. Admission, Registration and Regulations, page 465
  - 2.1 Admission
  - 2.2 Degree Requirements
  - 2.3 Important Information about Program Codes
  - 2.4 Course Numbering System at McGill
  - 2.5 Examination Regulations
3. Programs Offered, page 466
4. Minor in Environment, page 466
  - 4.1 Minor Concentration in Environment
  - 4.2 Minor Program in Environment
5. B.A. Faculty Program in Environment, page 467
  - 5.1 Ecological Determinants of Health in Society Domain
  - 5.2 Environment and Development Domain
6. B.Sc. Major Program in Environment, page 469
  - 6.1 Atmospheric Environment and Air Quality Domain
  - 6.2 Biodiversity and Conservation Domain
  - 6.3 Earth Sciences and Economics Domain
  - 6.4 Ecological Determinants of Health Domain
  - 6.5 Environmetrics Domain
  - 6.6 Food Production and Environment Domain
  - 6.7 Renewable Resource Management Domain
  - 6.8 Water Environments and Ecosystems Domain
7. Panama Field Study Semester, page 476
8. Diploma In Environment, page 477
9. Human Impacts on the Environment Summer Program at Macdonald Campus (Awaiting University Approval), page 477
10. List of Approved Thematic Category Courses for the Minor and the Diploma, page 477
11. Courses, page 478

## 1 The School

### 1.1 Location

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

Downtown Campus  
3534 University Street  
Montreal, QC H3A 2A7  
Telephone: (514) 398-2827  
Fax: (514) 398-1643  
Website: <http://www.mcgill.ca/mse>

For advising, contact:  
Program Coordinator, Mr. Peter Barry  
Telephone: (514) 398-4306  
Fax: (514) 398-1643  
Email: [info@mse.mcgill.ca](mailto:info@mse.mcgill.ca)

### 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**

PETER G. BROWN, B.A.(Hartford), M.A., Ph.D.(C'bia)  
**Director**

MARILYN SCOTT, B.Sc. (U.N.B.), Ph.D.(McG.)  
**Associate Director**

PETER BARRY, B.Sc.(C'dia), M.Sc.(McG.)  
**Program Coordinator**

### 1.3 Executive Committee

Peter Brown (Chair), Faculty of Science  
Jim Finch, Faculty of Engineering  
John Galaty, Faculty of Arts  
Christopher Green, Faculty of Arts  
Tim Johns, Faculty of Agricultural and Environmental  
Sciences  
Al Mucci, Faculty of Science  
Joseph Rasmussen, Faculty of Science  
Marilyn Scott, Faculty of Agricultural and Environmental  
Sciences  
Frances Westley, Faculty of Management

### 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 B.A. or B.Sc. programs 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.

Please refer to "[Admission Requirements](#)" on page 13. In addition, in the case of students entering the B.A. Faculty Program in Environment, the MSE requires, as either a pre- or co-requisite for the core courses, 189-139 Calculus or 189-140 Calculus I (CEGEP course 201-103 – or new equivalent); and one of Biology 177-111, Chemistry 180-110, or Physics

198-101, or their equivalents (CEGEP courses Biology 301, Chemistry 101, or Physics 101, respectively – or new equivalents).

## 2.2 Degree Requirements

To be eligible for a B.A. degree, students must fulfil all the Faculty and program requirements as indicated in Faculty of Arts [section 2](#).

To be eligible for a B.Sc. degree, students must fulfil all the Faculty and program requirements as indicated in Faculty of Science [section 2](#).

**Students enrolled in the Environmental Studies Program prior to September 1998 may continue in that program until they receive their degree. They should refer to the Calendar for the year they entered the program or contact their advisor.**

## 2.3 Important Information about Program Codes

The MSE uses MARS Program Codes to identify which students are in the School's major programs (and, by extension, which students are in the McGill Environmental Students' Society), and the Campus where they are studying. **It is important that students taking the B.A. or B.Sc. Environment programs register on MARS using the Program Codes provided with each Domain description.**

Students can change their Program Codes when and as often as necessary.

Students studying on the Macdonald Campus will only be able to use Macdonald Facilities (libraries, computers) if they use the **Macdonald Program Codes**. This is true even for students spending only one semester at Macdonald Campus.

### Default Codes

Students in U1 who are unsure of the Domain they want to pursue may use the Default Codes given below. The Default Codes can be used for the first year (U1) only. Students must select a Domain Code in order to graduate, they cannot graduate with the Default Code.

The Default Codes are:

B.A. Faculty Program in Environment:  
Downtown 4-412000 or  
Macdonald 4-412050

B.Sc. Major Program in Environment:  
Downtown 1-412000 or  
Macdonald 1-412050

Please contact the Program Coordinator for further information.

**Note:** None of the above applies to students in the Minor or Diploma Programs.

## 2.4 Course Numbering System at McGill

The first three numbers of a McGill course number refer to the department which offers the course. See the table on [page 29](#) of this Calendar for a key to department codes. The second three numbers 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**.

## 3 Programs Offered

The McGill School of Environment has developed four 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; or
- in a more traditional discipline-based program that has an environmental emphasis.

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 four 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 Arts students only.
3. **A Major in Environment** leading to a B.Sc. is open to students meeting the entrance requirements of the Faculty of Science and who obtain 54 credits in approved Science, or Agricultural and Environmental Sciences courses.
4. **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.

## 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 advisor 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 MARS using the Program Code listed below;
- (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

(18 credits) [MARS Program Code 7-412000]

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

##### Complementary Courses (18 credits)

12 credits selected from the MSE core courses:

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(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 "List of Approved Thematic Category Courses for the Minor and the Diploma" on page 477. Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling.

#### 4.2 Minor Program in Environment

(18 credits) [MARS Program Code 6-412000]

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

##### Complementary Courses (18 credits)

12 credits selected from the MSE core courses:

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(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 "List of Approved Thematic Category Courses for the Minor and the Diploma" on page 477. Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling.

### 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. Introductory Core:** The Core consists of four introductory courses 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. Additional Domains are being developed in several areas. More information on these is available on the MSE website (<http://www.mcgill.ca/mse>).
- 3. Final Core:** 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:

- register in a Domain using the MARS Program Codes listed below;
- pass all courses counted towards the Faculty Program 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

- fulfil all Faculty requirements as specified for the B.A. in the Faculty of Arts **section 2** which includes 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 Core courses:

- 3 credits of calculus  
 189-139 Calculus  
 or 189-140 Calculus I  
 or equivalent (CEGEP Math 201-103)

3 credits of basic science chosen from:

- (Awaiting University Approval)  
 177-111 Principles of Organismal Biology  
 or 180-110 General Chemistry - Biological  
 or 198-101 Introductory Physics - Mechanics  
 or their equivalents, (CEGEP courses Biology 301, Chemistry 101, or Physics 101 respectively).

##### Core – Required Courses (18 credits)

The Core courses are listed below in the Domain descriptions.

##### Domain (36 credits)

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

Currently available:

- Environment and Development (36 credits)
- Ecological Determinants of Health in Society (36 credits)

Additional Domains TBA – refer to the MSE website.

Each Domain has different requirements which are listed below. Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling.

#### 5.1 Ecological Determinants of Health in Society Domain

(54 credits including Core) [MARS Program Codes: Downtown 4-412009; Macdonald 4-412059]

This Domain is open only to students in the B.A. Faculty Program in Environment.

Advisor: Professor Tim Johns  
 email: [johns@macdonald.lan.mcgill.ca](mailto:johns@macdonald.lan.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.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

##### Core – Required Courses (18 credits)

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(3)	Environmental Thought
170-401	(3)	Environmental Research

**Prerequisite or Corequisite Course for Domain** (3 credits)

- 177-111 (3) Principles of Organismal Biology  
 or 344-120 (3) General Biology (M)  
 or equivalent (CEGEP Biology 301)

This course can also satisfy 3 credits of the pre/co-requisites for the B.A. Faculty Program in Environment listed above.

**Required Course for Domain** (3 credits)

- 391-410 (3) Environment and Infection (M)

**Complementary Courses for Domain** (33 credits)

Students are required to take a maximum of 18 credits at the 200 level and a minimum of 6 credits at the 400 level or higher.

15 credits chosen from List A:

- 151-227 (3) Medical Anthropology  
 or 375-333 (3) Physical and Biological Aspects of Pollution (M)  
 154-208 (3) Microeconomic Analysis and Applications  
 or 334-200 (3) Principles of Microeconomics (M)  
 166-222 (3) Urban Sociology  
 or 166-234 (3) Population and Society  
 382-200C (3) Contemporary Nutrition  
 or 382-207 (3) Nutrition and Health (M)  
 189-203 (3) Principles of Statistics I  
 or 166-350 (3) Statistics in Social Research  
 or 360-310 (3) Statistical Methods I (M)  
 or equivalent

9 credits chosen from List B:

- 166-254 (3) Development and Underdevelopment  
 or 151-212 (3) Anthropology of Development  
 or 151-339 (3) Ecological Anthropology  
 or 183-300 (3) Human Ecology in Geography  
 336-217 (3) Hydrology and Drainage (M)  
 or 183-321 (3) Climatic Environments  
 or 183-322 (3) Environmental Hydrology  
 or 338-510 (3) Agricultural Micrometeorology (M)  
 177-205 (3) Biology of Organisms  
 or 177-200 (3) Molecular Biology  
 or 177-208 (3) Ecology  
 or 333-211 (3) Biochemistry I (M)  
 or 344-200 (3) Biology of Organisms I (M)  
 or 344-205 (3) Principles of Ecology (M)  
 or 367-201 (3) Comparative Plant Biology (M)  
 or 552-202 (3) Human Physiology: Body Functions  
 330-250 (3) Principles of Ecological Agriculture (M)  
 or 330-210 (3) Agro-Ecological History (M)  
 or 330-411 (3) International Agriculture (M)  
 334-242 (3) Management Theories and Practices (M)  
 or 107-343 (3) Biomedical Ethics  
 or 154-440 (3) Health Economics

9 credits chosen from List C:

- 101-292 (3) History and the Environment  
 or 166-328 (3) Environmental Sociology  
 or 407-374 (3) Community Development / Social Action  
 or 423-461 (3) Society and Change  
 166-520 (3) Migration and Immigrant Groups  
 or 166-550 (3) Sociology of Developing Societies  
 or 183-498 (3) Humans in Tropical Environments (in Panama)  
 or 204-533 (3) International Health Psychology  
 177-365 (3) Conservation Biology  
 or 177-350 (3) Insect Biology and Control  
 or 367-361 (3) Pest Management and the Environment (M)  
 or 350-452 (3) Biocontrol of Insect Pests (M)  
 or 374-410 (3) The Forest Ecosystem (M)  
 or 375-410 (3) Wildlife Ecology (M)  
 528-324 (3) Fundamental Virology  
 or 391-438 (3) Immunology (M)  
 or 528-314 (3) Immunology  
 or 528-413 (3) Parasitology  
 183-201 (3) Geographic Information Systems I  
 or 183-302 (3) Environmental Analysis and Management

- or 302-230 (3) Environmental Aspects of Technology  
 or 336-330 (3) GIS for Biosystems Management (M)

**5.2 Environment and Development Domain**

(54 credits including Core) [MARS Program Codes: Downtown 4-412001; Macdonald 4-412051]

This Domain is open only to students in the B.A. Faculty Program in Environment.

Advisor: Professor Oliver Coomes  
 email: coomes@geog.mcgill.ca  
 telephone: (514) 398-4943

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.).

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

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

- 170-200 (3) The Global Environment  
 170-201 (3) Society and Environment  
 170-202 (3) The Evolving Earth  
 170-203 (3) Knowledge, Ethics and Environment  
 170-400 (3) Environmental Thought  
 170-401 (3) Environmental Research

**Domain – Required Courses** (21 credits)

- 177-208 (3) Ecology  
 151-339 (3) Ecological Anthropology  
 154-313D (6) Economic Development  
 183-302 (3) Environmental Analysis and Management  
 183-410 (3) Geography of Underdevelopment: Current Problems  
 151-418 (3) Environment and Development

**Domain – Complementary Courses** (15 credits)

3 credits in statistics to be chosen from:

- 189-203 (3) Principles of Statistics I  
 166-350 (3) Statistics in Social Research  
 204-204 (3) Introduction to Psychological Statistics  
 (or equivalent)

12 credits to be chosen from the following:

- 101-292 (3) History and the Environment  
 101-473D (6) Environmental History Seminar  
 151-349 (3) Transformation of Developing Countries  
 151-358 (3) Process of Anthropological Research  
 151-439 (3) Theories of Development  
 151-445 (3) Property and Land Tenure  
 152-497 (3) Research Seminar on International Development  
 154-208 (3) Microeconomic Analysis and Applications  
 154-326 (3) Ecological Economics  
 154-405 (3) Resource Economics  
 154-412 (3) Topics of Economic Development I  
 154-416 (3) Topics of Economic Development II  
 160-338 (3) Developing Areas/Topics I  
 160-422 (3) Developing Areas/ Topics II  
 160-445 (3) IPE: North-South Relations  
 160-472 (3) Developing Areas/ Social Movements  
 160-522 (3) Developing Areas/Honours Seminar  
 166-328 (3) Environmental Sociology  
 166-354 (3) Dynamics of Industrial Societies  
 166-550 (3) The Sociology of Developing Societies  
 177-365 (3) Conservation Biology

177-453B	(3)	Neotropical Environments (in Panama)
177-460	(3)	Aquatic Conservation
177-535	(3)	Political Ecology
183-300	(3)	Human Ecology in Geography
183-305	(3)	Soils and Environment
183-322	(3)	Environmental Hydrology
183-331	(3)	Urban Social Geography
183-404	(3)	Environmental Management for Developing Areas
183-408	(3)	Geography of Unequal Development: Historical Roots
183-496	(3)	Regional Geographical Excursion
183-498B	(3)	Humans in Tropical Environments (in Panama)
183-500	(3)	Geography of Regional Identity
183-502	(3)	Geography of Northern Development
183-510	(3)	Humid Tropical Environments
183-551	(3)	Environmental Decisions
276-440	(3)	Strategies for Sustainable Development
276-567	(3)	Business in Society
330-210	(3)	Agro-Ecological History (M)
330-411	(3)	International Agriculture (M)
334-333	(3)	Resource Economics (M)
334-430	(3)	Agriculture, Food and Resource Policy (M)
334-442	(3)	Economics of International Development (M)
350-380	(3)	Food Systems and the Environment (M)
375-375	(3)	Issues in Environmental Sciences (M)
375-380	(3)	Law and Land Use Policy (M)
375-415	(2)	Conservation Law (M)
382-406	(3)	Ecology of Human Nutrition (M)
382-501	(3)	Nutrition in Developing Countries (M)
407-532	(3)	International Social Welfare
409-505	(3)	Geographic Information Systems

## 6 B.Sc. Major Program in Environment

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

- 1. Introductory Core:** The Core consists of four introductory courses 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. Additional Domains are being developed in several areas. More information on these is available on the MSE website (<http://www.mcgill.ca/mse>).
- 3. Final Core:** 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.Sc. Major in Environment, students must:

- register in a Domain using the MARS Program Codes listed below;
- 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
- fulfil all Faculty requirements as specified for the B.Sc. in the Faculty of Science **section 2** which includes meeting the minimum credit requirement as specified in their letter of admission.

**B.Sc. MAJOR PROGRAM IN ENVIRONMENT** (54 to 64 credits – depending upon Domain selected)

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

The Core courses are listed in the Domain descriptions.

**Domain** (36 to 46 credits – depending upon Domain selected)

one MSE Domain selected from those available to students in the B.Sc. Major.

Currently available:

Atmospheric Environment and Air Quality (39 credits)

Biodiversity and Conservation (42 credits)

Earth Sciences and Economics (45 or 46 credits)

Ecological Determinants of Health –  
Population Stream (39 - 40 credits)  
or Cellular Stream (39 - 41 credits)

Environmetrics (42 credits)

Food Production and the Environment (45 or 46 credits)  
(Awaiting Final Approval)

Renewable Resource Management (42 credits)

Water Environments and Ecosystems –

Physical Stream or Biological Stream (36 credits)

Additional Domains TBA

Each Domain has different requirements which are listed below.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling.

### 6.1 Atmospheric Environment and Air Quality Domain

(57 credits including Core) [MARS Program Codes: Downtown 1-412004; Macdonald 1-412054]

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Peter Yau

email: [yau@rainband.meteo.mcgill.ca](mailto:yau@rainband.meteo.mcgill.ca)

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 know-how necessary to measure and analyze atmospheric constituents.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

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

170-200 (3) The Global Environment

170-201 (3) Society and Environment

170-202 (3) The Evolving Earth

170-203 (3) Knowledge, Ethics and Environment

170-400 (3) Environmental Thought

170-401 (3) Environmental Research

**Domain – Required Courses** (18 credits)

180-307 (3) Environmental Analysis

195-214 (3) Intro. to the Physics of the Atmosphere

195-219 (3) Introduction to Atmospheric Chemistry  
or 180-219

195-308 (3) Principles of Remote Sensing  
or 183-308

195-315 (3) Water in the Atmosphere

195-402 (3) Atmosphere-Ocean Transports

**Domain – Complementary Courses** (21 credits)

6 or 7 credits from:

- 189-222 (3) Calculus III  
 or 360-202 (3) Calculus (M)  
 180-257D (4) Analytical Chemistry  
 or 333-213 (3) Analytical Chemistry I (M)

3 credits from:

- 189-203 (3) Principles of Statistics I  
 or 360-310 (3) Statistical Methods I (M)  
 or equivalent

9 credits (at least 6 credits of which are at the 300 level or above) chosen from the following:

- 180-273 (1) Chemical Kinetics  
 180-377 (3) Instrumental Analysis II  
 183-505 (3) Global Biogeochemistry  
 189-223 (3) Linear Algebra  
 189-315 (3) Ordinary Differential Equations  
 or 360-205 (3) Differential Equations (M)  
 195-215 (3) Weather Systems and Climate  
 195-419 (3) Adv. in Chem. of Atmosphere  
 or 180-419  
 195-515 (3) Turbulence in the Atmosphere and Oceans  
 195-540 (3) Synoptic Meteorology I  
 302-230 (3) Environmental Aspects of Technology  
 303-225 (3) Environmental Engineering  
 308-208 (3) Computers in Engineering  
 338-510 (3) Agricultural Micrometeorology (M)  
 375-333 (3) Physical and Biological Aspects of Pollution (M)

3 credits chosen from the following:

- 151-206 (3) Environment and Culture  
 151-418 (3) Environment and Development  
 154-225 (3) Economics of the Environment  
 154-347 (3) Economics of Climate Change  
 160-466 (3) Public Policy Analysis  
 183-302 (3) Environmental Analysis and Management  
 183-404 (3) Environmental Management for Developing Areas  
 260-270 (3) Religious Ethics and the Environment  
 389-580 (3) Environment and the Law

**6.2 Biodiversity and Conservation Domain**

(60 credits including Core) [MARS Program Codes: Downtown 1-412002; Macdonald 1-412052]

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Graham Bell  
 email: gbell2@maclean.mcgill.ca  
 telephone: (514) 398-4086

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.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *infoMcGill* for current schedul-

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

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

- 170-200 (3) The Global Environment  
 170-201 (3) Society and Environment  
 170-202 (3) The Evolving Earth  
 170-203 (3) Knowledge, Ethics and Environment  
 170-400 (3) Environmental Thought  
 170-401 (3) Environmental Research

**Domain – Required Courses** (18 credits)

9 credits, basic courses in the biological principles of diversity, systematics and conservation

- 177-304 (3) Evolution  
 177-305 (3) Diversity of Life  
 177-365 (3) Conservation Biology

9 credits, interface between science, policy and management

- 151-418 (3) Environment and Development  
 154-225 (3) Economics of the Environment  
 183-302 (3) Environmental Analysis and Management

**Domain – Complementary Courses** (24 credits)

6 credits of ecology and statistics:

- 177-208 (3) Ecology  
 or 344-205 (3) Principles of Ecology (M)  
 177-373 (3) Biostatistical Analysis  
 or 360-310 (3) Statistical Methods I (M)

3 credits chosen from:

- 177-358\* (3) Canadian Flora  
 367-358\* (3) Flowering Plant Diversity (M)  
 349-312 (3) Zoological Systematics and Evolution (M)

\* 367-358A and 177-358A are courses with substantially the same content, taught on different campuses. Only one may be taken. See the Calendar listing for these courses for information on the required field component in summer prior to first classes.

One of 367-358A/177-358A or 349-312A must be taken to satisfy Domain Core requirements, the other may be chosen as a complementary course from List III.

3 credits, one of the following field courses:

- 177-331 (3) Ecology and Behaviour Field Course  
 177-334 (3) Field Course in Applied Tropical Ecology  
 177-453 (3) Neotropical Environments  
 183-495 (3) Field Studies in Physical Geography  
 183-497 (3) Field Studies in Geography: Coastal Marsh Plant Ecology  
 183-499 (3) Subarctic Field Studies in Geography  
 375-475 (3) Desert Ecology (M)

12 credits chosen from the following three course lists, of which 6 must be 300-level or above, noting that there must be at least 6 credits 400-level or above in the Domain as a whole. The distribution of the 12 credits is to be:

6 credits from List I: courses dealing with general scientific principles.

- 177-324 (3) Ecological Genetics  
 177-341 (3) History of Life  
 177-432 (3) Limnology  
 177-441 (3) Biological Oceanography  
 177-442 (3) Marine Biology  
 177-460 (3) Aquatic Conservation  
 177-473 (3) Ecology of Aquatic Invertebrates  
 177-505 (3) Advanced Seminar in Biodiversity & Systematics  
 183-201 (3) Geographical Information Systems I  
 183-272 (3) Landforms and Environmental Systems  
 183-350 (3) Ecological Biogeography  
 336-330 (3) GIS for Biosystems Management (M)  
 349-313 (3) Zoogeography (M)  
 367-460 (3) Plant Ecology (M)  
 373-331 (3) Microbial Ecology (M)

- 373-421 (3) Topics in Wildlife Conservation (*M*)  
 374-410 (3) The Forest Ecosystem (*M*)  
 374-420 (3) Environmental Issues in Forestry (*M*)  
 375-375 (3) Issues in Environmental Sciences (*M*)  
 375-410 (3) Wildlife Ecology (*M*)  
 375-437 (3) Assessing Environmental Impact (*M*)  
 A second field course from the Domain curriculum may also be taken.

3 credits from List II: courses dealing with societal issues and principles:

- 151-339 (3) Ecological Anthropology  
 154-326 (3) Ecological Economics  
 166-328 (3) Environmental Sociology  
 183-321 (3) Climatic Environments  
 183-404 (3) Environmental Management for Developing Areas  
 183-510 (3) Humid Tropical Environments  
 334-333 (3) Resource Economics (*M*)  
 375-415 (2) Conservation Law (*M*) (If this course is taken, one additional credit of electives must be taken.)

3 credits from List III: courses dealing with particular groups of organisms:

- 177-327 (3) Herpetology  
 177-351 (3) The Biology of Invertebrates  
 177-354 (3) Biology of Birds  
 177-437 (3) Advanced Invertebrate Zoology  
 177-358 (3) Canadian Flora  
 or 367-358 (3) Flowering Plant Diversity (*M*)  
 349-307 (3) Natural History of the Vertebrates (*M*)  
 349-312 (3) Zoological Systematics and Evolution (*M*)  
 349-424 (3) Parasitology (*M*)  
 350-440 (3) Systematic Entomology (*M*)  
 367-304 (3) Biology of Fungi (*M*)  
 367-458 (3) Flowering Plant Systematics (*M*)  
 375-420 (3) Topics in Ornithology (*M*)

### 6.3 Earth Sciences and Economics Domain

(63 or 64 credits including Core) [MARS Program Codes: Downtown 1-412007; Macdonald 1-412057]

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Don Baker  
 email: don\_b@geosci.lan.mcgill.ca  
 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.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

### Core - Required Courses (18 credits)

- 170-200 (3) The Global Environment  
 170-201 (3) Society and Environment  
 170-202 (3) The Evolving Earth  
 170-203 (3) Knowledge, Ethics and Environment  
 170-400 (3) Environmental Thought  
 170-401 (3) Environmental Research

### Required Courses for Domain (25 credits)

- 154-230D (6) Microeconomic Theory  
 154-405 (3) Natural Resource Economics  
 186-210 (3) Introduction to Mineralogy  
 186-212 (4) Introduction to Petrology  
 186-220 (3) Principles of Geochemistry  
 186-243 (3) Environmental Geology  
 186-425 (3) Depositional Environments & Sequence Stratigraphy

### Complementary Courses (20 or 21 credits)

12 credits from List A

- 177-208 (3) Ecology  
 or 344-205 (3) Principles of Ecology (*M*)  
 302-430 (3) Technology Impact Assessment  
 or 375-437 (3) Assessing Environmental Impact (*M*)  
 154-326 (3) Ecological Economics  
 154-347 (3) Economics of Climate Change  
 154-416 (3) Topics in Economic Development II  
 154-525 (3) Project Analysis  
 334-333 (3) Resource Economics (*M*)

8 or 9 credits from List B

- 151-339 (3) Ecological Anthropology  
 154-305 (3) Industrial Organization  
 154-313D (6) Economic Development  
 154-408D (6) Public Sector Economics  
 154-412 (3) Topics in Economic Development I  
 166-328 (3) Environmental Sociology  
 177-305 (3) Diversity of Life  
 183-302 (3) Environmental Analysis and Management  
 183-322 (3) Environmental Hydrology  
 186-312 (3) Spectroscopy of Minerals  
 186-334 (3) Invertebrate Paleontology and Evolution  
 186-401 (3) Advanced Environmental Geology  
 186-402C (2) Environmental Field School  
 186-483D (6) Independent Study in Environmental Geology  
 186-519 (3) Isotope Geology  
 186-542 (3) Chemical Oceanography  
 186-549 (3) Hydrogeology  
 186-580 (3) Aqueous Geochemistry  
 186-590 (3) Applied Geochemistry Seminar  
 195-210 (3) Introduction to Atmospheric Science  
 195-220 (3) Introduction to Oceanic Sciences  
 330-435 (3) Soil and Water Quality Management (*M*)  
 372-410 (3) Soil Chemistry (*M*)

### 6.4 Ecological Determinants of Health Domain

(57 to 59 credits including Core) [MARS Program Codes: Downtown 1-412008; Macdonald 1-412058]

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Tim Johns  
 email: johns@macdonald.lan.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.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

### Ecological Determinants of Health Domain – Population Stream

#### Core - Required Courses (18 credits)

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(3)	Environmental Thought
170-401	(3)	Environmental Research

#### Required Courses for Domain - Population Stream (6 credits)

382-361	(3)	Environmental Toxicology (M)
391-410	(3)	Environment and Infection (M)

#### Complementary Courses for Domain (33 or 34 credits)

Students are required to take a maximum of 19 credits at the 200 level and a minimum of 6 credits at the 400 level or higher.

18 or 19 credits from the following List A:

166-234	(3)	Population and Society
or 166-222	(3)	Urban Sociology
333-211	(3)	Biochemistry I (M)
or 177-200	(3)	Molecular Biology
or 177-201	(3)	Cell Biology and Metabolism
356-204	(4)	Genetics (M)
or 177-202	(3)	Basic Genetics
382-207	(3)	Nutrition and Health (M)
or 382-307	(3)	Human Nutrition ( <i>Video Conference: Downtown and Macdonald</i> )
or 342-330	(3)	Fundamentals of Nutrition (M)
374-410	(3)	The Forest Ecosystem (M)
or 177-365	(3)	Conservation Biology
or 177-438	(3)	Statistics in Population Biology
or 360-306	(3)	Mathematical Methods in Ecology (M)
or 367-460	(3)	Plant Ecology (M)
or 373-331	(3)	Microbial Ecology (M)
or 375-410	(3)	Wildlife Ecology (M)
189-203	(3)	Principles of Statistics I
or 360-310	(3)	Statistical Methods I (M)
or equivalent		

6 credits from the following List B:

166-254	(3)	Development and Underdevelopment
or 101-292	(3)	History and the Environment
or 151-212	(3)	Anthropology of Development
or 330-210	(3)	Agro-Ecological History (M)
336-217	(3)	Hydrology and Drainage (M)
or 183-321	(3)	Climatic Environments
or 183-322	(3)	Environmental Hydrology
or 330-250	(3)	Principles of Ecological Agriculture (M)
or 338-510	(3)	Agricultural Micrometeorology (M)
334-242	(3)	Management Theories and Practices (M)
or 107-343	(3)	Biomedical Ethics
or 154-208	(3)	Microeconomic Analysis and Applications

or 177-535	(3)	Political Ecology
or 423-461	(3)	Society and Change

9 credits from the following list C:

166-328	(3)	Environmental Sociology
or 183-300	(3)	Human Ecology in Geography
or 183-498	(3)	Humans in Tropical Environments (in Panama)
or 204-533	(3)	International Health Psychology
or 407-374	(3)	Community Development / Social Action
528-324	(3)	Fundamental Virology
or 391-400	(3)	Eucaryotic Cells and Viruses (M)
or 391-438	(3)	Immunology (M)
or 513-637L	(3)	Infectious and Parasitic Disease Epidemiology
or 528-314	(3)	Immunology
or 528-413	(3)	Parasitology
382-406	(3)	Ecology of Human Nutrition (M)
or 330-411	(3)	International Agriculture (M)
or 382-420	(3)	Food Toxicants and Health Risks (M)
or 382-501	(3)	Nutrition in Developing Countries (M)
or 382-512	(3)	Herbs, Foods and Phytochemicals ( <i>Video Conference: Downtown and Macdonald</i> )
302-230	(3)	Environmental Aspects of Technology
or 183-201	(3)	Geographic Information Systems I
or 183-302	(3)	Environmental Analysis and Management
or 336-330	(3)	GIS for Biosystems Management (M)
or 375-437	(3)	Assessing Environmental Impact (M)
375-333	(3)	Physical and Biological Aspects of Pollution (M)
or 177-350	(3)	Insect Biology and Control
or 336-322	(3)	Agro-Food Waste Management (M)
or 350-452	(3)	Biocontrol of Insect Pests (M)
or 367-361	(3)	Pest Management and the Environment (M)

### Ecological Determinants of Health Domain – Cellular Stream

#### Core - Required Courses (18 credits)

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(3)	Environmental Thought
170-401	(3)	Environmental Research

#### Required Courses for Domain (6 credits)

382-361	(3)	Environmental Toxicology (M)
391-410	(3)	Environment and Infection (M)

#### Complementary Courses for Domain (33 to 35 credits)

Students are required to take a maximum of 19 credits at the 200 level and a minimum of 6 credits at the 400 level or higher.

18 or 19 credits chosen from List A:

166-234	(3)	Population and Society
or 166-222	(3)	Urban Sociology
333-211	(3)	Biochemistry I (M)
or 177-200	(3)	Molecular Biology
356-204	(4)	Genetics (M)
or 177-202	(3)	Basic Genetics
344-202	(3)	Cellular Biology (M)
or 177-201	(3)	Cell Biology and Metabolism
or 342-234	(3)	Biochemistry II (M)
382-307	(3)	Human Nutrition ( <i>Video Conference: Downtown and Macdonald</i> )
or 342-330	(3)	Fundamentals of Nutrition (M)
189-203	(3)	Principles of Statistics I
or 360-310	(3)	Statistical Methods I (M)
or equivalent		

6 or 7 credits chosen from List B:

552-209	(3)	Mammalian Physiology I
or 342-323	(4)	Mammalian Physiology (M)
549-300	(3)	Drug Action



- or 342-424 (3) Metabolic Endocrinology (*M*)
  - 362-341 (3) Mechanisms of Pathogenicity (*M*)
  - or 391-438 (3) Immunology (*M*)
  - or 528-314 (3) Immunology
- 9 credits chosen from List C:
- 336-217 (3) Hydrology and Drainage (*M*)
  - or 183-321 (3) Climatic Environments
  - or 183-322 (3) Environmental Hydrology
  - or 338-510 (3) Agricultural Micrometeorology (*M*)
  - 374-410 (3) The Forest Ecosystem (*M*)
  - or 177-365 (3) Conservation Biology
  - or 177-432 (3) Limnology
  - or 367-304 (3) Biology of Fungi (*M*)
  - or 367-460 (3) Plant Ecology (*M*)
  - or 373-331 (3) Microbial Ecology (*M*)
  - or 375-410 (3) Wildlife Ecology (*M*)
  - 546-300 (3) Human Disease
  - or 177-350 (3) Insect Biology and Control
  - or 350-452 (3) Biocontrol of Insect Pests (*M*)
  - or 367-361 (3) Pest Management and the Environment (*M*)
  - or 382-406 (3) Ecology of Human Nutrition (*M*)
  - or 382-420 (3) Food Toxicants and Health Risks (*M*)
  - or 382-512 (3) Herbs, Foods and Phytochemicals (*Video Conference: Downtown and Macdonald*)
  - or 391-400 (3) Eucaryotic Cells and Viruses (*M*)
  - or 528-324 (3) Fundamental Virology
  - or 528-413 (3) Parasitology
  - 302-230 (3) Environmental Aspects of Technology
  - or 183-302 (3) Environmental Analysis and Management
  - or 336-322 (3) Agro-Food Waste Management (*M*)
  - or 375-437 (3) Assessing Environmental Impact (*M*)
  - 375-333 (3) Physical and Biological Aspects of Pollution (*M*)
  - or 180-307 (3) Environmental Analysis
  - or 336-518 (3) Pollution Control for Agriculture (*M*)

## 6.5 Environmetrics Domain

(60 credits including Core) [MARS Program Codes: Downtown 1-412005; Macdonald 1-412055]

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Dutilleul  
email: cydp@musica.mcgill.ca  
telephone: (514) 398-7870

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 required courses for the Environmetrics Domain is composed primarily of six statistics courses and one mathematically-oriented course with biological and ecological applications. The list is completed by three 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 three 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 two complementary courses along each of two axes: statistics and mathematics and environmental sciences. The possibility of an internship is also offered to students to provide them with preliminary professional experience.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with**

**an (*M*). (Introductory Core Courses are offered on both campuses.)**

### Core – Required Courses (18 credits)

- 170-200 (3) The Global Environment
- 170-201 (3) Society and Environment
- 170-202 (3) The Evolving Earth
- 170-203 (3) Knowledge, Ethics and Environment
- 170-400 (3) Environmental Thought
- 170-401 (3) Environmental Research

### Domain – Required Course (3 credits)

- 360-414 (3) Temporal and Spatial Statistics (*M*)

### Domain – Complementary Courses (39 credits)

18 credits:

- 177-208 (3) Ecology
- or 344-205 (3) Principles of Ecology (*M*)
- 306-308 (3) Social and Economic Impacts of Technology
- or 375-437 (3) Assessing Environmental Impact (*M*)
- 177-309 (3) Mathematical Models in Biology
- or 360-306 (3) Mathematical Methods in Ecology (*M*)
- 183-201 (3) Geographic Information Systems I
- or 336-330 (3) GIS for Biosystems Management (*M*)
- 183-351 (3) Quantitative Methods in Geography
- or 177-438 (3) Statistics in Population Biology
- 303-555 (3) Environmental Data Analysis
- or 360-411 (3) Experimental Design (*M*)

3 credits chosen from:

- 183-305 (3) Soils and Environment
- 372-210 (3) Principles of Soil Science (*M*)
- 186-243 (3) Environmental Geology
- 303-323 (3) Hydrology and Water Resources
- 183-322 (3) Environmental Hydrology
- 336-217 (3) Hydrology and Drainage (*M*)

6 credits of statistics, one of the following three options:

Option 1:

- 189-203 (3) Principles of Statistics I
- and 189-204 (3) Principles of Statistics II

or Option 2:

- 189-323 (3) Probability Theory
- and 189-324 (3) Statistics

or Option 3:

- 177-373 (3) Biostatistical Analysis
- or 360-310 (3) Statistical Methods (*M*)

and one 3-credit applied statistics course from the statistics and mathematics list given below

6 credits of statistics and mathematics chosen from:

- 166-461 (3) Quantitative Data Analysis
- 166-504 (3) Quantitative Methods I
- 166-505 (3) Quantitative Methods II
- 166-580 (3) The Design and Practice of Social Research
- 189-223 (3) Linear Algebra
- 189-423 (3) Regression and Analysis of Variance
- 189-425 (3) Sampling Theory and Applications
- 189-447 (3) Stochastic Processes
- 336-252 (3) Structured Computer Programming (or equivalent) (*M*)
- 336-319 (3) Applied Mathematics (or equivalent) (*M*)
- 360-403 (3) Environmetrics Stage (internship) (*M*)

6 credits in environmental sciences chosen from:

- 177-331 (3) Ecology/Behavior Field Course
- 177-526 (3) Plants and Extreme Environments
- 183-300 (3) Human Ecology in Geography
- 183-302 (3) Environmental Analysis and Management
- 183-494 (3) Field Studies in Geography: Urban
- 183-499 (3) Subarctic Field Studies in Geography: Schefferville
- 306-451 (3) Environmental Controls
- 349-313 (3) Zoogeography (*M*)
- 367-460 (3) Plant Ecology (*M*)

- 374-300 (3) Urban Forests and Trees (*M*)  
 374-420 (3) Environmental Issues in Forestry (*M*)  
 375-333 (3) Physical and Biological Aspects of Pollution (*M*)  
 375-401 (4) Fisheries and Wildlife Management (*M*)

## 6.6 Food Production and Environment Domain

(63 or 64 credits including Core) [MARS Program Code TBA]  
 (Awaiting Final approval)

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: TBA (see MSE website)

The business of food production is an area of human activity with a large and intimate interaction with the environment. Modern agriculturalists 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.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

### Core - Required Courses (18 credits)

- 170-200 (3) The Global Environment  
 170-201 (3) Society and Environment  
 170-202 (3) The Evolving Earth  
 170-203 (3) Knowledge, Ethics and Environment  
 170-400 (3) Environmental Thought  
 170-401 (3) Environmental Research

### Prerequisite or Corequisite Courses for Domain (6 credits)

- 333-211 (3) Biochemistry I (*M*)  
 or 177-112 (3) Cell and Molecular Biology  
 or CEGEP Equivalent (Biology 401)  
 333-230 (4) Organic Chemistry (*M*)  
 or 180-212 (4) Introductory Organic Chemistry I  
 or CEGEP Chemistry 202

### Required Courses for Domain (12 credits)

- 330-210 (3) Agro-ecological History (*M*)  
 367-211 (3) Principles of Plant Science (*M*)  
 367-300 (3) Cropping Systems (*M*)  
 375-375 (3) Issues in Environmental Science (*M*)

### Complementary Courses (33 or 34 credits)

15 or 16 credits of Basic Sciences

- 330-250 (3) Principles of Ecological Agriculture (*M*)  
 or 342-250 (3) Principles of Animal Science (*M*)  
 344-205 (3) Principles of Ecology (*M*)  
 or 177-208 (3) Ecology  
 356-204 (4) Genetics (*M*)  
 or 177-202 (3) Basic Genetics  
 360-310 (3) Statistical Methods I (*M*)  
 or equivalent  
 372-210 (3) Principles of Soil Science (*M*)  
 or 183-305 (3) Soils and Environment

12 credits of Applied Sciences

- 177-365 (3) Conservation Biology  
 177-453 (3) Neotropical Environments (in Panama)  
 183-302 (3) Environmental Analysis and Management  
 183-322 (3) Environmental Hydrology  
 or 336-217 (3) Hydrology and Drainage (*M*)

- 330-411 (3) International Agriculture (*M*)  
 330-430 (3) Ecological Agricultural Systems (*M*)  
 330-435 (3) Soil and Water Quality Management (*M*)  
 333-200 (3) Introduction to Food Science (*M*)  
 or 382-207 (3) Nutrition and Health (*M*)  
 333-535 (3) Food Biotechnology (*M*)  
 336-322 (3) Agro-Food Waste Management (*M*)  
 336-450 (3) Conserving the Neotropics (in Panama)  
 336-518 (3) Pollution Control for Agriculture (*M*)  
 342-501 (3) Advanced Animal Production Systems (*M*)  
 367-361 (3) Pest Management and the Environment (*M*)  
 367-434 (3) Weed Biology and Control (*M*)  
 372-315 (3) Soil Fertility and Fertilizers (*M*)  
 372-410 (3) Soil Chemistry (*M*)  
 373-331 (3) Microbial Ecology (*M*)  
 373-521 (3) Soil Microbiology and Biochemistry (*M*)  
 375-401 (3) Fisheries and Wildlife Management (*M*)  
 375-333 (3) Physical and Biological Aspects of Pollution (*M*)  
 375-437 (3) Assessing Environmental Impact (*M*)  
 382-361 (3) Environmental Toxicology (*M*)  
 382-406 (3) Ecology of Human Nutrition (*M*)  
 391-410 (3) Environment and Infection (*M*)

6 credits in Social Sciences / Humanities

- 151-418 (3) Environment and Development  
 154-225 (3) Economics of the Environment  
 166-254 (3) Development and Underdevelopment  
 183-404 (3) Environmental Management of Developing Areas  
 183-410 (3) Geography of Underdevelopment: Current Problems  
 183-498 (3) Humans in Tropical Environments (in Panama)  
 183-510 (3) Humid Tropical Environments  
 334-200 (3) Principles of Microeconomics (*M*)  
 334-320 (3) Economics of Agricultural Production (*M*)  
 334-333 (3) Resource Economics (*M*)  
 or 154-405 (3) Natural Resource Economics  
 334-430 (3) Agriculture, Food and Resource Policy (*M*)  
 334-442 (3) Economics of International Agricultural Development (*M*)  
 375-415 (2) Conservation Law (*M*)

## 6.7 Renewable Resource Management Domain

(60 credits including Core) [MARS Program Codes:  
 Downtown 1-412006; Macdonald 1-412056]

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Benoît Côté,  
 email: coteb@nrs.mcgill.ca  
 telephone: (514) 398-7952

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 mon-

itor and analyze the dynamics of natural and managed ecosystems.

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

#### Core - Required Courses (18 credits)

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(3)	Environmental Thought
170-401	(3)	Environmental Research

#### Prerequisite or Corequisite Courses for Domain (6 credits)

177-112	(3)	Cell and Molecular Biology or CEGEP Biology 401 or equivalent
180-212	(4)	Introductory Organic Chemistry I or CEGEP Chemistry 202 or equivalent

#### Domain – Complementary Courses (42 credits)

9 credits of basic principles of ecosystem processes and diversity chosen from:

344-200	(3)	Biology of Organisms I (M) or 367-201 (3) Comparative Plant Biology (M) or 177-305 (3) Diversity of Life
344-205	(3)	Principles of Ecology (M) or 177-208 (3) Ecology
372-210	(3)	Principles of Soil Science (M) or 183-305 (3) Soils and Environment

6 credits of statistics or GIS methods:

360-310	(3)	Statistical Methods 1 (M) or 177-373 (3) Biostatistical Analysis
336-330	(3)	GIS for Biosystems Management (M) or 183-201 (3) Geographical Information Systems I

6 credits of advanced ecosystem components chosen from:

367-358*	(3)	Flowering Plant Diversity (M) or 177-358* (3) Canadian Flora
* 367-358A and 177-358A are courses with substantially the same content, taught on different campuses. Only one may be taken. See the Calendar listing for these courses for information on the required field component in summer prior to first classes.		
349-307	(3)	Natural History of the Vertebrates (M)
372-326	(3)	Soil Genesis and Classification (M)

6 credits of advanced courses on ecological processes:

177-365	(3)	Conservation Biology
183-322	(3)	Environmental Hydrology or 336-217 (3) Hydrology and Drainage (M)
349-315	(3)	Science of Inland Waters (M) or 177-432 (3) Limnology
367-460	(3)	Plant Ecology (M)
373-331	(3)	Microbial Ecology (M)
374-410	(3)	The Forest Ecosystem (M)
375-410	(3)	Wildlife Ecology (M)
183-470C	(3)	Wetlands
183-372	(3)	Running Water Environments

6 credits of social processes:

151-339	(3)	Ecological Anthropology
166-328	(3)	Environmental Sociology
260-270	(3)	Religious Ethics and the Environment
334-242	(3)	Management Theories and Practices (M)
334-333	(3)	Resource Economics (M) or 154-405 (3) Natural Resource Economics
375-415	(2)	Conservation law (M)

9 credits in the management of ecosystems or ecosystem components:

177-470	(3)	Lake Management
183-302	(3)	Environmental Analysis and Management

183-404	(3)	Environmental Management for Developing Areas
330-435	(3)	Soil and Water Quality Management (M)
367-300	(3)	Cropping Systems (M)
374-441	(3)	Integrated Forest Management (M)
375-401	(4)	Fisheries and Wildlife Management (M)
375-437	(3)	Assessing Environmental Impact (M)

#### 6.8 Water Environments and Ecosystems Domain

(54 credits including Core) [MARS Program Codes: Downtown 1-412003; Macdonald 1-412053]

This Domain is open only to students in the B.Sc. Major in Environment program.

To educate students in both the ecological and physical facets of the water environment, this Domain offers two streams, with students choosing one or the other facet.

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 – Physical Stream

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Peter Yau  
email: yau@rainband.meteo.mcgill.ca  
telephone: (514) 398-3719

Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling. **Courses offered at Macdonald Campus are marked with an (M). (Introductory Core Courses are offered on both campuses.)**

#### Core – Required Courses (18 credits)

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(3)	Environmental Thought
170-401	(3)	Environmental Research

#### Recommended Corequisite Course for Domain (3 credits)

189-222	(3)	Calculus III or CEGEP Mathematics 201-303 or equivalent
---------	-----	--

#### Domain – Required Courses (9 credits)

183-372	(3)	Running Water Environments
195-220	(3)	Introduction to Oceanic Sciences
195-315	(3)	Water in the Atmosphere

#### Domain – Complementary Courses (27 credits)

183-322	(3)	Environmental Hydrology or 336-217 (3) Hydrology and Drainage (M)
177-208	(3)	Ecology or 344-205 (3) Principles of Ecology (M)

3 credits chosen from the following:

189-203	(3)	Principles of Statistics I
360-310	(3)	Statistical Methods I (or equivalent) (M)
189-222	(3)	Calculus III
360-202	(3)	Calculus (M)

12 credits chosen from the following:

183-201	(3)	Geographic Information Systems I
183-306	(3)	Geographical Information Systems II

- or 336-330 (3) GIS for Biosystems Management (*M*)
  - 183-522 (3) Advanced Environmental Hydrology
  - or 336-506 (3) Advances in Drainage Management (*M*)
  - or 336-509 (3) Hydrologic Systems and Modelling (*M*)
  - 183-537 (3) Advanced Fluvial Geomorphology
  - 186-549 (3) Hydrogeology
  - 189-315 (3) Ordinary Differential Equations
  - or 360-205 (3) Differential Equations (*M*)
  - 195-215 (3) Weather Systems and Climate
  - 195-318 (3) Principles of Remote Sensing
  - or 183-308
  - 195-402 (3) Atmosphere-Ocean Transports
  - 195-414 (3) Applications of Remote Sensing
  - 195-568 (3) Ocean Physics
  - 303-323 (3) Hydrology and Water Resources
  - 330-435 (3) Soil and Water Quality Management (*M*)
  - 336-416 (3) Engineering for Land Development (*M*)
  - 338-510 (3) Agricultural Micrometeorology (*M*)
  - 372-210 (3) Principles of Soil Science (*M*)
  - or 183-305 (3) Soils and Environment
- 6 credits chosen from the following:
- 177-441 (3) Biological Oceanography
  - or 177-432 (3) Limnology
  - or 349-315 (3) Science of Inland Waters (*M*)
  - 177-442 (3) Marine Biology
  - 177-460 (3) Aquatic Conservation
  - 177-473 (3) Ecology of Aquatic Invertebrates
  - 183-350 (3) Ecological Biogeography
  - 183-505 (3) Global Biogeochemistry
  - 375-401 (3) Fisheries and Wildlife Management (*M*)

#### **Water Environments and Ecosystems Domain – Biological Stream**

This Domain is open only to students in the B.Sc. Major in Environment program.

Advisor: Professor Joseph Rasmussen  
email: jrasmu@bio1.lan.mcgill.ca  
telephone: (514) 398-6467

#### **Core – Required Courses (18 credits)**

- 170-200 (3) The Global Environment
- 170-201 (3) Society and Environment
- 170-202 (3) The Evolving Earth
- 170-203 (3) Knowledge, Ethics and Environment
- 170-400 (3) Environmental Thought
- 170-401 (3) Environmental Research

#### **Domain – Required Course (3 credits)**

- 195-220 (3) Introduction to Oceanic Sciences

#### **Domain – Complementary Courses (33 credits)**

- 183-322 (3) Environmental Hydrology
- or 336-217 (3) Hydrology and Drainage (*M*)
- 177-208 (3) Ecology
- or 344-205 (3) Principles of Ecology (*M*)

3 credits chosen from the following:

- 189-203 (3) Principles of Statistics I
- 360-310 (3) Statistical Methods I (or equivalent) (*M*)
- 189-222 (3) Calculus III
- 360-202 (3) Calculus (*M*)

3 credits chosen from the following:

- 177-441 (3) Biological Oceanography
- 177-432 (3) Limnology
- 349-315 (3) Science of Inland Waters (*M*)

3 credits chosen from the following:

- 177-331 (3) Ecology and Behaviour Field Course
- or 183-497 (3) Field Studies in Geography: Coastal Marsh Plant Ecology
- or one of the Huntsman Marine Science Centre field courses

9 credits chosen from the following:

- 177-441 (3) Biological Oceanography
  - or 177-432 (3) Limnology
  - 177-442 (3) Marine Biology
  - 177-460 (3) Aquatic Conservation
  - 177-473 (3) Ecology of Aquatic Invertebrates
  - 183-305 (3) Soils and Environment
  - or 372-210 (3) Principles of Soil Science (*M*)
  - 183-350 (3) Ecological Biogeography
  - 330-435 (3) Soil and Water Quality Management (*M*)
  - 350-535 (3) Aquatic Entomology (*M*)
  - 373-331 (3) Microbial Ecology (*M*)
  - 375-333 (3) Physical and Biological Aspects of Pollution (*M*)
  - 375-401 (3) Fisheries and Wildlife Management (*M*)
- 6 credits chosen from the following:
- 180-257 (4) Analytical Chemistry
  - 183-201 (3) Geographic Information Systems I
  - 183-372 (3) Running Water Environments
  - 183-522 (3) Advanced Hydrology
  - 183-537 (3) Advanced Fluvial Geomorphology
  - 183-550 (3) Quaternary Paleoecology
  - 186-220 (3) Principles of Geochemistry
  - 195-215 (3) Weather Systems and Climate
  - 195-308 (3) Principles of Remote Sensing
  - or 183-308
  - 195-310 (3) Physical Oceanography
  - 195-330 (3) Physical Meteorology
  - 336-330 (3) GIS for Biosystems Management (*M*)

3 credits chosen from the following list:

- 151-339 (3) Ecological Anthropology
- 151-418 (3) Environment and Development
- 154-225 (3) Economics and the Environment
- 154-326 (3) Ecological Economics
- 160-345 (3) International Organization
- 160-466 (3) Public Policy Analysis
- 334-333 (3) Natural Resource Economics (*M*)

## **7 Panama Field Study Semester**

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

**Prerequisites:** Spanish Language Elementary 144-218A, or equivalent proficiency, and Principles of Statistics I 189-203, or equivalent. A GPA of 3.00 and higher is recommended. The program is aimed at 400-level students in their final year.

#### **Offered in the Winter Term**

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

The lecture courses will each consist of contact-hours organized over a four-week period, as follows:

- two weeks of lectures, 6 hours per day,
- one week of seminars; 3 hours per day, and
- one week in the field or laboratory, 8 hours per day.

#### **Panama Field Study Semester – Required Courses (15 credits)**

9 credits of formal training

- 177-453B (3) Neotropical Environments
- 183-498B (3) Humans in Tropical Environments
- 336-450B (3) Conserving the Neotropics

6 credits of research:

- 170-451B (6) Research in Panama

Hands-on experience is gained through an Independent Studies 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).

The independent study will have two requirements: attendance at STRI seminar series and at a weekly group discussion. The STRI's seminar series will expose the students to state of the art tropical ecology and involve them in current issues. The weekly discussions will enable student and professors to share experiences and will provide continuity during the term.

Enrolment of McGill students is limited to 26 students. In addition to the regular McGill fees, the cost is approximately \$5500CDN (excluding food, tuition and insurance).

For the year 2001, students are to submit, by April 1, 2000, a letter of intent, CV, and copy of their transcript to Susan Gabe, Biology Undergraduate Office (W4/8, Stewart Biology Building, Downtown Campus, telephone (514)398-7045.

See the MSE website for more information.

## 8 Diploma In Environment

Advisor: Mr. Pete Barry, MSE Program Coordinator  
email: info@mse.mcgill.ca  
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 either the Faculty of Science or the Faculty of Arts, 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 (18 credits)

170-200	(3)	The Global Environment
170-201	(3)	Society and Environment
170-202	(3)	The Evolving Earth
170-203	(3)	Knowledge, Ethics and Environment
170-400	(3)	Environmental Thought
170-401	(3)	Environmental Research

#### Complementary Courses (12 credits)

12 credits selected from the Thematic Categories:

6 credits must be taken within the thematic area outside the area of the student's previous degree (e.g. those with a B.A. degree must take 6 credits from the Natural Sciences and Technology list; those with a B.Sc. 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. degree must take 6 credits at the 400 level or higher in Social Sciences and Policy; those with a B.Sc. degree must take 6 credits at the 400 level or higher in Natural Sciences and Technology.)

## 9 Human Impacts on the Environment Summer Program at Macdonald Campus

(Awaiting University Approval)

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

and apply research techniques and analytical skills within a multi-disciplinary, holistic approach.

See the 2000 Summer Studies Calendar (pages 16 and 42) or the MSE website for details.

## 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. Check the departmental listings in this Calendar for full course descriptions and prerequisites, and *info*McGill for current scheduling.

### SOCIAL SCIENCES AND POLICY

#### Anthropology

151-206	(3)	Environment and Culture
151-212	(3)	Anthropology of Development
151-339	(3)	Ecological Anthropology

#### Economics

154-205	(3)	An Introduction to Political Economy
154-225	(3)	Economics of the Environment
154-326	(3)	Ecological Economics
154-347	(3)	Economics of Climate Change
154-405	(3)	Natural Resource Economics

#### Environment

170-201	(3)	Society and Environment
170-203	(3)	Knowledge, Ethics and Environment
170-400	(3)	Environmental Thought

#### Geography

183-200	(3)	Geographical Perspectives on World Environmental Problems
183-216	(3)	Geography of the World Economy
183-301	(3)	Geography of Nunavut
183-300	(3)	Human Ecology in Geography
183-302	(3)	Environmental Analysis and Management
183-410	(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.

389-508	(2)	Research Seminars (Several are available, check the Law calendar for details.)
389-580	(3)	Environment and the Law

#### Philosophy

107-230	(3)	Introduction to Moral Philosophy I
107-237	(3)	Contemporary Moral Issues
107-334	(3)	Ethics I

#### Political Science

160-211	(3)	Introduction to Comparative Politics
160-212	(3)	Government and Politics of the Developed World
160-227	(3)	Developing Areas/Introduction
160-345	(3)	International Organization
160-445	(3)	IPE: North-South Relations

#### Psychology

204-215	(3)	Social Psychology
---------	-----	-------------------

**Religious Studies**

- 260-270 (3) Religious Ethics and the Environment  
 260-370 (3) The Human Condition  
 260-376 (3) Religious Ethics

**Sociology**

- 166-234 (3) Population and Society  
 166-235 (3) Technology and Society  
 166-254 (3) Development and Underdevelopment  
 166-328 (3) Environmental Sociology  
 166-366 (3) Social Change in the Caribbean

**Agricultural Economics (Macdonald Campus)**

- 334-231 (3) Economic Systems of Agriculture  
 334-333 (3) Resource Economics  
 334-430 (3) Agriculture, Food and Resource Policy

**Religious Studies (Macdonald Campus)**

- 260-270A (3) Religious Ethics and the Environment

**Renewable Resources (Macdonald Campus)**

- 375-415 (2) Conservation Law

**NATURAL SCIENCES AND TECHNOLOGY****Architecture**

- 301-375 (2) Landscape  
 301-377 (2) Energy, Environment and Buildings  
 301-378 (3) Site Usage

**Atmospheric and Oceanic Sciences**

- 195-210 (3) Introduction to Atmospheric Science  
 195-215 (3) Weather Systems and Climate  
 195-220 (3) Introduction to Oceanic Sciences

**Biology**

- 177-208 (3) Ecology  
 177-305 (3) Diversity of Life  
 177-365 (3) Conservation Biology  
 177-432 (3) Limnology  
 177-473 (3) Ecology of Aquatic Invertebrates

**Chemistry**

- 180-201 (3) Modern Inorganic Chemistry I  
 180-212 (4) Introductory Organic Chemistry I  
 180-301 (3) Modern Inorganic Chemistry II  
 180-307 (3) Environmental Analysis  
 180-350 (3) Earth, Fire, Air and Water

**Chemical Engineering**

- 302-230 (3) Environmental Aspects of Technology  
 302-471 (3) Industrial Water Pollution Control  
 302-472 (3) Industrial Air Pollution Control

**Civil Engineering**

- 303-225 (4) Environmental Engineering  
 303-323 (3) Hydrology and Water Resources  
 303-526 (3) Solid Waste Management  
 303-550 (3) Water Resources Management  
 303-553 (3) Stream Pollution and Control  
 303-555 (3) Environmental Data Analysis

**Computer Science**

- 308-102 (3) Computers and Computing (Arts Students only)  
 308-202 (3) Introduction to Computing I  
 308-203 (3) Introduction to Computing II

**Earth and Planetary Sciences**

- 186-233 (3) Earth and Life History  
 186-243 (3) Environmental Geology  
 186-425 (3) Depositional Environments & Sequence Stratigraphy

**Environment**

- 170-200 (3) The Global Environment  
 170-202 (3) The Evolving Earth

**Geography**

- 183-201 (3) Geographic Information Systems I  
 183-205 (3) Global Change: Past, Present and Future

- 183-272 (3) Landforms and Environmental Systems  
 183-308 (3) Remote Sensing  
 183-322 (3) Environmental Hydrology

**Mechanical Engineering**

- 305-343 (3) Energy Conversion  
 305-534 (3) Air Pollution Engineering

**Microbiology and Immunology**

- 528-211 (3) Biology of Microorganisms  
 528-314 (3) Immunology  
 528-323 (3) Microbial Physiology and Genetics  
 528-324 (3) Fundamental Virology

**Mining and Metallurgical Engineering**

- 306-308 (3) Social and Economic Impacts of Technology  
 306-320 (3) Extraction of Energy Resources  
 306-451 (3) Environmental Controls  
 306-555 (3) Thermal Remediation of Wastes

**Physics**

- 198-248 (3) Physics of Energy

**Psychology**

- 204-431 (3) Environment and the Developing Brain

**Agriculture and Biosystems Engineering****(Macdonald Campus)**

- 330-435 (3) Soil and Water Quality Management  
 336-217 (3) Hydrology and Drainage  
 336-322 (3) Agro-Food Waste Management  
 336-518 (3) Pollution Control for Agriculture

**Biology (Macdonald Campus)**

- 344-205 (3) Principles of Ecology  
 344-495 (3) Environmental Biology Seminar

**Microbiology (Macdonald Campus)**

- 373-331 (3) Microbial Ecology

**Physics (Macdonald Campus)**

- 338-201 (3) Introductory Meteorology

**Plant Science (Macdonald Campus)**

- 367-304 (3) Biology of Fungi  
 367-305 (3) Plant Pathology  
 367-358 (3) Flowering Plant Diversity  
 367-460 (3) Plant Ecology

**Renewable Resources (Macdonald Campus)**

- 375-333 (3) Physical and Biological Aspects of Pollution  
 375-375 (3) Issues in Environmental Sciences  
 375-410 (3) Wildlife Ecology  
 375-437 (3) Assessing Environmental Impact

**Soil Science (Macdonald Campus)**

- 372-200 (3) Introduction to Earth Science

**Zoology (Macdonald Campus)**

- 349-315 (3) Science of Inland Waters

**11 Courses**

MSE courses are team-taught by faculty spanning a range of disciplines and perspectives.

□ Denotes limited enrolment.

The course credit weight is given in parentheses (#) after the course title.

**170-200A THE GLOBAL ENVIRONMENT.** (3) A systems approach to study the different components of the environment involved in global climate change: the atmosphere, biosphere, hydrosphere, and lithosphere. The interactions among these components. Their role in global climate change. The human dimension to global change.  
*Section 01: Downtown Campus*  
*Section 51: Macdonald campus*

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

*Section 01: Downtown Campus*

*Section 51: Macdonald campus*

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

*Section 01: Downtown Campus*

*Section 51: Macdonald campus*

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

*Section 01: Downtown Campus*

*Section 51: Macdonald campus*

**170-400A ENVIRONMENTAL THOUGHT.** (3) Students work in interdisciplinary seminar groups on challenging philosophical, ethical, scientific and practical issues. They will explore cutting-edge ideas and grapple with the reconciliation of environmental imperatives and social, political and economic pragmatics. Activities include meeting practitioners, attending guest lectures, following directed readings, and organizing, leading and participating in seminars.

*Downtown Campus only.*

□ **170-401A ENVIRONMENTAL RESEARCH.** (3)(Restricted to students in the B.A., B.Sc. and Diploma in Environment programs. Corequisite: 170-400) Students work in an interdisciplinary team on a real-world research project involving problem definition, methodology development, social, ethical and environmental impact assessment, execution of the study, and dissemination of results to the research community and to the people affected. Teams begin defining their projects during the preceding year.

*Downtown Campus only.*

□ **170-451B RESEARCH IN PANAMA** (6) (Restricted to students in the Panama Field Semester program.) Research projects will be developed by instructors in consultation with Panamanian Universities, Government Agencies and non-Governmental Organizations. Project groups will consist of four to six students working with a Panamanian Institution. Topics will be relevant to Panama: e.g. protection of the Canal watershed, economical alternatives to deforestation, etc. See [“Panama Field Study Semester” on page 476.](#)

*Offered in Panama only.*