

## 14 McGill School of Environment

### Table of Contents

- 14.1 The School, page 391
  - 14.1.1 Location
  - 14.1.2 Administrative Officers
  - 14.1.3 Academic Staff
  - 14.1.4 Creation of the School
  - 14.1.5 Goals of the School
- 14.2 Admission, Registration and Regulations, page 392
  - 14.2.1 Admission
  - 14.2.2 Degree Requirements
  - 14.2.3 Important Information about Program Selection
  - 14.2.4 Course Numbering System at McGill
  - 14.2.5 Examination Regulations
  - 14.2.6 Courses outside the Student's Faculty
- 14.3 Programs Offered, page 393
- 14.4 Minor in Environment, page 393
  - 14.4.1 Minor Concentration in Environment
  - 14.4.2 Minor in Environment
- 14.5 B.A. Faculty Program in Environment, page 394
  - 14.5.1 Ecological Determinants of Health in Society Domain

14.5.2 Food, Food Webs and the Earth's Environment 394  
 14.5.3 Environmental Science 394  
 14.5.4 Environmental Policy 394  
 14.5.5 Environmental Law 394  
 14.5.6 Environmental Ethics 394  
 14.5.7 Environmental Economics 394  
 14.5.8 Environmental Health 394  
 14.5.9 Environmental Quality 394  
 14.5.10 Environmental Justice 394  
 14.5.11 Environmental Science 394  
 14.5.12 Environmental Policy 394  
 14.5.13 Environmental Law 394  
 14.5.14 Environmental Ethics 394  
 14.5.15 Environmental Economics 394  
 14.5.16 Environmental Health 394  
 14.5.17 Environmental Quality 394  
 14.5.18 Environmental Justice 394

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#### 14.1.4 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. The growth of technology, globalizing economies, and rapid increase in population have had dramatic and significant environmental impacts.

regulations of their faculty of admission. These regulations are **not identical** :

- Arts students, see Faculty of Arts, [see section 3.6.2 "Courses outside the Faculties of Arts and of Science"](#).
- Science students, see Faculty of Science, [see section 3.6.3 "Courses outside the Faculties of Arts and Science"](#).
- Agricultural and Environmental Sciences students, [see section 13.5.1 "Minimum Credit Requirement"](#).
- 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/artscisao](http://www.mcgill.ca/artscisao). Check under Departmental Students; Course and Program Selection; Science Students; Policy for Courses Outside Arts and Science.
- Students in the Diploma of Environment follow the program as specified; [see section 14.8 "Diploma in Environment"](#).

### 14.3 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.

New programs, including Honours and a Faculty program for the B.A. Sc. degree, are being proposed for September 2005. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.

## 14.5 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:

- register in a Domain on-line, using Minerva;
- satisfy the co- / prerequisites for the program (calculus and a basic science course);
- 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
- fulfill all Faculty requirements as specified for the B.A. in the Arts, **see section 3 "Faculty Degree Requirements"**, 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 corequisite for the first year of the program:

3 credits of calculus:

MATH139 Calculus  
or MATH140 Calculus 1  
or equivalent (e.g., CEGEP objective 00UN)

3 credits of basic science chosen from:

BIOL111 Principles: Organismal Biology (required for the Ecological Determinants of Health in Society Domain)  
or CHEM110 General Chemistry 1  
or PHYS101 Introductory Physics - Mechanics  
or their equivalents (e.g., CEGEP 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 (3credits)

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](http://www.mcgill.ca/minerva).

New programs are under consideration for the 2005-06 academic year. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.

### 14.5.1 Ecological Determinants of Health in Society Domain

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.]

This Domain (54credits including Core) is open only to students in the B.A. Faculty Program in Environment.

Adviser: Professor Tim Johns  
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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](http://www.mcgill.ca/minerva).

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

### Prerequisite or Corequisite Courses for Program

MATH139 (4) Calculus  
or MATH140 (3) Calculus 1  
or equivalent (e.g., CEGEP objective 00UN)  
BIOL111 (3) Principles: Organismal Biology  
or AEB1120 (3) General Biology (M)

**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 corequisites listed above.**

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

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

**Domain: Required Courses (6 credits)**



- ENVR202 (3) The Evolving Earth  
 ENVR203 (3) Knowledge, Ethics and Environment  
 ENVR301 (3) Environmental Research Design  
 ENVR400 (3) Environmental Thought

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

- AGRI519 (6) Sustainable Development Plans (in Barbados)  
 ENVR401 (3) Environmental Research  
 ENVR451 (6) Research in Panama (in Panama)  
 ENVR466 (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)

- ECON230D1 (3) Microeconomic Theory  
 ECON230D2 (3) Microeconomic Theory  
 ECON405 (3) Natural Resource Economics  
 EPSC210 (3) Introductory Mineralogy  
 EPSC212 (4) Introductory Petrology

**Domain: Complementary Courses** (17 credits)

3 credits of ecology:

- BIOL308 (3) Ecological Dynamics  
 WILD205 (3) Principles of Ecology (M)

3 credits of statistics:

- AEMA310 (3) Statistical Methods 1 (M)  
 GEOG202 (3) Statistics and Spatial Analysis  
 MATH203 (3) Principles of Statistics 1

or equivalent

6 credits of economics:

- AGEC333 (3) Resource Economics (M)  
 ECON326 (3) Ecological Economics  
 ECON347 (3) Economics of Climate Change  
 ECON416 (3) Topics in Economic Development 2  
 ECON525 (3) Project Analysis

5 credits minimum of advanced courses:

- AGRI435 (3) Soil and Water Quality Management  
 AGRI550 (3) Sustained Tropical Agriculture (in Panama)  
 ANTH339 (3) Ecological Anthropology  
 BIOL305 (3) Animal Diversity  
 CHEE430 (3) Technology Impact Assessment  
 ECON305 (3) Industrial Organization  
 ECON313 (3) Economic Development 1  
 ECON314 (3) Economic Development 2  
 ECON408D1 (3) Public Sector Economics  
 ECON408D2 (3) Public Sector Economics  
 ECON412 (3) Topics in Economic Development 1  
 EPSC312 (3) Spectroscopy of Minerals  
 EPSC334 (3) Invertebrate Paleontology  
 ENVR465 (3) Environment and Social Change (at Bay of Fundy)

- GEOG302 (3) Environmental Management 1  
 GEOG322 (3) Environmental Hydrology  
 GEOG404 (3) Environmental Management 2 (in Panama)  
 GEOG498 (3) Humans in Tropical Environments (in Panama)

- NRSC437 (3) Assessing Environmental Impact (M)  
 SOIL410 (3) Soil Chemistry (M)  
 WILD415 (2) Conservation Law (M)

**14.5.3 Environment and Development Domain**

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.]

This Domain (54credits including Core) is open only to students in the B.A. Faculty Program in Environment.

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

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](http://www.mcgill.ca/minerva).

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

**Prerequisite or Corequisite Courses for Program**

3 credits of calculus:

- MATH139 Calculus  
 or MATH140 Calculus 1  
 or equivalent (e.g., CEGEP objective 00UN)

3 credits of basic science chosen from:

- BIOL111 Principles: Organismal Biology  
 or CHEM110 General Chemistry 1  
 or PHYS101 Introductory Physics - Mechanics  
 or their equivalents (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)

- ENVR200 (3) The Global Environment  
 ENVR201 (3) Society and Environment  
 ENVR202 (3) The Evolving Earth  
 ENVR203 (3) Knowledge, Ethics and Environment  
 ENVR301 (3) Environmental Research Design  
 ENVR400 (3) Environmental Thought

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

- AGRI519 (6) Sustainable Development Plans (in Barbados)  
 ENVR401 (3) Environmental Research  
 ENVR451 (6) Research in Panama (in Panama)  
 ENVR466 (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)

- ANTH339 (3) Ecological Anthropology  
 ECON313 (3) Economic Development 1  
 ECON314 (3) Economic Development 2  
 GEOG302 (3) Environmental Management 1

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

3 credits of microeconomics:

- AGEC200 (3) Principles of Microeconomics (M)  
 ECON208 (3) Microeconomic Analysis and Applications

3 credits of statistics:

- AEMA310 (3) Statistical Methods 1 (M)  
 GEOG202 (3) Statistics and Spatial Analysis  
 MATH203 (3) Principles of Statistics 1  
 PSYC204 (3) Introduction to Psychological Statistics  
 or equivalent

3 credits of ecology:

- BIOL308 (3) Ecological Dynamics  
 WILD205 (3) Principles of Ecology (M)

6 credits of advanced development courses:

- ANTH418 (3) Environment and Development







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](http://www.mcgill.ca/minerva).

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





**Prerequisite or Corequisite Courses for Domain**

FDSC211 (3)  
:

FDSC211

**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 co-requisites listed above.**

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

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

**Domain: Required Courses** (9 credits)

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

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#### **14.6.5 Land Surface Processes and Environmental Change Domain**

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.]

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.

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Telephone: (514) 398-7935

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, CO<sub>2</sub> 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 biogeochemical processes at the atmosphere-lithosphere interface, which fashion land surface habitats and determine their biological 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](http://www.mcgill.ca/minerva).

**Courses offered at Macdonald Campus are marked with an (M). (Core Required 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**



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

**Prerequisite or Corequisite Courses for Domain**

- FDSC211 (3) Biochemistry 1 (M)  
or BIOL112 (3) Cell and Molecular Biology  
or CEGEP equivalent (e.g., CEGEP objective 00XU)
- FDSC230 (4) Organic Chemistry (M)  
or CHEM212 (4) Introductory Organic Chemistry 1  
or CEGEP equivalent (e.g., CEGEP objective 00XV)

**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)**

- ENVR200 (3) The Global Environment
- ENVR201 (3) Society and Environment
- ENVR202 (3) The Evolving Earth
- ENVR203 (3) Knowledge, Ethics and Environment
- ENVR301 (3) Environmental Research Design
- ENVR400 (3) Environmental Thought

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

- AGRI519 (6) Sustainable Development Plans (in Barbados)
- ENVR401 (3) Environmental Research
- ENVR451 (6) Research in Panama (in Panama)
- ENVR466 (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

- WILD200 (3) Comparative Zoology (M)  
or BIOL305 (3) Animal Diversity  
or PLNT201 (3) Comparative Plant Biology (M)
- WILD205 (3) Principles of Ecology (M)  
or BIOL308 (3) Ecological Dynamics
- GEOG305 (3) Soils and Environment  
or SOIL210 (3) Principles of Soil Science (M)

6 credits statistics and GIS methods

- BREE430 (3) (3) Comparativ73 equivalen08ciples try 1

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**14.6.7 Water Environments and Ecosystems Domain**

This Domain is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or 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.

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

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.]

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  
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Telephone: (514) 398-4306

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](http://www.mcgill.ca/minerva).

**Courses offered at Macdonald Campus are marked with an (M). (Core Required 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)**

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

- AGRI519 (6) Sustainable Development Plans (in Barbados)
- ENVR401 (3) Environmental Research
- ENVR451 (6) Research in Panama (in Panama)
- ENVR466 (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)

- ATOC215 (3) Oceans, Weather and Climate

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

6 credits chosen from:

- BREE217 (3) Hydrology and Water Resources (*M*)
- or GEOG322 (3) Environmental Hydrology
- WILD205 (3) Principles of Ecology (*M*)
- or BIOL308 (3) Ecological Dynamics

3 credits of math and statistics from:

- AEMA202 (3) Intermediate Calculus (*M*)
- AEMA310 (3) Statistical Methods 1 (or equivalent) (*M*)
- MATH203 (3) Principles of Statistics 1
- MATH222 (3) Calculus 3

3 credits chosen from:

- BIOL331 (3) Ecology/Behaviour Field Course (at Mont St. Hilaire)
- GEOG495 (3) Field Studies - Physical Geography (at Mont St. Hilaire)
- GEOG497 (3) Ecology of Coastal Waters (at Bay of Fundy) or an equivalent aquatic field course

3 credits chosen from:

- AGEC333 (3) Resource Economics (*M*)
- ANTH339 (3) Ecological Anthropology
- ANTH418 (3) Environment and Development
- ECON225 (3) Economics of the Environment
- ECON326 (3) 3) Tj 54 0 TD 0.110to the program; m: or anM46c4RLC0136 Ponomics off Anthropology

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**Water Environments and Ecosystems Domain – Physical Stream**

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.]

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  
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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](http://www.mcgill.ca/minerva).

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

**Recommended Corequisite Course for Domain**

**NOTE: Students are required to take a maximum of 30 credits above 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)

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

**Domain: Required Courses** (9 credits)

**Domain – Complementary Courses** (30 credits)





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### 14.7.2 Earth Sciences and Economics Domain

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to [www.mcgill.ca/courses](http://www.mcgill.ca/courses) (Course Calendars) in July for details.]

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

## **14.8 Diploma in Environment**

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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 coursework. The Diploma requires 30 credits of full-time or part-time