

14 McGill School of Environment

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14.1 The School

14.1.1 Location

For advising, contact:

Program Coordinator, Mr. Peter Barry
 Telephone: (514) 398-4306
 Fax: (514) 398-1643
 E-mail: info.mse@mcgill.ca

Website: www.mcgill.ca/mse

Downtown Campus

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

Macdonald Campus

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

14.1.2 Administrative Officers

Deborah Buszard; B.Sc.(Bath), Ph.D.(Lond.)
Dean, Faculty of Agricultural and Environmental Sciences

John Hall; B.A.(Oxford), M.A.(Penn St.), Ph.D.(LSE)
Dean, Faculty of Arts

Alan G. Shaver; B.Sc.(Car.), Ph.D.(M.I.T.)
Dean, Faculty of Science

Nigel Roulet; B.Sc., M.Sc.(Trent), Ph.D.(McM.) **Director**

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

14.1.3 Academic Staff

Professors

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

Colin Chapman; B.Sc., M.A., Ph.D.(Alta.) *(joint appoint. with Anthropology)*

Nigel Roulet; B.Sc., M.Sc.(Trent); Ph.D.(McM.) *(joint appoint. with Geography) (on leave 2005)*

Assistant Professors

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

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

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

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

Brian Leung; B.Sc.(UBC); Ph.D.(Carleton) *(joint appoint. with Biology)*

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

Garry Peterson; B.Sc. (Waterloo), M.Sc., Ph.D. (Florida) *(joint appoint. with Geography)*

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

Raja Sengupta; B.Sc. (Bombay), M.Sc.(I.I.T), Ph.D. (Illinois) *(joint appoint. with Geography)*

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

Renée Sieber; B.Sc.(Mich. St.), M.P.A.(W. Mich.), Ph.D.(Rutgers) *(joint appoint. with Geography)*

Faculty Lecturers

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

George McCourt; B.Sc., M.Sc (Alta.); M.Sc.(McG.)

Joan Marshall; B.A. McG.), M.A.(Toronto), Ph.D. (McG.)

Associate Members

Agricultural Economics: John Henning, Paul Thomassin

Anthropology: John Galaty, Colin H. Scott

Architecture: Avi Friedman

Atmospheric and Oceanic Sciences: Parisa Ariya, Charles Lin

Avian Science and Conservation Centre: David Bird

Brace Centre for Water Resources Management: Chandra Madramootoo

Biology: Martin Lechowicz, Catherine Potvin

Bioresource Engineering: Suzelle Barrington, Robert Bonnell, Robert Kok

Chemistry: Bill Chan

Civil Engineering and Applied Mechanics: Susan Gaskin, Subhasis Ghoshal, Van-Thanh-VanNguyen, Jim Nicell

Developing Area Studies: Rosalind Boyd

Dietetics and Human Nutrition, School of: Laurie Chan, Tim Johns, Harriet Kuhnlein

Earth and Planetary Sciences: Don Baker, Alfonso Mucci, JeannePaquette
 Economics: Robert Cairns, Myron Frankman, Chris Green, Franque Grimard, Tom Naylor
 Education, Integrated Studies: Elizabeth Wood
 Epidemiology and Biostatistics: Mark Goldberg
 Geography: Peter Brown, Gail Chmura, Oliver Coomes, Thom Meredith, Tim Moore, Wayne H. Pollard, Nigel Roulet
 History: Myron Echenberg
 Law, Faculty of: Jane Glenn
 Management, Faculty of: Steve Maguire
 Medicine, Ethics, Law: Margaret Somerville
 Mining and Metallurgical Engineering: Jim Finch
 Natural Resource Sciences: Benoit Côté, Mark Curtis, Brian Driscoll, Jim W. Fyles, William Hendershot, Roger Titman, Terry Wheeler
 Parasitology, Institute of: Marilyn Scott, James Smith
 Pathology: Bruce Case, Edith Zorychta
 Philosophy: Philip Buckley
 Plant Science: Pierre Dutilleul, Marc Fortin, Don Smith, Marcia Waterway
 Political Science: Hudson Meadwell, Philip Oxhorn
 Psychology: Daniel Levitin
 Redpath Museum: Graham Bell, David M. Green
 Sociology: Uli Locher
 Urban Planning, School of: Jeanne Wolfe

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. 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.

14.1.5 Goals of the School

The McGill School of Environment has the following goals:

- to provide an exciting and rigorous program that allows for intellectual growth in the comprehension of environmental systems or components of the environment;
- to impart to students an understanding of current environmental concerns;
- 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 environmental issues.

14.2 Admission, Registration and Regulations

14.2.1 Admission

Students may be admitted to a B.A., B.Sc.(Ag.Env.Sc.), or a B.Sc. program, offered by the MSE on the University's two campuses: the Macdonald Campus and the Downtown Campus. They regis-

ter as students within their Faculty of admission and are governed by all rules and regulations of that Faculty.

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

Please see section 3.5 "General Admission and Documentation Requirements".

14.2.2 Degree Requirements

To be eligible for a B.A. degree, students must fulfill all the faculty and program requirements as indicated under Arts (see section 5.3 "Faculty Degree Requirements").

To be eligible for a B.Sc.(Ag.Env.Sc.) degree, students must fulfill all the faculty and program requirements as indicated under Agricultural and Environmental Sciences (see section 3.5 "General Admission and Documentation Requirements").

To be eligible for a B.Sc. degree, students must fulfill all the faculty and program requirements as indicated under Science Faculty Degree Requirements, see section 12.3.

To be eligible for the Diploma in Environment, students must fulfill all program requirements as specified in section 14.8 "Diploma in Environment".

14.2.3 Important Information about Program Selection

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

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

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

(None of the above applies to students in the Minor or Diploma Programs.)

14.2.4 Course Numbering System at McGill

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

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

14.2.5 Examination Regulations

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

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

14.2.6 Courses outside the Student's Faculty

Students in the School's B.A., B.Sc., and B.Sc.(Ag.Env.Sc.) programs may take courses outside their faculty according to the

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

- Arts students, see Faculty of Arts, [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. 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 (Course Calendars) in July for details.

14.4 Minor in Environment

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

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

To obtain a Minor in Environment, students must:

- a. register for the Minor on-line, using Minerva;
- b. submit their program of courses already taken and to be taken for the Minor in Environment to the MSE Program Coordinator for approval;
- c. pass all courses counted towards the Minor with a **grade of C or higher**;
- d. complete 18 credits from the courses listed below not otherwise counted towards the student's Major program or concentration or a second Minor program; and
- e. ensure that all the credits specified in (c) above are taken outside the discipline or field of the student's Major program or concentration.

14.4.1 Minor Concentration in Environment

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

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

Complementary Courses (18 credits)

12 credits selected from the MSE core courses:

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

6 credits in environmentally related subjects selected with the approval of the program adviser, at least 3 credits must be in natural sciences.

A list of suggested courses is available on the MSE website in "Undergraduate Programs: Minor". Students are also encouraged to examine the course lists of the various Domains in the Environment Program on the next few pages of the Calendar for courses which interest them.

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.

14.4.2 Minor in Environment

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

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

Complementary Courses (18 credits)

12 credits selected from the MSE core courses:

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

6 credits in environmentally related subjects selected with the approval of the program adviser, at least 3 credits must be in social sciences.

A list of suggested courses is available on the MSE website in "Undergraduate Programs: Minor". Students are also encouraged to examine the course lists of the various Domains in the Environment Program on the next few pages of the Calendar for courses which interest them.

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.

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.

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

New programs are under consideration for the 2005-06 academic year. Visit the MSE Website or go to 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 (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
 E-mail: johns@macdonald.mcgill.ca
 Telephone: (514) 398-7847

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

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

Courses offered at Macdonald Campus are marked with an (M). (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)
 or equivalent (e.g., CEGEP objective 00UK or equivalent)

NOTE: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses, but does not include the Program prerequisites or 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: Required Courses (6 credits)

PARA410 (3) Environment and Infection (M)
 SOCI234 (3) Population and Society

Domain: Complementary Courses (27 credits)

12 credits of Fundamentals (maximum 3 credits from any one category):

Health and Pollution

- ANTH227 (3) Medical Anthropology
NRSC333 (3) Physical and Biological Aspects of Pollution (M)

Economics

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

Nutrition

- NUTR200 (3) Contemporary Nutrition
NUTR207 (3) Nutrition and Health (M)

Statistics

- AEMA310 (3) Statistical Methods 1 (M)
MATH203 (3) Principles of Statistics 1
SOC1350 (3) Statistics in Social Research or equivalent

9 credits from List A (maximum 3 credits from any one category):

Hydrology and Climate

- BREE217 (3) Hydrology and Water Resources (M)
GEOG321 (3) Climatic Environments
GEOG322 (3) Environmental Hydrology
NRSC510 (3) Agricultural Micrometeorology (M)

Agriculture

- AGRI210 (3) Agro-Ecological History (M)
AGRI340 (3) Principles of Ecological Agriculture (M)
AGRI411 (3) International Agriculture (M)

Decision Making

- AGEC242 (3) Management Theories and Practices (M)
ECON440 (3) Health Economics
PHIL343 (3) Biomedical Ethics

Biology Fundamentals

- BIOL200 (3) Molecular Biology
BIOL205 (3) Biology of Organisms
BIOL308 (3) Ecological Dynamics
FDSC211 (3) Biochemistry 1 (M)
PHGY202 (3) Human Physiology: Body Functions
PLNT201 (3) Comparative Plant Biology (M)
WILD200 (3) Comparative Zoology (M)
WILD205 (3) Principles of Ecology (M)

Development and Ecology

- ANTH212 (3) Anthropology of Development
ANTH339 (3) Ecological Anthropology
GEOG300 (3) Human Ecology in Geography
SOC1254 (3) Development and Underdevelopment

6 credits from List B (Maximum 3 credits from any one category):

Advanced Ecology

- BIOL465 (3) Conservation Biology
BIOL553 (3) Neotropical Environments (in Panama)
WILD410 (3) Wildlife Ecology (M)
WOOD410 (3) The Forest Ecosystem (M)

Pest Management

- BIOL350 (3) Insect Biology and Control
ENTO352 (3) Control of Insect Pests (M)
PLNT361 (3) Pest Management and the Environment (M)

Techniques and Management

- BREE330 (3) GIS for Biosystems Engineering (M)
CHEE230 (3) Environmental Aspects of Technology
GEOG201 (3) Introductory Geo-Information Science
GEOG302 (3) Environmental Management 1

Social Change

- EDER461 (3) Society and Change
ENVR465 (3) Environment and Social Change (at Bay of Fundy)

- HIST292 (3) History and the Environment

Immunology and Infectious Disease

- MIMM314 (3) Immunology
MIMM324 (3) Fundamental Virology

- MIMM413 (3) Parasitology
PARA438 (3) Immunology (M)
Populations and Place
CANS407 (3) Regions of Canada (at Bay of Fundy)
GEOG498 (3) Humans in Tropical Environments (in Panama)
PSYC533 (3) International Health Psychology
SOCI520 (3) Migration and Immigrant Groups
SOCI550 (3) Developing Societies
SOCI565 (3) Social Change in Panama (in Panama)

14.5.2 Economics and the Earth's Environment Domain

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

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

Adviser: Professor Don Baker
E-mail: donb@eps.mcgill.ca
Telephone: (514) 398-7485

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. This knowledge is not always enough, as economics often plays a controlling role in how we use and abuse our environment.

This Domain educates students in the fundamentals of economics and Earth sciences. The fundamentals of economics are provided, as is their application to the effects of economic choices on Earth's environment. Examples of these applications include the economic effects of public policy towards resource industries and methods of waste disposal, and the potential effects of global warming on the global economy. Students also learn of minerals, rocks, soils, and waters which define much of Earth's environment and how these materials interact with each other and with the atmosphere. Courses in specific subdisciplines of Earth sciences combined with courses presenting a global vision of how the Earth and its environment operate provide the student with the necessary knowledge of geologic processes. Examples of this knowledge include the effects of mineral and energy extraction on the environment and how industrial waste interacts with solids and liquids in the environment. The Earth science and economics studies merge in the final year when the students apply what they have learned in the Domain to current environmental issues.

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

Courses offered at Macdonald Campus are marked with an (M). (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 34 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes Core and Required courses, but does not include the Domain prerequisites or co-requisites 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: 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 (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.

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

- GEOG408 (3) Geography of Development
 GEOG410 (3) Geography of Underdevelopment: Current Problems

3 credits of natural sciences:

- AGRI550 (3) Sustained Tropical Agriculture (in Panama)
 BIOL465 (3) Conservation Biology
 BIOL553 (3) Neotropical Environments (in Panama)
 GEOG305 (3) Soils and Environment
 GEOG322 (3) Environmental Hydrology
 NUTR403 (3) Nutrition in Society (M)
 NUTR501 (3) Nutrition in Developing Countries (M)
 PARA410 (3) Environment and Infection (M)

3 credits of social sciences:

- AGEC333 (3) Resource Economics (M)
 AGEC442 (3) Economics of International Development (M)
 AGRI210 (3) Agro-Ecological History (M)
 ANTH439 (3) Theories of Development
 ANTH445 (3) Property and Land Tenure
 CANS407 (3) Regions of Canada (at Bay of Fundy)
 ECON326 (3) Ecological Economics
 ECON405 (3) Natural Resource Economics
 ENVR465 (3) Environment and Social Change (at Bay of Fundy)
 GEOG201 (3) Introductory Geo-Information Science
 GEOG300 (3) Human Ecology in Geography
 GEOG331 (3) Urban Social Geography
 GEOG404 (3) Environmental Management 2 (in Panama or Africa)
 GEOG408 (3) Geography of Development
 GEOG496 (3) Regional Geographical Excursion (in Barbados)
 GEOG498 (3) Humans in Tropical Environments (in Panama)
 GEOG510 (3) Humid Tropical Environments
 GEOG551 (3) Environmental Decisions
 INTD497 (3) Research Seminar on International Development
 MGPO440 (3) Strategies for Sustainability
 POLI445 (3) IPE: NorthSouth Relations
 POLI472 (3) Developing Areas/ Social Movements
 SOCI565 (3) Social Change in Panama (in Panama)

14.6 Major in Environment – B.Sc.(Ag.Env.Sc.) and B.Sc.

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

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

- 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.
- Domain:** Domains provide a trans-disciplinary study of a particular theme or component of the environment.
- Senior Core and Research:** In the two senior courses of the Core, students will apply the general and specialized knowledge that they have gained in the program to the analysis of some specific, contemporary environmental problems.

To obtain a Major in Environment, students must:

- register in a Domain, on-line using Minerva;
- pass all courses counted towards the Major with **a grade of C or higher**;

- confirm that their course selection satisfies the required components of the MSE Core and their chosen Domain, and that the complementary courses are approved courses in their chosen Domain; and
- fulfill all faculty requirements as specified by the faculty in which they are registered: for the B.Sc.(Ag.Env.Sc.) refer to Agricultural and Environmental Sciences [section 13.5 "Faculty Information and Regulations"](#); for the B.Sc. [see section 12.3 "Faculty Degree Requirements"](#). This includes meeting the minimum credit requirement as specified in their letter of admission.

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

Core: Required Courses (18 credits)

The Core courses are listed below in the Domain descriptions.

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

The research courses are listed in the Domain descriptions.

Domain (36 to 45 credits – depending upon Domain selected) one MSE Domain selected from those available to students in the Major.

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

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

Currently available for B.Sc. only ([see section 14.7 "Major in Environment – B.Sc."](#)):

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

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

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 (Course Calendars) in July for details.

14.6.1 Biodiversity and Conservation Domain

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

This Domain (63creditsincluding 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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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 mecha-

nism of selection acting over different scales of space and time. This gives rise to a distinctive set of principles and generalizations that regulate rates of diversification and levels of diversity, as well as the abundance or rarity of different species. Conservation biology constitutes the application of these principles in the relevant social and economic context to the management of natural systems, with the object of preventing the extinction of rare species and maintaining the diversity of communities. As the impact of industrialization and population growth on natural systems has become more severe, conservation has emerged as an important area of practical endeavour.

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

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

- 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 (9 credits)

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

- BIOL304 (3) Evolution
- BIOL305 (3) Animal Diversity
- BIOL465 (3) Conservation Biology

Domain: Complementary Courses (33 credits)

6 credits of ecology and statistics:

- BIOL308 (3) Ecological Dynamics
- or WILD205 (3) Principles of Ecology (M)
- BIOL373 (3) Biometry
- or AEMA310 (3) Statistical Methods 1 (M)

9 credits, interface between science, policy and management:

- ANTH418 (3) Environment and Development
- ECON208 (3) Microeconomic Analysis and Applications
- ECON225 (3) Economics of the Environment
- GEOG302 (3) Environmental Management 1
- GEOG408 (3) Geography of Development
- GEOG410 (3) Geography of Underdevelopment: Current Problems

3 credits of field courses:

- BIOL331 (3) Ecology/Behaviour Field Course (at Mont St. Hilaire)
- BIOL334 (3) Applied Tropical Ecology (in Barbados)
- BIOL553 (3) Neotropical Environments (in Panama)
- GEOG495 (3) Field Studies - Physical Geography (at Mont St. Hilaire)
- GEOG497 (3) Ecology of Coastal Waters (at Bay of Fundy)
- GEOG499 (3) Subarctic Field Studies (in Schefferville)
- WILD475 (3) Desert Ecology (in Arizona)

6 credits of general scientific principles:

- BREE430 (3) GIS for Bioresource Management (M)

- or GEOG306 (3) Raster Geo-Information Science
 - BIOL324 (3) Ecological Genetics
 - BIOL341 (3) History of Life
 - BIOL432 (3) Limnology
 - BIOL441 (3) Biological Oceanography
 - BIOL442 (3) Marine Biology
 - BIOL505 (3) Diversity and Systematics Seminar
 - GEOG272 (3) Earth's Changing Surface
 - GEOG321 (3) Climatic Environments
 - GEOG350 (3) Ecological Biogeography
 - MICR331 (3) Microbial Ecology (M)
 - NRSC437 (3) Assessing Environmental Impact (M)
 - PLNT460 (3) Plant Ecology (M)
 - WILD313 (3) Phylogeny and Zoogeography (M)
 - WILD375 (3) Issues: Environmental Sciences (M)
 - WILD410 (3) Wildlife Ecology (M)
 - WOOD410 (3) The Forest Ecosystem (M)
 - WOOD420 (3) Environmental Issues: Forestry (M)
- (A second field course from the Domain curriculum may also be taken)

3 credits of social science:

- AGEC333 (3) Resource Economics (M)
 - ANTH339 (3) Ecological Anthropology
 - ANTH416 (3) Environment/Development: Africa (in Africa)
 - ECON326 (3) Ecological Economics
 - ENVR465 (3) Environment and Social Change (at Bay of Fundy)
 - GEOG404 (3) Environmental Management 2 (in Panama)
 - GEOG498 (3) Humans in Tropical Environments (in Panama)
 - GEOG510 (3) Humid Tropical Environments
 - WILD415 (2) Conservation Law (M)
- (If this course is taken, 1 additional credit of complementary courses must be taken.)
- WILD421 (3) Wildlife Conservation (M)

6 credits, organisms and diversity:

- BIOL327 (3) Herpetology
- BIOL335 (3) Marine Mammals (at Bay of Fundy)
- BIOL350 (3) Insect Biology and Control
- BIOL358 (3) Canadian Flora
- or PLNT358 (3) Flowering Plant Diversity (M)
- ENTO352 (3) Control of Insect Pests (M)
- ENTO440 (3) Systematic Entomology (M)
- ENVR540 or (3) Ecology of Species Invasions
- BIOL540
- PLNT304 (3) Biology of Fungi (M)
- PLNT458 (3) Flowering Plant Systematics (M)
- WILD212 (3) Evolution and Systematics (M)
- WILD307 (3) Natural History of Vertebrates (M)
- WILD350 (3) Mammalogy (M)
- WILD420 (3) Ornithology (M)
- WILD424 (3) Parasitology (M)

14.6.2 Ecological Determinants of Health Domain

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

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

For example, agricultural practices shift the balance between beneficial and harmful ingredients of food. Use of insecticides presents dilemmas with regard to the environment, economics and

human health. The distribution of infectious diseases is influenced by the climatic conditions that permit vectors to coexist with man, by deforestation, by urbanization, and by human interventions ranging from the building of dams to provision of potable water.

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

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

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

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

Ecological Determinants of Health Domain – Cellular Stream

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

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

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

Core: Required Courses (18 credits)

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 (6 credits)

PARA410	(3)	Environment and Infection (M)
SOCI234	(3)	Population and Society

Domain - Cellular Stream: Complementary Courses

(36credits)

18 credits of Fundamentals, maximum of 3 credits from any one category:

Toxicology

NUTR420	(3)	Toxicology and Health Risks (M)
PHAR303	(3)	Principles of Toxicology

Cellular Biology

AEBI202	(3)	Cellular Biology (M)
ANSC234	(3)	Biochemistry 2 (M)
BIOL201	(3)	Cell Biology and Metabolism

Genetics

BIOL202	(3)	Basic Genetics
CELL204	(4)	Genetics (M)

Molecular Biology

BIOL200	(3)	Molecular Biology
FDSC211	(3)	Biochemistry 1 (M)

Statistics

AEMA310	(3)	Statistical Methods 1(M)
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MATH203 (3) Principles of Statistics 1 or equivalent

Nutrition

ANSC330	(3)	Fundamentals of Nutrition (M)
NUTR307	(3)	Human Nutrition (Video conference Downtown and Macdonald)

12 credits chosen from Human Health, maximum of 3 credits from any one category:

Immunology and Pathogenicity

MICR341	(3)	Mechanisms of Pathogenicity (M)
MIMM314	(3)	Immunology
PARA438	(3)	Immunology (M)
PATH300	(3)	Human Disease

Infectious Disease

MIMM324	(3)	Fundamental Virology
MIMM413	(3)	Parasitology
PARA400	(3)	Eucaryotic Cells and Viruses (M)
WILD424	(3)	Parasitology (M)

Nutrition

NUTR403	(3)	Nutrition in Society (M)
NUTR512	(3)	Herbs, Foods and Phytochemicals (Video conference Downtown and Macdonald)

Drugs and Hormones

ANSC424	(3)	Metabolic Endocrinology (M)
PHAR300	(3)	Drug Action

Physiology

ANSC323	(4)	Mammalian Physiology (M)
PHGY209	(3)	Mammalian Physiology 1

6 credits chosen from the Natural Environment, maximum of 3 credits from any one category:

Hydrology and Climate

BREE217	(3)	Hydrology and Water Resources (M)
GEOG321	(3)	Climatic Environments
GEOG322	(3)	Environmental Hydrology
NRSC510	(3)	Agricultural Micrometeorology (M)

Techniques and Management

BREE322	(3)	Organic Waste Management (M)
CHEE230	(3)	Environmental Aspects of Technology
GEOG302	(3)	Environmental Management 1
WILD437	(3)	Assessing Environmental Impact (M)

Pest Management

BIOL350	(3)	Insect Biology and Control
ENTO352	(3)	Control of Insect Pests (M)
PLNT361	(3)	Pest Management and the Environment (M)

Pollution Control and Management

BREE518	(3)	Bio-Treatment of Wastes (M)
CHEM307	(3)	Analytical Chemistry of Pollutants
NRSC333	(3)	Physical and Biological Aspects of Pollution (M)

Ecology

BIOL432	(3)	Limnology
BIOL465	(3)	Conservation Biology
BIOL553	(3)	Neotropical Environments (in Panama)
GEOG497	(3)	Ecology of Coastal Waters (at Bay of Fundy)
MICR331	(3)	Microbial Ecology (M)
PLNT304	(3)	Biology of Fungi (M)
PLNT460	(3)	Plant Ecology (M)
WILD410	(3)	Wildlife Ecology (M)
WOOD410	(3)	The Forest Ecosystem (M)

Ecological Determinants of Health Domain – Population Stream

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

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

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

Core: Required Courses (18 credits)

- 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 (6 credits)

- PARA410 (3) Environment and Infection (M)
- SOCI234 (3) Population and Society

Domain - Population Stream: Complementary Courses (36credits)

18 credits of fundamentals, maximum of 3 credits from each category:

Toxicology

- NUTR420 (3) Toxicology and Health Risks (M)
- PHAR303 (3) Principles of Toxicology

Genetics

- BIOL202 (3) Basic Genetics
- CELL204 (4) Genetics (M)

Biology

- BIOL200 (3) Molecular Biology
- BIOL201 (3) Cell Biology and Metabolism
- FDSC211 (3) Biochemistry 1 (M)

Statistics

- AEMA310 (3) Statistical Methods 1 (M)
- MATH203 (3) Principles of Statistics 1

equivalent

Nutrition

- ANSC330 (3) Fundamentals of Nutrition (M)
- NUTR207 (3) Nutrition and Health (M)
- NUTR307 (3) Human Nutrition (Video conference Downtown and Macdonald)

Advanced Ecology

- AEMA306 (3) Mathematical Methods in Ecology (M)
- BIOL465 (3) Conservation Biology
- BIOL553 (3) Neotropical Environments (in Panama)
- GEOG497 (3) Ecology of Coastal Waters (at Bay of Fundy)
- MICR331 (3) Microbial Ecology (M)
- PLNT460 (3) Plant Ecology (M)
- WILD410 (3) Wildlife Ecology (M)
- WOOD410 (3) The Forest Ecosystem (M)

6 credits from the following List A, maximum of 3 credits from each category:

Hydrology, Climate, and Agriculture

- BREE217 (3) Hydrology and Water Resources (M)
- AGRI340 (3) Principles of Ecological Agriculture (M)
- AGRI550 (3) Sustained Tropical Agriculture (in Panama)
- GEOG321 (3) Climatic Environments
- GEOG322 (3) Environmental Hydrology
- NRSC510 (3) Agricultural Micrometeorology (M)

Decision Making and Social Change

- AGEC242 (3) Management Theories and Practices (M)
- ECON208 (3) Microeconomic Analysis and Applications
- EDER461 (3) Society and Change

- ENVR465 (3) Environment and Social Change (at Bay of Fundy)
 - GEOG302 (3) Environmental Management 1
 - GEOG404 (3) Environmental Management 2 (in Panama)
 - PHIL343 (3) Biomedical Ethics
- Development and History*
- AGRI210 (3) Agro-Ecological History (M)
 - ANTH212 (3) Anthropology of Development
 - HIST292 (3) History and the Environment
 - SOCI254 (3) Development and Underdevelopment

12 credits from the following list B, maximum of 3 credits from each category:

Techniques and Management

- BREE430 (3) GIS for Bioresource Management (M)
- CHEE230 (3) Environmental Aspects of Technology
- GEOG201 (3) Introductory Geo-Information Science
- NRSC437 (3) Assessing Environmental Impact (M)

Immunology and Infectious Disease

- EPIB637 (3) Infectious and Parasitic Disease Epidemiology

- MIMM314 (3) Immunology
- MIMM324 (3) Fundamental Virology
- MIMM413 (3) Parasitology
- PARA400 (3) Eucaryotic Cells and Viruses (M)
- PARA438 (3) Immunology (M)
- WILD424 (3) Parasitology (M)

Nutrition and Agriculture

- NUTR403 (3) Nutrition in Society (M)
- AGRI411 (3) International Agriculture (M)
- NUTR501 (3) Nutrition in Developing Countries (M)
- NUTR512 (3) Herbs, Foods and Phytochemicals (Video conference Downtown and Macdonald)

Populations and Place

- CANS407 (3) Regions of Canada (at Bay of Fundy)
- GEOG300 (3) Human Ecology in Geography
- GEOG498 (3) Humans in Tropical Environments (in Panama)

- PSYC533 (3) International Health Psychology

Pollution and Pest Management

- BREE322 (3) Organic Waste Management (M)
- BIOL350 (3) Insect Biology and Control
- ENTO352 (3) Control of Insect Pests (M)
- NRSC333 (3) Physical and Biological Aspects of Pollution (M)
- PLNT361 (3) Pest Management and the Environment (M)

14.6.3 Environmetrics Domain

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

This Domain (63credits 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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In view of the crucial need for sound study design and appropriate statistical methods for analyzing environmental changes and their impacts on humans and various life forms and their ecological relationships, this program is intended to provide students with a strong background in the use of statistical methods of data analysis in environmental sciences.

Graduates will be capable of effectively participating in the design of environmental studies and adequately analyzing data for use by the environmental community. Accordingly, the list of courses for the Environmetrics Domain is composed primarily of statistics courses and mathematically oriented courses with biological and ecological applications. The list is completed by gen-

eral courses that refine the topics introduced in the MSE core courses by focusing on the ecology of living organisms, soil sciences or water resources, and impact assessment. These courses should allow the students to understand their interlocutors and be understood by them in their future job. Students can further develop their background in applied or mathematical statistics and their expertise in environmental sciences by taking complementary courses along each of two axes: statistics and mathematics, and environmental sciences. An internship is also offered to students to provide them with preliminary professional experience.

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

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

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 Course (6 credits)

AEMA403	(3)	Environmetrics Stage (internship) (M)
AEMA414	(3)	Temporal and Spatial Statistics (M)

Domain - Complementary Courses (36 credits, minimum)
15 credits from:

WILD205	(3)	Principles of Ecology (M)
or BIOL308	(3)	Ecological Dynamics
MIME308	(3)	Social and Economic Impacts of Technology
or NRSC437	(3)	Assessing Environmental Impact (M)
AEMA306	(3)	Mathematical Methods in Ecology (M)
or BIOL309	(3)	Mathematical Models in Biology
BREE430	(3)	GIS for Bioresource Management (M)
or GEOG201	(3)	Introductory Geo-Information Science
AEMA411	(3)	Experimental Designs (M)
or CIVE555	(3)	Environmental Data Analysis

3 credits of basic environmental science:

BREE217	(3)	Hydrology and Water Resources (M)
CIVE323	(3)	Hydrology and Water Resources
GEOG305	(3)	Soils and Environment
GEOG322	(3)	Environmental Hydrology
GEOG350	(3)	Ecological Biogeography
SOIL210	(3)	Principles of Soil Science (M)

6 credits of Statistics, one of the following two options:

Option 1:

MATH323	(3)	Probability
MATH324	(3)	Statistics

Option 2:

AEMA310	(3)	Statistical Methods 1 (M)
or BIOL373	(3)	Biometry

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

6 credits of statistics and mathematics chosen from:

BREE252	(3)	Computing for Engineers (or equivalent) (M)
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BREE319	(3)	Engineering Mathematics (or equivalent) (M)
GEOG351	(3)	Quantitative Methods
GEOG501	(3)	Modelling Environmental Systems
MATH223	(3)	Linear Algebra
MATH423	(3)	Regression and Analysis of Variance
MATH447	(3)	Stochastic Processes
MATH525	(4)	Sampling Theory and Applications
SOCI461	(3)	Quantitative Data Analysis
SOCI504	(3)	Quantitative Methods 1
SOCI505	(3)	Quantitative Methods 2
SOCI580	(3)	Social Research Design and Practice.

6 credits, minimum, of environmental sciences chosen from:

AGRI550	(3)	Sustained Tropical Agriculture (in Panama)
BIOL331	(3)	Ecology/Behavior Field Course (at Mont St. Hilaire)
BIOL553	(3)	Neotropical Environments (in Panama)
GEOG300	(3)	Human Ecology in Geography
GEOG302	(3)	Environmental Management 1
GEOG404	(3)	Environmental Management 2 (in Panama)
GEOG494	(3)	Urban Field Studies
GEOG497	(3)	Ecology of Coastal Waters (at Bay of Fundy)
GEOG499	(3)	Subarctic Field Studies (in Schefferville)
MIME451	(3)	Environmental Controls: Met'l Plants
NRSC333	(3)	Physical and Biological Aspects of Pollution (M)
PLNT460	(3)	Plant Ecology (M)
WILD313	(3)	Phylogeny and Zoogeography (M)
WILD401	(4)	Fisheries and Wildlife Management (M)
WOOD300	(3)	Urban Forests and Trees (M)
WOOD420	(3)	Environmental Issues: Forestry (M)

14.6.4 Food Production and Environment Domain

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to 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 in Environment program.

Adviser: Professor Sylvie de Blois
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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.

With a judicious choice of courses, graduates of this Domain may be eligible to apply for membership in the Ordre des agronomes du Québec (OAQ) and the Agricultural Institute of Canada (AIC). See the MSE website for details at www.mcgill.ca/mse: (BSc Programs: Food Production and Environment Domain).

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

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

- 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 (9 credits)

- AGRI210 (3) Agro-Ecological History (M)
- PLNT211 (3) Principles of Plant Science (M)
- PLNT300 (3) Cropping Systems (M)

Domain: Complementary Courses (33 credits)

15 or 16 credits of Basic Sciences:

- AEMA310 (3) Statistical Methods 1 (M)
or MATH203 (3) Principles of Statistics 1
or equivalent
- AGRI340 (3) Principles of Ecological Agriculture (M)
or ANSC250 (3) Principles of Animal Science (M)
- BIOL202 (3) Basic Genetics
or CELL204 (4) Genetics (M)
- GEOG305 (3) Soils and Environment
or SOIL210 (3) Principles of Soil Science (M)
- WILD205 (3) Principles of Ecology (M)
or BIOL308 (3) Ecological Dynamics

12 credits of Applied Sciences:

- BREE217 (3) Hydrology and Water Resources (M)
or GEOG322 (3) Environmental Hydrology
- BREE322 (3) Organic Waste Management (M)
- BREE518 (3) Bio-Treatment of Wastes (M)
- AGRI341 (3) Ecological Agricultural Systems (M)
- AGRI411 (3) International Agriculture (M)
- AGRI435 (3) Soil and Water Quality Management (M)
- AGRI550 (3) Sustained Tropical Agriculture (in Panama)
- ANSC501 (3) Advanced Animal Production Systems (M)
- BIOL465 (3) Conservation Biology
- BIOL553 (3) Neotropical Environments (in Panama)
- FDSC200 (3) Introduction to Food Science (M)
or NUTR207 (3) Nutrition and Health (M)
- FDSC535 (3) Food Biotechnology (M)
- GEOG302 (3) Environmental Management 1
- MICR331 (3) Microbial Ecology (M)
- NRSC333 (3) Physical and Biological Aspects of Pollution (M)
- NRSC437 (3) Assessing Environmental Impact (M)
- NUTR403 (3) Nutrition in Society (M)
- NUTR420 (3) Toxicology and Health Risks (M)
- PARA410 (3) Environment and Infection (M)
- PHAR303 (3) Principles of Toxicology

- PLNT361 (3) Pest Management and the Environment (M)
- PLNT434 (3) Weed Biology and Control (M)
- SOIL315 (3) Soil Fertility and Fertilizer Use (M)
- SOIL410 (3) Soil Chemistry (M)
- SOIL521 (3) Soil Microbiology and Biochemistry (M)
- WILD401 (4) Fisheries and Wildlife Management (M)

6 credits in Social Sciences/Humanities:

- AGEC200 (3) Principles of Microeconomics (M)
or ECON208 (3) Microeconomic Analysis and Applications
- AGEC320 (3) Economics of Agricultural Production (M)
- AGEC333 (3) Resource Economics (M)
or ECON405 (3) Natural Resource Economics
- AGEC430 (3) Agriculture, Food and Resource Policy (M)
- AGEC442 (3) Economics of International Agricultural Development (M)
- ANTH418 (3) Environment and Development
- ECON225 (3) Economics of the Environment
- ENVR465 (3) Environment and Social Change (at Bay of Fundy)
- GEOG404 (3) Environmental Management 2 (in Panama)
- GEOG410 (3) Geography of Underdevelopment: Current Problems
- GEOG498 (3) Humans in Tropical Environments (in Panama)
- GEOG510 (3) Humid Tropical Environments
- SOCI254 (3) Development and Underdevelopment
- SOCI565 (3) Social Change in Panama (in Panama)
- WILD415 (2) Conservation Law (M)

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 (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.

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

The program introduces students to the interacting physical and 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.

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)

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 Course (3 credits)

GEOG203	(3)	Environmental Systems
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Domain: Complementary Courses (39 credits)

3 credits of statistics chosen from:

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

3 credits of ecology chosen from:

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

3 credits of weather and climate chosen from:

ATOC215	(3)	Oceans, Weather and Climate
NRSC201	(3)	Introductory Meteorology (M)

9 credits of fundamental land surface processes chosen from:

GEOG272	(3)	Earth's Changing Surface
or SOIL200	(3)	Introduction to Earth Science (M)
GEOG305	(3)	Soils and Environment
or SOIL326	(3)	Soil Genesis and Classification (M)
GEOG321	(3)	Climatic Environments
GEOG322	(3)	Environmental Hydrology
or BREE217	(3)	Hydrology and Water Resources (M)

3 credits of environment and resource management chosen from:

AGRI435	(3)	Soil and Water Quality Management (M)
AGRI550	(3)	Sustained Tropical Agriculture (in Panama)
BIOL465	(3)	Conservation Biology
CHEE230	(3)	Environmental Aspects of Technology
CIVE225	(4)	Environmental Engineering
GEOG302	(3)	Environmental Management 1
GEOG404	(3)	Environmental Management 2 (in Panama)
NRSC437	(3)	Assessing Environmental Impact (M)
WOOD420	(3)	Environmental Issues: Forestry (M)
WOOD441	(3)	Integrated Forest Management (M)

3 credits of a field course chosen from:

BIOL553	(3)	Neotropical Environments (in Panama)
GEOG495	(3)	Field Studies - Physical Geography (at Mont St. Hilaire)
GEOG496	(3)	Geographical Excursion (in Barbados)
GEOG497	(3)	Ecology of Coastal Waters (at Bay of Fundy)
GEOG499	(3)	Subarctic Field Studies (in Schefferville)
NRSC382	(3)	Ecological Monitoring and Analysis (M)
WILD475	(3)	Desert Ecology (in Arizona)

3 credits of social science issues chosen from:

ANTH339	(3)	Ecological Anthropology
ECON225	(3)	Economics of the Environment
ECON326	(3)	Ecological Economics
ECON405	(3)	Natural Resource Economics
or AGE333	(3)	Resource Economics (M)

ENVR465	(3)	Environment and Social Change (at Bay of Fundy)
GEOG408	(3)	Geography of Development
GEOG498	(3)	Humans in Tropical Environments (in Panama)
GEOG508	(3)	Resources, People and Power
SOCI565	(3)	Social Change in Panama (in Panama)

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

3 credits minimum of advanced study of particular environments:

BIOL358	(3)	Canadian Flora
or PLNT358	(3)	Flowering Plant Diversity (M)
BIOL432	(3)	Limnology
or NRSC315	(3)	Science of Inland Waters (M)
GEOG350	(3)	Ecological Biogeography
GEOG372	(3)	Running Water Environments
GEOG536	(3)	Geocryology
GEOG550	(3)	Quaternary Paleocology
PLNT460	(3)	Plant Ecology (M)
WOOD410	(3)	The Forest Ecosystem (M)

6 credits minimum of advanced study of surface processes:

BREE509	(2)	Hydrologic Systems and Modelling (M)
ATOC315	(3)	Water in the Atmosphere
EPSC549	(3)	Hydrogeology
EPSC580	(3)	Aqueous Geochemistry
GEOG501	(3)	Modelling Environmental Systems
GEOG505	(3)	Global Biogeochemistry
GEOG522	(3)	Advanced Environmental Hydrology
GEOG537	(3)	Advanced Fluvial Geomorphology
NRSC333	(3)	Physical and Biological Aspects of Pollution (M)
SOIL331	(3)	Soil Physics (M)
SOIL410	(3)	Soil Chemistry (M)

14.6.6 Renewable Resource Management Domain

[Program revisions are under consideration for the academic year 2005-06. Visit the MSE Website or go to 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.

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

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

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

Courses offered at Macdonald Campus are marked with an (M). (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) GIS for Bioresource Management (M)
or GEOG201 (3) Introductory Geo-Information Science
- AEMA310 (3) Statistical Methods 1 (M)
or BIOL373 (3) Biometry

6 credits advanced ecosystem components

- PLNT358 (3) Flowering Plant Diversity (M)
or BIOL358 (3) Canadian Flora
- BIOL553 (3) Neotropical Environments (in Panama)
- SOIL326 (3) Soil Genesis and Classification (M)
- WILD307 (3) Natural History of Vertebrates (M)

6 credits advanced ecological processes

- BREE217 (3) Hydrology and Water Resources (M)
or GEOG322 (3) Environmental Hydrology
- BIOL432 (3) Limnology
or NRSC315 (3) Science of Inland Waters (M)
- BIOL465 (3) Conservation Biology
- GEOG372 (3) Running Water Environments
- GEOG497 (3) Ecology of Coastal Waters (at Bay of Fundy)
- MICR331 (3) Microbial Ecology (M)
- PLNT460 (3) Plant Ecology (M)
- WILD410 (3) Wildlife Ecology (M)
- WOOD410 (3) The Forest Ecosystem (M)

6 credits social processes:

- AGEC242 (3) Management Theories and Practices (M)
- AGEC333 (3) Resource Economics (M)
or ECON405 (3) Natural Resource Economics
- ANTH339 (3) Ecological Anthropology
- CANS407 (3) Regions of Canada (at Bay of Fundy)

- ENVR465 (3) Environment and Social Change (at Bay of Fundy)
- GEOG498 (3) Humans in Tropical Environments (in Panama)
- RELG270 (3) Religious Ethics and the Environment
- SOCI565 (3) Social Change in Panama (in Panama)
- WILD415 (2) Conservation Law (M)

9 credits ecosystem components or management of ecosystems:

- AGRI435 (3) Soil and Water Quality Management (M)
- AGRI550 (3) Sustained Tropical Agriculture (in Panama)
- GEOG302 (3) Environmental Management 1
- GEOG404 (3) Environmental Management 2 (in Panama)
- NRSC437 (3) Assessing Environmental Impact (M)
- PLNT300 (3) Cropping Systems (M)
- SOIL335 (3) Soil Ecology and Management (M)
- WILD401 (4) Fisheries and Wildlife Management (M)
- WOOD441 (3) Integrated Forest Management (M)

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.

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

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

- 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 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) Ecological Economics
 ENVR465 (3) Environment and Social Change (at Bay of Fundy)
 GEOG404 (3) Environmental Management 1 (in Panama)
 GEOG498 (3) Humans in Tropical Environments (in Panama)
 POLI345 (3) International Organization
 POLI466 (3) Public Policy Analysis
 SOCI565 (3) Social Change in Panama (in Panama)

18 credits, minimum, from lists A and B below

List A, 9 to 12 credits chosen from:

AGRI435 (3) Soil and Water Quality Management (*M*)
 BIOL432 (3) Limnology
 BIOL441 (3) Biological Oceanography
 BIOL442 (3) Marine Biology
 BIOL465 (3) Conservation Biology
 BIOL553 (3) Neotropical Environments (in Panama)
 BIOL570 (3) Advanced Seminar in Evolution
 ENTO535 (3) Aquatic Entomology (*M*)
 ENVR540 or (3) Ecology of Species Invasions
 BIOL540
 GEOG305 (3) Soils and Environment
 or SOIL210 (3) Principles of Soil Science (*M*)
 GEOG350 (3) Ecological Biogeography
 MICR331 (3) Microbial Ecology (*M*)
 NRSC315 (3) Science of Inland Waters (*M*)
 NRSC333 (3) Physical and Biological Aspects of Pollution (*M*)
 PARA410 (3) Environment and Infection (*M*)
 WILD401 (4) Fisheries and Wildlife Management (*M*)

List B, 6 to 10 credits chosen from:

BREE430 (3) GIS for Bioresource Management (*M*)
 ATOC308 (3) Principles of Remote Sensing
 or GEOG308 (3) Principles of Remote Sensing

ATOC219 (3) Introduction to Atmospheric Chemistry
 or CHEM219 (3) Introduction to Atmospheric Chemistry
 ATOC419 (3) Advances in Chemistry of Atmosphere
 or CHEM419 (3) Advances in Chemistry of Atmosphere
 CHEM257D1 (2) Introductory Analytical Chemistry
 CHEM257D2 (2) Introductory Analytical Chemistry
 EPSC220 (3) Principles of Geochemistry
 GEOG201 (3) Introductory Geo-Information Science
 GEOG372 (3) Running Water Environments
 GEOG522 (3) Advanced Environmental Hydrology
 GEOG537 (3) Advanced Fluvial Geomorphology
 GEOG550 (3) Quaternary Paleoecology

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

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

Recommended Corequisite Course for Domain

MATH222 (3) Calculus 3
 or CEGEP Mathematics 201-301 or equivalent

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

Core: Required Courses (18 credits)

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 (9 credits)

ATOC215 (3) Oceans, Weather and Climate
 ATOC315 (3) Water in the Atmosphere
 GEOG372 (3) Running Water Environments

Domain – Complementary Courses (30 credits)

6 credits chosen from:

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

3 credits of statistics or calculus:

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

MATH222 (3) Calculus 3

12 credits chosen from:

- BREE430 (3) GIS for Bioresource Management (*M*)
- or GEOG306 (3) Raster Geo-Information Science
- BREE416 (3) Engineering for Land Development (*M*)
- BREE506 (3) Advances in Drainage Management (*M*)
- or BREE509 (3) Hydrologic Systems and Modelling (*M*)
- or GEOG522 (3) Advanced Environmental Hydrology
- AEMA205 (3) Differential Equations (*M*)
- or MATH315 (3) Ordinary Differential Equations
- AEPH510 (3) Agricultural Micrometeorology (*M*)
- AGRI435 (3) Soil and Water Quality Management (*M*)
- ATOC308 (3) Principles of Remote Sensing
- or GEOG308 (3) Principles of Remote Sensing
- ATOC309 (3) Weather Radars and Satellites
- ATOC568 (3) Ocean Physics
- CIVE323 (3) Hydrology and Water Resources
- EPSC549 (3) Hydrogeology
- GEOG201 (3) Introductory Geo-Information Science
- GEOG537 (3) Advanced Fluvial Geomorphology
- GEOG305 (3) Soils and Environment
- or SOIL210 (3) Principles of Soil Science (*M*)

3 credits of field courses

- GEOG 495 (3) Field Studies - Physical Geography (at Mont St. Hilaire)
- GEOG 497 (3) Ecology of Coastal Waters (at Bay of Fundy) or an equivalent aquatic field course

6 credits chosen from:

- BIOL432 (3) Limnology
- or BIOL441 (3) Biological Oceanography
- or NRSC315 (3) Science of Inland Waters (*M*)
- BIOL442 (3) Marine Biology
- BIOL465 (3) Conservation Biology
- BIOL553 (3) Neotropical Environments (in Panama)
- GEOG350 (3) Ecological Biogeography
- GEOG505 (3) Global Biogeochemistry
- WILD401 (4) Fisheries and Wildlife Management (*M*)

14.7 Major in Environment – B.Sc.

In addition to the selection of Domains available to students in the Major program in either the Faculty of Science or the Faculty of Agricultural and Environmental Sciences, "Major in Environment - B", students in the Faculty of Science program can choose from one of the two Domains limited to Science students only:

Atmospheric Environment and Air Quality, or
Earth Sciences and Economics.

Refer to Major in Environment - B for the general guidelines and regulations which apply to all Domains in the Major in Environment program.

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 (Course Calendars) in July for details.

14.7.1 Atmospheric Environment and Air Quality Domain

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

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

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The rapid expansion of industrialization has been accompanied with a host of environmental problems, many, if not most, involving 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.

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

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

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

Core: Required Courses (18 credits)

- 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 (18 credits)

- ATOC214 (3) Introduction: Physics of the Atmosphere
- ATOC215 (3) Oceans, Weather and Climate
- ATOC219 (3) Introduction to Atmospheric Chemistry
- or CHEM219 (3) Introduction to Atmospheric Chemistry
- ATOC308 (3) Principles of Remote Sensing
- or GEOG308 (3) Principles of Remote Sensing
- ATOC315 (3) Water in the Atmosphere
- CHEM307 (3) Analytical Chemistry of Pollutants

Domain: Complementary Courses (21 credits)

6 credits from:

- CHEM257D1 (2) Introductory Analytical Chemistry
- CHEM257D2 (2) Introductory Analytical Chemistry
- or FDSC213 (3) Analytical Chemistry 1 (*M*)
- MATH222 (3) Calculus 3
- or AEMA202 (3) Intermediate Calculus (*M*)

3 credits from:

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

9 credits of math or physical science (at least 6 credits of which are at the 300 level or above):

- ATOC309 (3) Weather Radars and Satellites
- ATOC412 (3) Atmospheric Dynamics
- ATOC419 (3) Advances in Chemistry of Atmosphere
- orCHEM419 (3) Advances in Chemistry of Atmosphere
- ATOC540 (3) Synoptic Meteorology 1
- CHEE230 (3) Environmental Aspects of Technology
- CHEM273 (1) Chemical Kinetics

CHEM377	(3)	Instrumental Analysis 2
CIVE225	(4)	Environmental Engineering
COMP208	(3)	Computers in Engineering
GEOG505	(3)	Global Biogeochemistry
MATH223	(3)	Linear Algebra
MATH315	(3)	Ordinary Differential Equations
or AEMA205	(4)	Differential Equations (<i>M</i>)
NRSC333	(3)	Physical and Biological Aspects of Pollution (<i>M</i>)
NRSC510	(3)	Agricultural Micrometeorology (<i>M</i>)

3 credits of social science:

ANTH206	(3)	Environment and Culture
ANTH418	(3)	Environment and Development
CMPL580	(3)	Environment and the Law
ECON225	(3)	Economics of the Environment
ECON347	(3)	Economics of Climate Change
ENVR465	(3)	Environment and Social Change (in Bay of Fundy)
GEOG302	(3)	Environmental Management 1
GEOG404	(3)	Environmental Management 2 (in Panama or in Africa)
GEOG498	(3)	Humans in Tropical Environments (in Panama)
POLI466	(3)	Public Policy Analysis
RELG270	(3)	Religious Ethics and the Environment

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 (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.

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

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

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

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

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

Core: Required Courses (18 credits)

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 (22 credits)

ECON230D1	(3)	Microeconomic Theory
ECON230D2	(3)	Microeconomic Theory
ECON405	(3)	Natural Resource Economics
EPSC210	(3)	Introductory Mineralogy
EPSC212	(4)	Introductory Petrology
EPSC220	(3)	Principles of Geochemistry
EPSC425	(3)	Sediments to Sequences

Domain: Complementary Courses (23 credits)

3 credits of statistics from:

AEMA310	(3)	Statistical Methods 1 (<i>M</i>)
or GEOG202	(3)	Statistics and Spatial Analysis
or MATH203	(3)	Principles of Statistics 1

12 credits from List A:

AGEC333	(3)	Resource Economics (<i>M</i>)
BIOL308	(3)	Ecological Dynamics
or WILD205	(3)	Principles of Ecology (<i>M</i>)
CHEE430	(3)	Technology Impact Assessment
or NRSC437	(3)	Assessing Environmental Impact (<i>M</i>)
ECON326	(3)	Ecological Economics
ECON347	(3)	Economics of Climate Change
ECON416	(3)	Topics in Economic Development 2
ECON525	(3)	Project Analysis

8 credits, minimum, from List B:

AGRI435	(3)	Soil and Water Quality Management (<i>M</i>)
ANTH339	(3)	Ecological Anthropology
BIOL305	(3)	Animal Diversity
BIOL553	(3)	Neotropical Environments (in Panama)
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
EPSC483D1	(1.5)	Independent Studies 2
EPSC483D2	(1.5)	Independent Studies 2
EPSC519	(3)	Isotope Geology
EPSC542	(3)	Chemical Oceanography
EPSC549	(3)	Hydrogeology
EPSC580	(3)	Aqueous Geochemistry
EPSC590	(3)	Applied Geochemistry Seminar
GEOG302	(3)	Environmental Management 1
GEOG322	(3)	Environmental Hydrology
GEOG497	(3)	Ecology of Coastal Waters (at Bay of Fundy)
SOIL410	(3)	Soil Chemistry (<i>M</i>)

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 studies at McGill; it may be started in either January or September. The Diploma is a one-year program if taken full-time.

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

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

DIPLOMA IN ENVIRONMENT (30 credits)

Required Courses (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

Complementary Courses (12 credits)

3 credits must be taken with the approval of the program adviser in an area outside of the student's previous degree (e.g., those with a B.A. or equivalent degree must take 3 credits in the natural sciences; those with a B.Sc. or equivalent degree must take 3 credits in the social sciences). A list of suggested courses is available from the program adviser, and on the MSE website in "Undergraduate Programs: Diploma".

9 credits must be taken in an area of focus chosen by the student with the approval of the program adviser. At least 6 credits must be taken at the 400 level or higher.

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.

14.9 Field Studies

14.9.1 African Field Study Semester

The Department of Geography, Faculty of Science, coordinates the 15-credit interdisciplinary [African Field Study Semester](#), see [section 15.1.1](#).

14.9.2 Barbados Field Study Semester

The Department of Bioresource Engineering, Faculty of Agricultural and Environmental Sciences, coordinates the 15-credit interdisciplinary Barbados Field Study Semester. For more information, see [section 15.1.2 "Barbados Field Study Semester"](#).

14.9.3 Panama Field Study Semester

McGill's School of Environment coordinates the 15-credit interdisciplinary Panama Field Study Semester. For information, see [section 15.1.3 "Panama Field Study Semester"](#).