# McGill School of Environment

# Programs, Courses and University Regulations

# 2010-2011

## Publication Information

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*Enrolment Services*

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# 1 About the McGill School of Environment

McGill's Faculties of Agricultural and Environmental Sciences, Arts, Science, and Law 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.

# 2 Mission of the School

The mission of the McGill School of Environment is:

- to provide a program that will develop a broad-based environmental literacy in the undergraduate population;
- to develop opportunities for graduate students to pursue studies of the environment at an advanced level to create future leaders and researchers; and
- to generate new ideas, new insights, new technologies, and new approaches to understanding and redressing environmental problems through academic research and outreach that draws on the University's existing strength in research and spans disciplinary boundaries.

# 3 About the School (Undergraduate)

The people and the programs of the McGill School of Environment are described in the following sections.

## 3.1 Location

For advising, contact:

Program Advisor, Ms. Kathy Roulet
Telephone: 514-398-4306
Fax: 514-398-1643
Email: *kathy.roulet@mcgill.ca*

Website: *www.mcgill.ca/mse*

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

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

## 3.2 Administrative Officers

| | |
|---|---|
| Chandra Madramootoo; B.Sc.(Agr.Eng.), M.Sc., Ph.D.(McG.) | **Dean, Faculty of Agricultural and Environmental Sciences** |
| Christopher Manfredi; B.A.(Calg.), M.A., Ph.D.(Claremont) | **Dean, Faculty of Arts** |
| Martin Grant; B.Sc.(PEI), M.Sc., Ph.D.(Tor.) | **Dean, Faculty of Science** |
| Marilyn Scott; B.Sc.(New Br.), Ph.D.(McG.) | **Director** |
| Madhav Badami; B.Tech., M.Sc.(IIT), M.E.Des.(Calg.), Ph.D.(Br. Col.) | **Associate Director, Graduate Affairs** |
| George McCourt; B.Sc., M.Sc.(Alta.), M.Sc.(McG.) | **Associate Director, Undergraduate Affairs** |
| Anthony Ricciardi; B.Sc.(Agr.), M.Sc., Ph.D.(McG.) | **Associate Director, Research** |
| Kathryn Roulet; B.Sc.(Trent), M.Sc.(Guelph) | **Program Advisor** |

## 3.3 Academic Staff

**Professors**

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

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

**Associate Professors**

Madhav Badami; B.Tech., M.Sc.(IIT), 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*)

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

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

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

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

**Assistant Professors**

Elena Bennett; B.A.(Oberlin), M.Sc., Ph.D.(Wis.) (*joint appoint. with Natural Resource Sciences*)

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

Iwao Hirose; Ph.D.(St. And.) (*joint appoint. with Philosophy*)

Brian Leung; B.Sc.(Br. Col.), Ph.D.(Car.) (*joint appoint. with Biology*)

Jeanine Rhemtulla; B.Sc.(McG.), M.Sc.(Alta.), Ph.D.(Wis.)

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

Ismael Vaccaro; B.A.(Barcelona), D.E.A.(Paris), M.A., Ph.D.(Wash.) (*joint appoint. with Anthropology*)

**Faculty Lecturers**

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

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

Kathryn Roulet; B.Sc.(Trent), M.Sc.(Guelph)

**Associate Members**

Animal Science: Sarah Kimmins

Anthropology: Andre Costopoulos, John Galaty

Atmospheric and Oceanic Sciences: Parisa Ariya

**Associate Members**

Biology: Lauren Chapman, Andrew Gonzalez, Irene Gregory-Eaves, Martin Lechowicz, Catherine Potvin, Michel Loreau

Bioresource Engineering: Jan Adamowski, Suzelle Barrington, Grant Clark, Robert Kok, Chandra Madramootoo

Chemical Engineering: Nathalie Tufenkji, Viviane Yargeau

Civil Engineering and Applied Mechanics: Susan Gaskin, Van-Thanh-Van Nguyen, Jim Nicell

Dietetics and Human Nutrition, School of: Tim Johns

Earth and Planetary Sciences: Jeanne Paquette

Economics: Robert Cairns, Chris Green, Tom Naylor

Electrical and Computer Engineering: Geza Joos

Epidemiology and Biostatistics: Mark Goldber

## 4.2 Degree Requirements

To be eligible for a B.A. degree, you must fulfil all the faculty and program requirements as indicated in *Faculty of Arts > Faculty of Arts Degrees*.

To be eligible for a B.A. & Sc. degree, you must fulfil all the faculty and program requirements as indicated in *Bachelor of Arts and Science > Degree Requirements*.

To be eligible for a B.Sc.(Ag.Env.Sc.) degree, you must fulfil all the faculty and program requirements as indicated in *Faculty of Agricultural and Environmental Sciences*

These regulations are **not identical**:

- Arts students, see *Faculty of Arts > Courses Outside the Faculties of Arts and Science*.
- Arts and Science students, see *Bachelor of Arts and Science > Courses Outside the Faculties of Arts and Science*.
- Science students, see *Faculty of Science > Courses Outside the Faculties of Arts and Science*.
- Agricultural and Environmental Sciences students, see *Faculty of Agricultural and Environmental Sciences > Minimum Credit Requirement*.
- Faculty of Science students F1 8.1 Tf1 0 0 1 81.e004

- submit their program of courses already taken and to be taken for the Minor in Environment to the MSE Program Advisor for approval **(only courses at the 200-level and above will be approved)**;
- pass all courses counted towards the Minor with **a grade of C or higher**;
- complete 18 credits from the courses listed under *section 7.1: Bachelor of Arts (B.A.) - Minor Concentration Environment (18 credits)* or *section 7.2: Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Minor Environment (18 credits)* in this publication and which are not otherwise counted towards the student's Major program or concentration or a second Minor program; and
- ensure that all 18 credits are taken outside the discipline or field of the student's Major program or concentration.

## 7.1 Bachelor of Arts (B.A.) - Minor Concentration Environment (18 credits)

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

### Advising Note:

Consultation with the Program Advisor for approval of course selection to meet program requirements is obligatory. Only courses at the 200-level and above will be approved.

For more information please contact:

Ms. Kathy Roulet, MSE Program Advisor

E-mail: (kathy.roulet@mcgill.ca)

Telephone: 514-398-4306

### Complementary Courses (18 credits)

18 credits of Complementary Courses are selected as follows:

12 credits of MSE core courses:

Location Note: Core courses are taught at both McGill's downtown campus and at the Macdonald campus in Ste.

| | | |
|---|---|---|
| AGEC 430 | (3) | Agriculture, Food and Resource Policy |
| AGEC 442 | (3) | Economics of International Agricultural Development |
| AGRI 210 | (3) | Agro-Ecological History |
| AGRI 411 | (3) | Global Issues on Development, Food and Agriculture |
| ANTH 206 | (3) | Environment and Culture |
| ANTH 212 | (3) | Anthropology of Development |
| ANTH 339 | (3) | Ecological Anthropology |
| ANTH 512 | (3) | Political Ecology |
| CIVE 433 | (3) | Urban Planning |
| ECON 205 | (3) | An Introduction to Political Economy |
| ECON 225 | (3) | Economics of the Environment |
| ECON 326 | (3) | Ecological Economics |
| ECON 347 | (3) | Economics of Climate Change |
| ECON 405 | (3) | Natural Resource Economics |
| ENVR 201 | (3) | Society and Environment |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 400 | (3) | Environmental Thought |
| GEOG 200 | (3) | Geographical Perspectives: World Environmental Problems |
| GEOG 210 | (3) | Global Places and Peoples |
| GEOG 216 | (3) | Geography of the World Economy |
| GEOG 221 | (3) | Environment and Health |
| GEOG 300 | (3) | Human Ecology in Geography |

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GeOG 300

Geograph1.949ot013aj1 0 0 1 287.1 93)

| | | |
|---|---|---|
| POLI 211 | (3) | Comparative Government and Politics |
| POLI 212 | (3) | Government and Politics - Developed World |
| POLI 227 | (3) | Developing Areas/Introduction |
| POLI 345 | (3) | International Organizations |
| POLI 445 | (3) | International Political Economy: Monetary Relations |
| POLI 466 | (3) | Public Policy Analysis |
| PSYC 215 | (3) | Social Psychology |
| RELG 270 | (3) | Religious Ethics and the Environment |
| RELG 340 | (3) | Religion and the Sciences |
| RELG 370 | (3) | Religion and Human Rights |
| RELG 376 | (3) | Religious Ethics |
| SOCI 222 | (3) | Urban Sociology |
| SOCI 234 | (3) | Population and Society |
| SOCI 235 | (3) | Technology and Society |
| SOCI 254 | (3) | Development and Underdevelopment |
| SOCI 386 | (3) | Contemporary Social Movements |
| URBP 201 | (3) | Planning the 21st Century City |
| URBP 506 | (3) | Environmental Policy and Planning |
| URBP 530 | (3) | Urban Environmental Planning |
| WILD 415* | (2) | Conservation Law |

### Natural Sciences and Technology

** Note: you may take MIMM 211 or LSCI 230 but not both; you may take ENVB 315 or BIOL 432 but not both.

| | | |
|---|---|---|
| AGRI 340 | (3) | Principles of Ecological Agriculture |
| AGRI 435 | (3) | Soil and Water Quality Management |
| ANSC 326 | (3) | Fundamentals of Population Genetics |
| ANTH 311 | (3) | Primate Behaviour and Ecology |
| ARCH 375 | (2) | Landscape |
| ARCH 377 | (3) | Energy, Environment and Buildings |
| ARCH 378 | (3) | Site Usage |
| ATOC 215 | (3) | Oceans, Weather and Climate |
| BIOL 240 | (3) | Monteregian Flora |
| BIOL 305 | (3) | Animal Diversity |
| BIOL 308 | (3) | Ecological Dynamics |
| BIOL 310 | (3) | Biodiversity and Ecosystems |
| BIOL 342 | (3) | Marine Biology |
| BIOL 418 | (3) | Freshwater Invertebrate Ecology |
| BIOL 432** | (3) | Limnology |
| BIOL 436 | (3) | Evolution and Society |
| BIOL 465 | (3) | Conservation Biology |

| | | |
|---|---|---|
| BTEC 502 | (3) | Biotechnology Ethics and Society |
| CHEE 230 | (3) | Environmental Aspects of Technology |
| CHEE 430 | (3) | Technology Impact Assessment |
| CHEM 212 | (4) | Introductory Organic Chemistry 1 |
| CHEM 281 | (3) | Inorganic Chemistry 1 |
| CHEM 462 | (3) | Green Chemistry |
| CIVE 225 | (4) | Environmental Engineering |
| CIVE 323 | (3) | Hydrology and Water Resources |
| CIVE 550 | (3) | Water Resources Management |
| ENTO 340 | (3) | Field Entomology |
| ENVB 210 | (3) | The Biophysical Environment |
| ENVB 301 | (3) | Meteorology |
| ENVB 305 | (3) | Population & Community Ecology |
| ENVB 315** | (3) | Science of Inland Waters |
| ENVB 410 | (3) | Ecosystem Ecology |
| ENVB 415 | (3) | Ecosystem Management |
| ENVR 200 | (3) | The Global Environment |
| ENVR 202 | (3) | The Evolving Earth |
| EPSC 201 | (3) | Understanding Planet Earth |
| EPSC 233 | (3) | Earth and Life History |
| EPSC 425 | (3) | Sediments to Sequences |
| EPSC 549 | (3) | Hydrogeology |
| ESYS 301 | (3) | Earth System Modelling |
| GEOG 200 | (3) | Geographical Perspectives: World Environmental Problems |
| GEOG 201 | (3) | Introductory Geo-Information Science |
| GEOG 205 | (3) | Global Change: Past, Present and Future |
| GEOG 272 | (3) | Earth's Changing Surface |
| GEOG 308 | (3) | Principles of Remote Sensing |
| GEOG 321 | (3) | Climatic Environments |
| GEOG 322 | (3) | Environmental Hydrology |
| GEOG 372 | (3) | Running Water Environments |
| GEOG 470 | (3) | Wetlands |
| LSCI 230** | (3) | Introductory Microbiology |
| MICR 331 | (3) | Microbial Ecology |
| MIME 308 | (3) | Social Impact of Technology |
| MIME 320 | (3) | Extraction of Energy Resources |
| MIMM 211** | (3) | Introductory Microbiology |
| MIMM 314 | (3) | Immunology |
| MIMM 323 | (3) | Microbial Physiology |
| MIMM 324 | (3) | Fundamental Virology |
| NRSC 333 | (3) | Pollution and Bioremediation |
| NRSC 340 | (3) | Global Perspectives on Food |
| NRSC 384 | (3) | Field Research Project |

Most courses listed at the 300-level and higher have prerequisites. You are urged to prepare your program of study with this in mind.

This list is not meant to be exhaustive. You are also encouraged to examine the course lists of the various Domains in the Environment program for other courses that might interest you. Courses not on the Suggested Courses list may be included in the Minor with the permission of the MSE Program Advisor.

**Location Note:**

When planning your schedule and registering for courses, you should verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue.

**Social Sciences and Policy**

* Note: If WILD 415 is taken, 1 additional credit of complementary courses must be taken.

| | | |
|---|---|---|
| AGEC 231 | (3) | Economic Systems of Agriculture |
| AGEC 333 | (3) | Resource Economics |
| AGEC 430 | (3) | Agriculture, Food and Resource Policy |
| AGEC 442 | (3) | Economics of International Agricultural Development |
| AGRI 210 | (3) | Agro-Ecological History |
| AGRI 411 | (3) | Global Issues on Development, Food and Agriculture |
| ANTH 206 | (3) | Environment and Culture |
| ANTH 212 | (3) | Anthropology of Development |
| ANTH 339 | (3) | Ecological Anthropology |
| ANTH 512 | (3) | Political Ecology |
| CIVE 433 | (3) | Urban Planning |
| ECON 205 | (3) | An Introduction to Political Economy |
| ECON 225 | (3) | Economics of the Environment |
| ECON 326 | (3) | Ecological Economics |
| ECON 347 | (3) | Economics of Climate Change |
| ECON 405 | (3) | Natural Resource Economics |
| ENVR 201 | (3) | Society and Environment |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 400 | (3) | Environmental Thought |
| GEOG 200 | (3) | Geographical Perspectives: World Environmental Problems |
| GEOG 210 | (3) | Global Places and Peoples |
| GEOG 216 | (3) | Geography of the World Economy |
| GEOG 221 | (3) | Environment and Health |
| GEOG 300 | (3) | Human Ecology in Geography |
| GEOG 301 | (3) | Geography of Nunavut |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 303 | (3) | Health Geography |
| GEOG 370 | (3) | Protected Areas |
| GEOG 382 | (3) | Principles Earth Citizenship |
| GEOG 403 | (3) | Global Health and Environmental Change |
| GEOG 408 | (3) | Geography of Development |
| GEOG 410 | (3) | Geography of Underdevelopment: Current Problems |
| GEOG 508 | (3) | Resources, People and Power |
| GEOG 530 | (3) | Global Land and Water Resources |
| GEOG 551 | (3) | Environmental Decisions |

| | | |
|---|---|---|
| MGPO 440 | (3) | Strategies for Sustainability |
| NRSC 221 | (3) | Environment and Health |
| NRSC 437 | (3) | Assessing Environmental Impact |
| NRSC 512 | (3) | Water: Ethics, Law and Policy |
| NRSC 540 | (3) | Socio-Cultural Issues in Water |
| PHIL 230 | (3) | Introduction to Moral Philosophy 1 |
| PHIL 237 | (3) | Contemporary Moral Issues |
| PHIL 334 | (3) | Ethical Theory |
| PHIL 343 | (3) | Biomedical Ethics |
| PHIL 348 | (3) | Philosophy of Law 1 |
| POLI 211 | (3) | Comparative Government and Politics |
| POLI 212 | (3) | Government and Politics - Developed World |
| POLI 227 | (3) | Developing Areas/Introduction |
| POLI 345 | (3) | International Organizations |
| POLI 445 | (3) | International Political Economy: Monetary Relations |
| POLI 466 | (3) | Public Policy Analysis |
| PSYC 215 | (3) | Social Psychology |
| RELG 270 | (3) | Religious Ethics and the Environment |
| RELG 340 | (3) | Religion and the Sciences |
| RELG 370 | (3) | Religion and Human Rights |
| RELG 376 | (3) | Religious Ethics |
| SOCI 222 | (3) | Urban Sociology |
| SOCI 234 | (3) | Population and Society |
| SOCI 235 | (3) | Technology and Society |
| SOCI 254 | (3) | Development and Underdevelopment |
| SOCI 386 | (3) | Contemporary Social Movements |
| URBP 201 | (3) | Planning the 21st Century City |
| URBP 506 | (3) | Environmental Policy and Planning |
| URBP 530 | (3) | Urban Environmental Planning |
| WILD 415* | (2) | Conservation Law |

### Natural Sciences and Technology

*Note: you may take MIMM 211 or LSCI 230 but not both; you may take ENVB 315 or BIOL 432 but not both.

| | | |
|---|---|---|
| AGRI 340 | (3) | Principles of Ecological Agriculture |
| AGRI 435 | (3) | Soil and Water Quality Management |
| ANSC 326 | (3) | Fundamentals of Population Genetics |
| ANTH 311 | (3) | Primate Behaviour and Ecology |
| ARCH 375 | (2) | Landscape |
| ARCH 377 | (3) | Energy, Environment and Buildings |
| ARCH 378 | (3) | Site Usage |
| ATOC 215 | (3) | Oceans, Weather and Climate |
| BIOL 240 | (3) | Monteregian Flora |
| BIOL 305 | (3) | Animal Diversity |

| | | |
|---|---|---|
| BIOL 308 | (3) | Ecological Dynamics |
| BIOL 310 | (3) | Biodiversity and Ecosystems |
| BIOL 342 | (3) | Marine Biology |
| BIOL 418 | (3) | Freshwater Invertebrate Ecology |
| BIOL 432* | (3) | Limnology |
| BIOL 436 | (3) | Evolution and Society |
| BIOL 465 | (3) | Conservation Biology |
| BREE 217 | (3) | Hydrology and Water Resources |
| BREE 322 | (3) | Organic Waste Management |
| BREE 518 | (3) | Bio-Treatment of Wastes |
| BTEC 502 | (3) | Biotechnology Ethics and Society |
| CHEE 230 | (3) | Environmental Aspects of Technology |
| CHEE 430 | (3) | Technology Impact Assessment |
| CHEM 212 | (4) | Introductory Organic Chemistry 1 |
| CHEM 281 | (3) | Inorganic Chemistry 1 |
| CHEM 462 | (3) | Green Chemistry |
| CIVE 225 | (4) | Environmental Engineering |
| CIVE 323 | (3) | Hydrology and Water Resources |
| CIVE 550 | (3) | Water Resources Management |
| ENTO 340 | (3) | Field Entomology |
| ENVB 210 | (3) | The Biophysical Environment |
| ENVB 301 | (3) | Meteorology |
| ENVB 305 | (3) | Population & Community Ecology |
| ENVB 315* | (3) | Science of Inland Waters |
| ENVB 410 | (3) | Ecosystem Ecology |
| ENVB 415 | (3) | Ecosystem Management |
| ENVR 200 | (3) | The Global Environment |
| ENVR 202 | (3) | The Evolving Earth |
| EPSC 201 | (3) | Understanding Planet Earth |
| EPSC 233 | (3) | Earth and Life History |
| EPSC 425 | (3) | Sediments to Sequences |
| EPSC 549 | (3) | Hydrogeology |
| ESYS 301 | (3) | Earth System Modelling |
| | | Geographical Perspecti |

| | | |
|---|---|---|
| MICR 331 | (3) | Microbial Ecology |
| MIME 308 | (3) | Social Impact of Technology |
| MIME 320 | (3) | Extraction of Energy Resources |
| MIMM 211* | (3) | Introductory Microbiology |
| MIMM 314 | (3) | Immunology |
| MIMM 323 | (3) | Microbial Physiology |
| MIMM 324 | (3) | Fundamental Virology |
| NRSC 333 | (3) | Pollution and Bioremediation |
| NRSC 340 | (3) | Global Perspectives on Food |
| NRSC 384 | (3) | Field Research Project |

- confirm that their course selection satisfies the required components of the MSE Core and their chosen Domain, and that the complementary courses are approved courses in their chosen Domain; and
- fulfil all Faculty requirements as specified for the B.A. in the Arts, see *Faculty of Arts* > *Faculty of Arts Degree Requirements*, which include meeting the minimum credit requirement as specified in their letter of admission.

## 8.1 Ecological Determinants of Health in Society Domain

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

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306 | Professor Marilyn Scott<br>Email: *marilyn.scott@mcgill.ca*<br>Telephone: 514-398-7996 |

### 8.1.1 Bachelor of Arts (B.A.) - Faculty Program Environment - Ecological Determinants of Health in Society (54 credits)

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.

#### Program Prerequisites or Corequisites

All B.A. Environment students MUST take these pre- or corequisite courses, or their equivalents. These courses should be taken in the Freshman year if possible. Quebec students can take them in U1.

#### Calculus

3 credits of calculus from the following, or equivalent (e.g., CEGEP objective 00UN):

| | | |
|---|---|---|
| MATH 139 | (4) | Calculus 1 with Precalculus |
| MATH 140 | (3) | Calculus 1 |

#### Basic Science

3 credits of basic science from the following, or equivalent (e.g., CEGEP objective 00UK):

| | | |
|---|---|---|
| AEBI 120 | (3) | General Biology |
| BIOL 111 | (3) | Principles: Organismal Biology |

#### Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://wwwws the requrses to tak

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

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

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

**Complementary Courses (33 credits)**

33 credits of complementary courses are chosen as follows:

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

9 credits from List A

6 credits from List B

**Fundamentals:**

18 credits of Fundamentals (3 credits from each category):

**Health and Environment**

| | | |
|---|---|---|
| GEOG 221 | (3) | Environment and Health |
| NRSC 221 | (3) | Environment and Health |

**Health and Infection**

| | | |
|---|---|---|
| GEOG 403 | (3) | Global Health and Environmental Change |
| PARA 410 | (3) | Environment and Infection |

**Health and Pollution**

| | | |
|---|---|---|
| ANTH 227 | (3) | Medical Anthropology |
| NRSC 333 | (3) | Pollution and Bioremediation |

**Economics**

| | | |
|---|---|---|
| AGEC 200 | (3) | Principles of Microeconomics |
| ECON 208 | (3) | Microeconomic Analysis and Applications |

**Nutrition**

| | | |
|---|---|---|
| NUTR 200 | (3) | Contemporary Nutrition |
| NUTR 207 | (3) | Nutrition and Health |

**Statistics**

One of the following statistics courses or equivalent:

Note: Credit given for statistics courses is subject to certain restrictions. Students should consult the "Course Overlap" information in the "Course Requirements" section for the Faculty of Arts.

| | | |
|---|---|---|
| AEMA 310 | (3) | Statistical Methods 1 |
| MATH 203 | (3) | Principles of Statistics 1 |
| SOCI 350 | (3) | Statistics in Social Research |

**List A:**

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

**Health and Society**

| | | |
|---|---|---|
| GEOG 303 | (3) | Health Geography |
| SOCI 234 | (3) | Population and Society |
| SOCI 309 | (3) | Health and Illness |

**Hydrology and Climate**

| | | |
|---|---|---|
| BREE 217 | (3) | Hydrology and Water Resources |
| GEOG 321 | (3) | Climatic Environments |
| GEOG 322 | (3) | Environmental Hydrology |
| NRSC 510 | (3) | Agricultural Micrometeorology |

**Agriculture**

| | | |
|---|---|---|
| AGRI 210 | (3) | Agro-Ecological History |
| AGRI 340 | (3) | Principles of Ecological Agriculture |
| AGRI 411 | (3) | Global Issues on Development, Food and Agriculture |

**Decision Making**

| | | |
|---|---|---|
| AGEC 242 | (3) | Management Theories and Practices |
| BTEC 502 | (3) | Biotechnology Ethics and Society |
| ECON 440 | (3) | Health Economics |
| PHIL 343 | (3) | Biomedical Ethics |
| URBP 520 | (3) | Globalization: Planning and Change |

**Biology Fundamentals:**

| | | |
|---|---|---|
| AEBI 210 | (3) | Organisms 1 |
| AEBI 211 | (3) | Organisms 2 |
| BIOL 200 | (3) | Molecular Biology |
| BIOL 205 | (3) | Biology of Organisms |
| BIOL 308 | (3) | Ecological Dynamics |
| ENVB 305 | (3) | Population & Community Ecology |
| LSCI 211 | (3) | Biochemistry 1 |
| PHGY 202 | (3) | Human Physiology: Body Functions |

**Development and Ecology**

| | | |
|---|---|---|
| ANTH 212 | (3) | Anthropology of Development |
| ANTH 339 | (3) | Ecological Anthropology |
| GEOG 300 | (3) | Human Ecology in Geography |
| SOCI 254 | (3) | Development and Underdevelopment |

**List B:**

6 credits from List B (maximum 3 credits from an

| | | |
|---|---|---|
| PSYC 533 | (3) | International Health Psychology |
| SOCI 520 | (3) | Migration and Immigrant Groups |
| SOCI 550 | (3) | Developing Societies |
| SOCI 565 | (3) | Social Change in Panama |

## 8.2 Economics and the Earth's Environment Domain

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

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306 | Professor Jeanne Paquette<br>Email: *jeanne.paquette@mcgill.ca*<br>Telephone: 514-398-4402 |

### 8.2.1 Bachelor of Arts (B.A.) - Faculty Program Environment - Economics and the Earth's Environment (54 credits)

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 that 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 ho

Location Note: When planning your schedule and registering for courses, you should verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald campus in Ste. Anne de Bellevue.

### Core: Required Courses (18 credits)

Location Note: Core Required Courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue. You should register in Section 001 of an ENVR course that you plan to take on the downtown campus, and in Section 051 of an ENVR course that you plan to take on the Macdonald campus.

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

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

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

### Domain: Required Cour Ko (6)

### Advanced Courses

9 credits from:

*Note: If WILD 415 is taken, 1 additional credit of complementary courses must be taken.

| | | |
|---|---|---|
| AGRI 435 | (3) | Soil and Water Quality Management |
| AGRI 452 | (3) | Water Resources in Barbados |
| AGRI 550 | (3) | Sustained Tropical Agriculture |
| ANTH 339 | (3) | Ecological Anthropology |
| BIOL 305 | (3) | Animal Diversity |
| BIOL 308 | (3) | Ecological Dynamics |
| CHEE 430 | (3) | Technology Impact Assessment |
| ECON 305 | (3) | Industrial Organization |
| ECON 313 | (3) | Economic Development 1 |
| ECON 314 | (3) | Economic Development 2 |
| ECON 408 | (3) | Public Sector Economics 1 |

### Program Prerequisites or Corequisites

All B.A. Environment students must take these courses, or their equivalents. These courses should be taken in the Freshman year if possible. Quebec students can take them in U1.

### Calculus

3 credits of calculus from the following, or equivalent (e.g., CEGEP objective OOUN):

| | | |
|---|---|---|
| MATH 139 | (4) | Calculus 1 with Precalculus |
| MATH 140 | (3) | Calculus 1 |

### Basic Science

3 credits of basic science from the following, or equivalent (e.g., CEGEP objectives: Biology OOUK, Chemistry OOUL, Physics OOUR):

| | | |
|---|---|---|
| BIOL 111 | (3) | Principles: Organismal Biology |
| CHEM 110 | (4) | General Chemistry 1 |
| PHYS 101 | (4) | Introductory Physics - Mechanics |

### Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://www.mcgill.ca/mse), or contact Ms. Kathy Roulet, the Program Advisor (kathy.roulet@mcgill.ca).

### Program Requirements

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.

Location Note: When planning their schedule and registering for courses, students should verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue.

### Core: Required Courses (18 credits)

Location Note: Core required courses are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue. You should register in Section 001 of an ENVR course that you plan to take on the downtown campus, and in Section 051 of an ENVR course that you plan to take on the Macdonald campus.

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

### Core: Complementary Course - Senior Research PrENVR 301

| | | |
|---|---|---|
| GEOG 302 | (3) | Environmental Management 1 |

### Domain: Complementary Courses (21 credits)

21 credits of complementary courses are chosen from various domains as follows:

### Microeconomics

one of:

| | | |
|---|---|---|
| AGEC 200 | (3) | Principles of Microeconomics |
| ECON 208 | (3) | Microeconomic Analysis and Applications |

### Statistics

3 credits, one of the following statistics courses or equivalent:

Note: Credit given for statistics courses is subject to certain restrictions. Students should consult the "Course Overlap" information in the "Course Requirements" section for the Faculty of Arts.

| | | |
|---|---|---|
| AEMA 310 | (3) | Statistical Methods 1 |
| GEOG 202 | (3) | Statistics and Spatial Analysis |
| MATH 203 | (3) | Principles of Statistics 1 |
| PSYC 204 | (3) | Introduction to Psychological Statistics |

### Advanced Development Courses

6 credits from:

| | | |
|---|---|---|
| AGEC 442 | (3) | Economics of International Agricultural Development |
| ANTH 418 | (3) | Environment and Development |
| GEOG 408 | (3) | Geography of Development |
| GEOG 410 | (3) | Geography of Underdevelopment: Current Problems |

### Natural Sciences

3 credits from:

| | | |
|---|---|---|
| AGRI 550 | (3) | Sustained Tropical Agriculture |
| BIOL 308 | (3) | Ecological Dynamics |
| BIOL 465 | (3) | Conservation Biology |
| BIOL 553 | (3) | Neotropical Environments |

Population & Community 6.925 1s 22901n0 1 165.864 245.485 Tm(5 1s 22901nENVB1 70.52 261.205 Tm(BIOL : CrT

| | | |
|---|---|---|
| AGRI 210 | (3) | Agro-Ecological History |
| AGRI 452 | (3) | Water Resources in Barbados |
| ANTH 439 | (3) | Theories of Development |
| ANTH 445 | (3) | Property and Land Tenure |
| CANS 407 | (3) | Regions of Canada |
| ECON 326 | (3) | Ecological Economics |
| ECON 405 | (3) | Natural Resource Economics |
| GEOG 201 | (3) | Introductory Geo-Information Science |
| GEOG 300 | (3) | Human Ecology in Geography |
| GEOG 311 | (3) | Economic Geography |
| GEOG 331 | (3) | Urban Social Geography |
| GEOG 380 | (3) | Adaptive Environmental Management |
| GEOG 404 | (3) | Environmental Management 2 |
| GEOG 408 | (3) | Geography of Development |
| GEOG 416 | (3) | Africa South of the Sahara |
| GEOG 496 | (3) | Geographical Excursion |
| GEOG 498 | (3) | Humans in Tropical Environments |
| GEOG 508 | (3) | Resources, People and Power |
| GEOG 510 | (3) | Humid Tropical Environments |
| GEOG 551 | (3) | Environmental Decisions |
| MGPO 440 | (3) | Strategies for Sustainability |
| POLI 445 | (3) | International Political Economy: Monetary Relations |
| POLI 472 | (3) | Developing Areas/Social Movements |
| SOCI 565 | (3) | Social Change in Panama |
| URBP 507 | (3) | Planning and Infrastructure |
| URBP 520 | (3) | Globalization: Planning and Change |

## 9 Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Environment

The Interfaculty Program in Environment is open only to students in the B.A. & Sc. degree.

**Advisor**

Ms. Kathy Roulet, MSE Program Advisor
Email: *kathy.roulet@mcgill.ca*
Telephone: 514-398-4306

To obtain a B.A. & Sc. Interfaculty Program in Environment students must:

- register in the program online, using Minerva;
- satisfy the co- / prerequisites for the program;
- pass all courses counted tow satisfyc 0 0 1Tf11 0 0 1j/F0 8.1 Tf1 0 0 1(rm8.at8.1irs count se: cience the 0 1Tf11 0 0 1j/F0 8.1 Tf1 0 0 1(em8.1 tes frj1comp4-3t:)T

## 9.1 Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program Environment (54 credits)

The growth of technology, globalization of economies, and rapid increases in population and per capita consumption have all had dramatic environmental impacts. The Interfaculty Program Environment for the Bachelor of Arts and Science is designed to provide students with a broad "Liberal Arts/Science" training. In combination with careful mentoring, this program offers a great degree of flexibility, allowing students to develop the skills and knowledge base required to fa1.19as22 T 0 0 1The gro

**Areas:**

30 credits from at least 3 of the following Areas. At least 6 credits must be at the 400-level or higher, selected either from these lists or in consultation with the Program Advisor.

### Area 1: Population, Community and Ecosystem Ecology

* Note: you may take BIOL 540 or ENVR 540 but not both.

| | | |
|---|---|---|
| BIOL 308 | (3) | Ecological Dynamics |
| BIOL 432 | (3) | Limnology |
| BIOL 441 | (3) | Biological Oceanography |
| BIOL 540* | (3) | Ecology of Species Invasions |
| ENVB 305 | (3) | Population & Community Ecology |
| ENVB 410 | (3) | Ecosystem Ecology |
| ENVR 540* | (3) | Ecology of Species Invasions |
| GEOG 350 | (3) | Ecological Biogeography |
| PLNT 460 | (3) | Plant Ecology |
| WILD 410 | (3) | Wildlife Ecology |

### Area 2: Biodiversity and Conservation

| | | |
|---|---|---|
| BIOL 305 | (3) | Animal Diversity |
| BIOL 341 | (3) | History of Life |
| BIOL 355 | (3) | Trees: Ecology & Evolution |
| BIOL 427 | (3) | Herpetology |
| BIOL 465 | (3) | Conservation Biology |
| ENTO 440 | (3) | Insect Diversity |
| MICR 331 | (3) | Microbial Ecology |
| PLNT 358 | (3) | Flowering Plant Diversity |
| WILD 307 | (3) | Natural History of Vertebrates |
| WILD 350 | (3) | Mammalogy |
| WILD 420 | (3) | Ornithology |

### Area 3: Field studies in ecology and conservation

| | | |
|---|---|---|
| BIOL 240 | (3) | Monteregian Flora |

| | | |
|---|---|---|
| EPSC 549 | (3) | Hydrogeology |
| GEOG 322* | (3) | Environmental Hydrology |
| GEOG 372 | (3) | Running Water Environments |
| GEOG 522 | (3) | Advanced Environmental Hydrology |
| GEOG 537 | (3) | Advanced Fluvial Geomorphology |
| NRSC 540 | (3) | Socio-Cultural Issues in Water |

### Area 5: Human Health

* Note: you may take ANSC 330 or NUTR 307 but not both; you may take PHAR 303 or NUTR 420 but not both.

| | | |
|---|---|---|
| ANSC 330* | (3) | Fundamentals of Nutrition |
| NUTR 307* | (3) | Human Nutrition |
| NUTR 420* | (3) | Toxicology and Health Risks |
| PARA 410 | (3) | Environment and Infection |
| PATH 300 | (3) | Human Disease |
| PHAR 303* | (3) | Principles of Toxicology |

### Area 6: Earth and soil sciences

| | | |
|---|---|---|
| ATOC 215 | (3) | Oceans, Weather and Climate |
| EPSC 201 | (3) | Understanding Planet Earth |
| GEOG 272 | (3) | Earth's Changing Surface |
| GEOG 305 | (3) | Soils and Environment |
| GEOG 321 | (3) | Climatic Environments |
| SOIL 326 | (3) | Soils in a Changing Environment |

### Area 7: Economics

* Note: you may take AGEC 200 or ECON 208 but not both.

| | | |
|---|---|---|
| AGEC 200* | (3) | Principles of Microeconomics |
| AGEC 333 | (3) | Resource Economics |
| ECON 208* | (3) | Microeconomic Analysis and Applications |
| ECON 326 | (3) | Ecological Economics |
| ECON 347 | (3) | Economics of Climate Change |
| ECON 405 | (3) | Natural Resource Economics |
| GEOG 216 | (3) | Geography of the World Economy |

### Area 8: Development and Underdevelopment

| | | |
|---|---|---|
| ANTH 212 | (3) | Anthropology of Development |
| ANTH 418 | (3) | Environment and Development |

| | | |
|---|---|---|
| POLI 445 | (3) | International Political Economy: Monetary Relations |
| SWRK 374 | (3) | Community Development/Social Action |

**Area 9: Cultures and People**

| | | |
|---|---|---|
| ANTH 206 | (3) | Environment and Culture |
| ANTH 339 | (3) | Ecological Anthropology |
| GEOG 210 | (3) | Global Places and Peoples |

**Area 10: Human Ecology and Health**

| | | |
|---|---|---|
| ANTH 227 | (3) | Medical Anthropology |
| GEOG 300 | (3) | Human Ecology in Geography |
| GEOG 303 | (3) | Health Geography |
| PHIL 343 | (3) | Biomedical Ethics |
| SOCI 225 | (3) | Medicine and Health in Modern Society |
| SOCI 309 | (3) | Health and Illness |

**Area 11: Spirituality, Philosophy, Thought**

| | | |
|---|---|---|
| EDER 461 | (3) | Society and Change |
| PHIL 220 | (3) | Introduction to History and Philosophy of Science 1 |
| PHIL 221 | (3) | Introduction to History and Philosophy of Science 2 |
| PHIL 237 | (3) | Contemporary Moral Issues |
| PHIL 341 | (3) | Philosophy of Science 1 |
| PHIL 348 | (3) | Philosophy of Law 1 |
| RELG 270 | (3) | Religious Ethics and the Environment |
| RELG 340 | (3) | Religion and the Sciences |
| RELG 370 | (3) | Religion and Human Rights |

**Area 12: Environmental Management**

* Note: If WILD 415 is taken, 1 additional credit of complementary courses must be taken.

| | | |
|---|---|---|
| AGRI 210 | (3) | Agro-Ecological History |
| AGRI 435 | (3) | Soil and Water Quality Management |
| AGRI 452 | (3) | Water Resources in Barbados |
| ENTO 336 | (3) | Economic Entomology |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 380 | (3) | Adaptive Environmental Management |
| GEOG 404 | (3) | Environmental Management 2 |
| NRSC 333 | (3) | Pollution and Bioremediation |
| NRSC 382 | (3) | Ecological Monitoring and Analysis |
| NRSC 383 | (3) | Land Use: Redesign and Planning |
| NRSC 437 | (3) | Assessing Environmental Impact |
| SOIL 335 | (3) | Soil Ecology and Management |
| WILD 401 | (4) | Fisheries and Wildlife Management |

| | | |
|---|---|---|
| WILD 415* | (2) | Conservation Law |
| WOOD 441 | (3) | Integrated Forest Management |

## 10 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.

1. **Core:** The Core consists of four introductory courses and one intermediate-level course where students are exposed to the different approaches, perspectives, and world views that will help them gain an understanding of the complexity and conflicts that underlie most environmental problems. Through the Core program students go beyond the confines of their individual views of environment.
2. **Domain:** Domains provide a trans-disciplinary study of a particular theme or component of the environment. B.Sc.(Ag.Env.Sc.) and B.Sc. students can choose to follow one of the following domains:

    - Biodiversity and Conservation
    - Ecological Determinants of Health (Population, and Cellular stream options)
    - Environmetrics
    - Food Production and Environment
    - Land Surface Processes and Environmental Change
    - Renewable Resource Management
    - Water Environments and Ecosystems (Biological, and Physical stream options)

    B.Sc. students in the Faculty of Science can also choose from the following two domains:

    - Atmospheric Environment and Air Quality
    - Earth Sciences and Economics

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

To obtain a Major in Environment, students must:

- register in a Domain online 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
- fulfil all faculty requirements as specified by the faculty in which they are registered: for the B.Sc.(Ag.Env.Sc.), refer to *Faculty of Agricultural and Environmental Sciences* > *Faculty Information and Regulations*; for the B.Sc., see *Faculty of Science* >

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

### Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://www.mcgill.ca/mse), or contact Ms. Kathy Roulet, the Program Advisor (kathy.roulet@mcgill.ca).

### Program Requirements

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.

Location Note: When planning their schedule and registering for courses, students should verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue.

### Core: Required Courses (18 credits)

Location Note: Core required courses are taught at both McGill's downtown campus and at the Macdonald campus in Ste. Anne de Bellevue. You should register in Section 001 of an ENVR course that you plan to take on the downtown campus, and in Section 051 of an ENVR course that you plan to take on the Macdonald campus.

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

### Core: Complementary Course - Senior Research Project (3 credits)

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

### Domain: Complementary Courses (42 credits)

42 credits of complementary courses are selected as follows:

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

3 credits - ecology

3 credits - statistics

9 credits - interface between science, policy and management

3 credits - field courses

6 credits - general scientific principles

3 credits - social science

6 credits - organisms and diversity

### Biological Principles of Diversity/Systematics/Conservation:

9 credits are chosen from basic courses in the biological principles of diversity, systematics and conservation as follows:

one of:

| | | |
|---|---|---|
| AEBI 212 | (3) | Evolution and Phylogeny |

| | | |
|---|---|---|
| BIOL 304 | (3) | Evolution |

one of:

| | | |
|---|---|---|
| AEBI 211 | (3) | Organisms 2 |
| BIOL 305 | (3) | Animal Diversity |

one of:

| | | |
|---|---|---|
| BIOL 465 | (3) | Conservation Biology |
| WILD 421 | (3) | Wildlife Conservation |

| | | |
|---|---|---|
| GEOG 497 | (3) | Ecology of Coastal Waters |
| GEOG 499 | (3) | Subarctic Field Studies |
| WILD 475 | (3) | Desert Ecology |

**Organisms and Diversity:**

6 credits of organisms and diversity selected as follows:

* Note: you may take BIOL 350 or ENTO 350 but not both; you may take BIOL 540 or ENVR 540 but not both.

| | | |
|---|---|---|
| AGRI 340 | (3) | Principles of Ecological Agriculture |
| ANTH 311 | (3) | Primate Behaviour and Ecology |
| BIOL 335 | (3) | Marine Mammals |
| BIOL 350* | (3) | Insect Biology and Control |
| BIOL 355 | (3) | Trees: Ecology & Evolution |
| BIOL 427 | (3) | Herpetology |
| BIOL 540* | (3) | Ecology of Species Invasions |
| ENTO 350* | (3) | Insect Biology and Control |
| ENTO 352 | (3) | Control of Insect Pests |
| ENTO 440 | (3) | Insect Diversity |
| ENVR 540* | (3) | Ecology of Species Invasions |
| PLNT 304 | (3) | Biology of Fungi |
| PLNT 358 | (3) | Flowering Plant Diversity |
| PLNT 458 | (3) | Flowering Plant Systematics |
| WILD 307 | (3) | Natural History of Vertebrates |
| WILD 350 | (3) | Mammalogy |
| WILD 420 | (3) | Ornithology |
| WILD 424 | (3) | Parasitology |

## 10.2 Ecological Determinants of Health Domain

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

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet | Professor Marilyn Scott<br>Email: |

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://www.mcgill.ca/mse), or contact Ms. Kathy Roulet, the Program Advisor (kathy.roulet@mcgill.ca).

### Program Requirements

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.

Location Note: When planning your schedule and registering for courses, you would verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald campus in Ste. Anne de Bellevue.

### Core: Required Courses (18 credits)

Location Note: Core Required courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue. You should register in Section 001 of an ENVR course that you plan to take on the downtown campus, and in Section 051 of an ENVR course that you plan to take on the Macdonald campus.

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

### Core: Complementary Course - Senior Research Project (3 credits)

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

### Domain: Required Course (3 credits)

| | | |
|---|---|---|
| PARA 410 | (3) | Environment and Infection |

### Domain: Complementary Courses (39 credits)

39 credits of the Complementary Courses are selected as follows:

21 credits - Fundamentals, 3 credits from each category

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

6 credits - Natural Environment, maximum of 3 credits from any one category

### Fundamentals:

21 credits of Fundamentals, 3 credits from each category.

### Health, Society and Environment

* Note: you may take GEOG 221 or NRSC 221 but not both.

| | | |
|---|---|---|
| GEOG 221* | (3) | Environment and Health |
| GEOG 303 | (3) | Health Geography |
| NRSC 221* | (3) | Environment and Health |
| SOCI 234 | (3) | Population and Society |
| SOCI 309 | (3) | Health and Illness |

### Toxicology

(3)(3) Animal Health and Disease

| | | |
|---|---|---|
| WILD 424 | (3) | Parasitology |

**Nutrition**

| | | |
|---|---|---|
| NUTR 403 | (3) | Nutrition in Society |
| NUTR 512 | (3) | Herbs, Foods and Phytochemicals |

**Drugs and Hormones**

| | | |
|---|---|---|
| ANSC 424 | (3) | Metabolic Endocrinology |
| PHAR 300 | (3) | Drug Action |

**Physiology**

| | | |
|---|---|---|
| ANSC 323 | (3) | Mammalian Physiology |
| PHGY 209 | (3) | Mammalian Physiology 1 |

**Natural Environment:**

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

**Hydrology and Climate**

| | | |
|---|---|---|
| AGRI 452 | (3) | Water Resources in Barbados |
| BREE 217 | (3) | Hydrology and Water Resources |
| GEOG 321 | (3) | Climatic Environments |
| GEOG 322 | (3) | Environmental Hydrology |
| NRSC 510 | (3) | Agricultural Micrometeorology |

**Techniques and Management**

| | | |
|---|---|---|
| BREE 322 | (3) | Organic Waste Management |
| CHEE 230 | (3) | Environmental Aspects of Technology |
| GEOG 302 | (3) | Environmental Management 1 |
| NRSC 437 | (3) | Assessing Environmental Impact |
| URBP 507 | (3) | Planning and Infrastructure |

**Pest Management**

* Note: you may take BIOL 350 or ENTO 350 but not both.

| | | |
|---|---|---|
| BIOL 350* | (3) | Insect Biology and Control |
| ENTO 350* | (3) | Insect Biology and Control |
| ENTO 352 | (3) | Control of Insect Pests |

**Pollution Control and Management**

| | | |
|---|---|---|
| BREE 518 | (3) | Bio-Treatment of Wastes |
| NRSC 333 | (3) | Pollution and Bioremediation |

**Ecology**

* Note: you may take ENVR 540 or BIOL 540 but not both.

| | | |
|---|---|---|
| BIOL 432 | (3) | Limnology |
| BIOL 465 | (3) | Conservation Biology |
| BIOL 540* | (3) | Ecology of Species Invasions |
| BIOL 553 | (3) | Neotropical Environments |
| ENVB 410 | (3) | Ecosystem Ecology |
| ENVR 540* | (3) | Ecology of Species Invasions |
| MICR 331 | (3) | Microbial Ecology |

| | | |
|---|---|---|
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

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

| | | |
|---|---|---|
| PARA 410 | (3) | Environment and Infection |

**Domain: Complementary Courses (39 credits)**

39 credits of Complementary Courses are selected as follows:

21 credits - Fundamentals, maximum of 3 credits from each category

6 credits - List A categories, maximum of 3 credits from any one category

12 credits - List B categories, maximum of 3 credits from any one category

**Fundamentals:**

21 credits of fundamentals, 3 credits from each category:

**Health and Envir**

| | | |
|---|---|---|
| ANSC 330 | (3) | Fundamentals of Nutrition |
| NUTR 207 | (3) | Nutrition and Health |
| NUTR 307* | (3) | Human Nutrition |

**Advanced Ecology**

* Note: you may take ENVR 540 or BIOL 540 but not both.

| | | |
|---|---|---|
| AEMA 406 | (3) | Quantitative Methods: Ecology |
| BIOL 465 | (3) | Conservation Biology |
| BIOL 540* | (3) | Ecology of Species Invasions |
| BIOL 553 | (3) | Neotropical Environments |
| ENVB 410 | (3) | Ecosystem Ecology |
| ENVR 540* | (3) | Ecology of Species Invasions |
| MICR 331 | (3) | Microbial Ecology |
| PLNT 460 | (3) | Plant Ecology |
| WILD 410 | (3) | Wildlife Ecology |

**List A:**

6 credits from the following List A categories, maximum of 3 credits from any one category:

**Hydrology, Climate, and Agriculture**

| | | |
|---|---|---|
| AGRI 340 | (3) | Principles of Ecological Agriculture |
| AGRI 452 | (3) | Water Resources in Barbados |
| AGRI 550 | (3) | Sustained Tropical Agriculture |
| BREE 217 | (3) | Hydrology and Water Resources |
| GEOG 321 | (3) | Climatic Environments |
| GEOG 322 | (3) | Environmental Hydrology |
| NRSC 510 | (3) | Agricultural Micrometeorology |

**Decision Making and Social Change**

* Note: you may take AGEC 200 or ECON 208 but not both.

| | | |
|---|---|---|
| AGEC 200* | (3) | Principles of Microeconomics |
| AGEC 242 | (3) | Management Theories and Practices |
| BTEC 502 | (3) | Biotechnology Ethics and Society |
| ECON 208* | (3) | Microeconomic Analysis and Applications |
| EDER 461 | (3) | Society and Change |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 404 | (3) | Environmental Management 2 |
| PHIL 343 | (3) | Biomedical Ethics |
| URBP 520 | (3) | Globalization: Planning and Change |

**Development and History**

| | | |
|---|---|---|
| AGRI 210 | (3) | Agro-Ecological History |
| ANTH 212 | (3) | Anthropology of Development |

| | | |
|---|---|---|
| HIST 292 | (3) | History and the Environment |
| SOCI 254 | (3) | Development and Underdevelopment |

**List B:**

12 credits from the following list B categories, maximum of 3 credits from any one category:

**Techniques and Management**

| | | |
|---|---|---|
| CHEE 230 | (3) | Environmental Aspects of Technology |
| GEOG 201 | (3) | Introductory Geo-Information Science |
| NRSC 430 | (3) | GIS for Natural Resource Management |
| NRSC 437 | (3) | Assessing Environmental Impact |
| URBP 507 | (3) | Planning and Infrastructure |

**Immunology and Infectious Disease**

| | | |
|---|---|---|
| ANSC 400 | (3) | Eukaryotic Cells and Viruses |
| MIMM 314 | (3) | Immunology |
| MIMM 324 | (3) | Fundamental Virology |
| MIMM 413 | (3) | Parasitology |
| PARA 438 | (3) | Immunology |
| WILD 424 | (3) | Parasitology |

| | | |
|---|---|---|
| LSCI 204 | (3) | Genetics |

## 10.3 Environmetrics Domain

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

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306 | Professor Pierre Dutilleul<br>Email: *pierre.dutilleul@mcgill.ca*<br>Telephone: 514-398-7870 |

### 10.3.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Major Environment - Environmetrics (63 credits)

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.

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

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

#### Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the 'MSE Student Handbook 2010-11' (available on the MSE website http://www.mcgill.ca/mse, or contact Kathy Roulet, the Program Advisor (kathy.roulet@mcgill.ca).

Prerequisites and equivalent courses are common with math courses, so check with your advisor when choosing your courses. Be especially careful with statistics courses, as you will receive no credit (and no warning!) for a course that is considered equivalent to one you have already taken. Note: Credit given for statistics courses is subject to certain restrictions. Students in Science should consult the "Course Overlap" information in the "Course Requirements" section for the Faculty of Science.

Statistics courses BIOL 373 OR AEMA 310 can be taken in U1, but do not take them if you want to follow Option 1 (below), as they overlap with MATH 324.

#### Program Requirements

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.

Location Note: When planning their schedule and registering for courses, students should verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue.

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

Location Note: Core Required courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue. You should register in Section 001 of an ENVR course if you want to take it on the downtown campus, and in Section 051 of an ENVR course if you want to take it on the Macdonald campus.

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

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

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |
| ENVR 401 | (3) | Environmental Research |
| | | Research in P |

| | | |
|---|---|---|
| GEOG 322 | (3) | Environmental Hydrology |
| GEOG 350 | (3) | Ecological Biogeography |

3 credits minimum of environmental sciences chosen from:

| | | |
|---|---|---|
| AGRI 452 | (3) | Water Resources in Barbados |
| AGRI 550 | (3) | Sustained Tropical Agriculture |
| BIOL 331 | (3) | Ecology/Behaviour Field Course |
| BIOL 553 | (3) | Neotropical Environments |
| ENVB 313 | (3) | Phylogeny and Biogeography |
| GEOG 300 | (3) | Human Ecology in Geography |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 404 | (3) | Environmental Management 2 |
| GEOG 494 | (3) | Urban Field Studies |
| GEOG 497 | (3) | Ecology of Coastal Waters |
| GEOG 499 | (3) | Subarctic Field Studies |
| NRSC 333 | (3) | Pollution and Bioremediation |
| PLNT 460 | (3) | Plant Ecology |
| WILD 401 | (4) | Fisheries and Wildlife Management |
| WOOD 300 | (3) | Urban Forests and Trees |
| WOOD 420 | (3) | Environmental Issues: Forestry |

## 10.4 Food Production and Environment Domain

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

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306 | Professor Joan Marshall<br>email: *joan.marshall@mcgill.ca*<br>Telephone: 514-398-7822 |

### 10.4.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Major Environment - Food Production and Environment (63 credits)

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.

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| | | |
|---|---|---|
| LSCI 211 | (3) | Biochemistry 1 |

One of the following courses or CEGEP equivalent (e.g., CEGEP objective 00XV).

| | | |
|---|---|---|
| CHEM 212 | (4) | Introductory Organic Chemistry 1 |
| FDSC 230 | (4) | Organic Chemistry |

### Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://www.mcgill.ca/mse), or contact Ms. Kathy Roulet, the Program Advisor (kathy.roulet@mcgill.ca).

### Program Requirements

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.

Location Note: When planning their schedule and registering for courses, students should verify where each course is offered because courses for this program

One of the following statistics courses or equivalent:

Note: Credit given for statistics courses is subject to certain restrictions. Students in Science should consult the "Course Overlap" information in the "Course Requirements" section for the Faculty of Science.

| | | |
|---|---|---|
| AEMA 310 | (3) | Statistical Methods 1 |
| MATH 203 | (3) | Principles of Statistics 1 |

One of:

| | | |
|---|---|---|
| AGRI 340 | (3) | Principles of Ecological Agriculture |
| ANSC 250 | (3) | Principles of Animal Science |

One of:

| | | |
|---|---|---|
| BIOL 202 | (3) | Basic Genetics |
| LSCI 204 | (3) | Genetics |

One of:

| | | |
|---|---|---|
| ENVB 210 | (3) | The Biophysical Environment |
| GEOG 305 | (3) | Soils and Environment |

One of:

| | | |
|---|---|---|
| BIOL 308 | (3) | Ecological Dynamics |
| ENVB 305 | (3) | Population & Community Ecology |

### Applied Sciences:

12 credits of Applied Sciences from the following:

* Note: you may take BREE 217 or GEOG 322 but not both; you may take FDSC 200 or NUTR 207 but not both.

| | | |
|---|---|---|
| AGRI 411 | (3) | Global Issues on Development, Food and Agriculture |
| AGRI 435 | (3) | Soil and Water Quality Management |
| AGRI 550 | (3) | Sustained Tropical Agriculture |
| BIOL 465 | (3) | Conservation Biology |
| BIOL 553 | (3) | Neotropical Environments |
| BREE 217* | (3) | Hydrology and Water Resources |
| BREE 322 | (3) | Organic Waste Management |
| BREE 518 | (3) | Bio-Treatment of Wastes |
| ENTO 446 | (3) | Apiculture |
| FDSC 200* | (3) | Introduction to Food Science |
| FDSC 535 | (3) | Food Biotechnology |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 322* | (3) | Environmental Hydrology |
| GEOG 380 | (3) | Adaptive Environmental Management |
| MICR 331 | (3) | Microbial Ecology |

| | | |
|---|---|---|
| NRSC 333 | (3) | Pollution and Bioremediation |
| NRSC 437 | (3) | Assessing Environmental Impact |
| NUTR 207* | (3) | Nutrition and Health |
| NUTR 403 | (3) | Nutrition in Society |
| NUTR 420 | (3) | Toxicology and Health Risks |
| PARA 410 | (3) | Environment and Infection |
| PHAR 303 | (3) | Principles of Toxicology |
| PLNT 434 | (3) | Weed Biology and Control |
| SOIL 315 | (3) | Soil Fertility and Fertilizer Use |
| SOIL 445 | (3) | Agroenvironmental Fertilizer Use |
| SOIL 510 | (3) | Environmental Soil Chemistry |
| SOIL 521 | (3) | Soil Microbiology and Biochemistry |
| WILD 401 | (4) | Fisheries and Wildlife Management |

**Social Sciences/Humanities:**

6 credits in Social Sciences and Humanities are selected as follows:

* Note: you may take AGEC 200 or ECON 208 but not both; you may take AGEC 333 or ECON 405 but not both.

** Note: If WILD 415 is taken, 1 additional credit of complementary courses must be taken.

| | | |
|---|---|---|
| AGEC 200* | (3) | Principles of Microeconomics |
| AGEC 320 | (3) | Intermediate Microeconomic Theory |
| AGEC 333* | (3) | Resource Economics |
| AGEC 430 | (3) | Agriculture, Food and Resource Policy |
| AGEC 442 | (3) | Economics of International Agricultural Development |
| ANTH 418 | (3) | Environment and Development |
| ECON 208* | (3) | Microeconomic Analysis and Applications |
| ECON 225 | (3) | Economics of the Environment |
| ECON 405* | (3) | Natural Resource Economics |
| ENVR 465 | (3) | Environment and Social Change |
| GEOG 404 | (3) | Environmental Management 2 |
| GEOG 410 | (3) | Geography of Underdevelopment: Current Problems |
| GEOG 498 | (3) | Humans in Tropical Environments |
| GEOG 510 | (3) | Humid Tropical Environments |
| SOCI 254 | (3) | Development and Underdevelopment |
| SOCI 565 | (3) | Social Change in Panama |
| WILD 415** | (2) | Conservation Law |

## 10.5 Land Surface Processes and Environmental Change Domain

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

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet | Professor Ian Strachan<br>Email: Email: Email: Email: virvironment 9ope10 0hano studersi1 0 0 1 221.94915r |

| Advisor | Mentor |
|---|---|
| Telephone: 514-398-4306 | Telephone: 514-398-7935 |

### 10.5.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.)-Major Environment - Land Surface Processes and Environmental Change (63 credits)

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.

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 vapour, 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.

#### Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://www.mcgill.ca/mse), or contact Ms. Kathy Roulet, the Program Advisor (kathy.roulet@mcgill.ca).

#### Program Requirements

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.

Location Note: Core Required courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue.

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

Location Note: Core required courses for this program are taught at both McGill's downtown campus and at the Macdonald campus in Ste. Anne de Bellevue. You should register in Section 001 of an ENVR course that you plan to take on the downtown campus, and in Section 051 of an ENVR course that you plan to take on the Macdonald campus.

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

#### Core: Complementary Course - Senior Research Project (3 credits)

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

#### Domain Required Course (3 credits)

| | | |
|---|---|---|
| GEOG 203 | (3) | Environmental Systems |

#### Domain: Complementary Courses (39 credits)

39 credits of Complementary Courses are selected as follows:

9 credits - 3 credits from each category of Statistics, Geo-Information Science, Weather and Climate

9 credits of fundamental land surface processes

3 credits of environment and resource management

3 credits of field course

3 credits of social science

12 credits total of advanced studies chosen from the List A: Particular Environments and the List B: Surface Processes

**Statistics**

One of the following statistics courses or equivalent:

Note: Credit given for statistics courses is subject to certain restrictions. Students in Science should consult the "Course Overlap" information in the "Course Requirements" section for the Faculty of Science.

| | | |
|---|---|---|
| AEMA 310 | (3) | Statistical Methods 1 |
| GEOG 202 | (3) | Statistics and Spatial Analysis |
| MATH 203 | (3) | Principles of Statistics 1 |

**GIS and Remote Sensing Techniques**

one of:

| | | |
|---|---|---|
| GEOG 201 | (3) | Introductory Geo-Information Science |
| GEOG 308 | (3) | Principles of Remote Sensing |
| NRSC 430 | (3) | GIS for Natural Resource Management |

**Weather and Climate**

one of:

| | | |
|---|---|---|
| ATOC 215 | (3) | Oceans, Weather and Climate |
| ENVB 301 | (3) | Meteorology |

**Fundamental Land Surface Processes:**

9 credits of fundamental land surface processes chosen as follows:

| | | |
|---|---|---|
| GEOG 321 | (3) | Climatic Environments |

and/or one of:

| | | |
|---|---|---|
| GEOG 272 | (3) | Earth's Changing Surface |
| SOIL 300 | (3) | Geosystems |

and/or one of:

| | | |
|---|---|---|
| GEOG 305 | (3) | Soils and Environment |
| SOIL 326 | (3) | Soils in a Changing Environment |

and/or one of:

| | | |
|---|---|---|
| BREE 217 | (3) | Hydrology and Water Resources |
| GEOG 322 | (3) | Environmental Hydrology |

**Environment and Resource Management:**

one of:

| | | |
|---|---|---|
| AGRI 435 | (3) | Soil and Water Quality Management |
| AGRI 452 | (3) | Water Resources in Barbados |
| AGRI 550 | (3) | Sustained Tropical Agriculture |
| BIOL 308 | (3) | Ecological Dynamics |
| BIOL 465 | (3) | Conservation Biology |
| CHEE 230 | (3) | Environmental Aspects of Technology |
| CIVE 225 | (4) | Environmental Engineering |
| ENVB 305 | (3) | Population & Community Ecology |
| ESYS 301 | (3) | Earth System Modelling |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 380 | (3) | Adaptive Environmental Management |
| GEOG 404 | (3) | Environmental Management 2 |
| NRSC 437 | (3) | Assessing Environmental Impact |
| WILD 421 | (3) | Wildlife Conservation |
| WOOD 420 | (3) | Environmental Issues: Forestry |
| WOOD 441 | (3) | Integrated Forest Management |

**Field Course:**

one of:

| | | |
|---|---|---|
| BIOL 553 | (3) | Neotropical Environments |
| GEOG 495 | (3) | Field Studies - Physical Geography |
| GEOG 496 | (3) | Geographical Excursion |
| GEOG 499 | (3) | Subarctic Field Studies |
| NRSC 437 | (3) | Assessing Environmental Impact |
| WILD 475 | (3) | Desert Ecology |

**Social Science:**

one of:

| | | |
|---|---|---|
| AGEC 333 | (3) | Resource Economics |
| ANTH 339 | (3) | Ecological Anthropology |
| ECON 225 | (3) | Economics of the Environment |
| ECON 326 | (3) | Ecological Economics |
| ECON 405 | (3) | Natural Resource Economics |
| GEOG 221 | (3) | Environment and Health |
| GEOG 408 | (3) | Geography of Development |
| GEOG 498 | (3) | Humans in Tropical Environments |
| GEOG 508 | (3) | Resources, People and Power |
| NRSC 221 | (3) | Environment and Health |
| SOCI 565 | (3) | Social Change in Panama |
| URBP 520 | (3) | Globalization: Planning and Change |

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

### List A - Particular Environments:

3 to 9 credits of advanced study of Particular Environments:

| | | |
|---|---|---|
| BIOL 432 | (3) | Limnology |
| ENVB 315 | (3) | Science of Inland Waters |
| ENVB 410 | (3) | Ecosystem Ecology |
| GEOG 350 | (3) | Ecological Biogeography |
| GEOG 372 | (3) | Running Water Environments |
| GEOG 470 | (3) | Wetlands |
| GEOG 536 | (3) | Geocryology |
| GEOG 550 | (3) | Historical Ecology Techniques |
| PLNT 358 | (3) | Flowering Plant Diversity |
| PLNT 460 | (3) | Plant Ecology |

### List B - Surface Processes:

3 to 9 credits advanced study of Surface Processes:

| | | |
|---|---|---|
| ATOC 315 | (3) | Water in the Atmosphere |
| BREE 509 | (3) | Hydrologic Systems and Modelling |
| EPSC 549 | (3) | Hydrogeology |
| EPSC 580 | (3) | Aqueous Geochemistry |
| GEOG 501 | (3) | Modelling Environmental Systems |
| GEOG 505 | (3) | Global Biogeochemistry |
| GEOG 522 | (3) | Advanced Environmental Hydrology |
| GEOG 537 | (3) | Advanced Fluvial Geomorphology |
| NRSC 333 | (3) | Pollution and Bioremediation |
| SOIL 331 | (3) | Soil Physics |
| SOIL 510 | (3) | Environmental Soil Chemistry |

## 10.6 Renewable Resource Management Domain

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

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet, MSE Program Advisor<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306**Ag.En63s adv**63s advAg.En | Professor Sylvie deBlois<br>Email: *sylvie.deblois@mcgill.ca*<br>Telephone: 514-398-7851 |

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 pro

6 credits - advanced ecosystem components

6 credits - advanced ecological processes

6 credits - social processes

9 credits - ecosystem components or management of ecosystems

**Basic Principles of Ecosystem Processes:**

9 credits of basic principles of ecosystem processes and diversity are selected as follows:

one of:

| | | |
|---|---|---|
| AEBI 210 | (3) | Organisms 1 |
| AEBI 211 | (3) | Organisms 2 |
| BIOL 305 | (3) | Animal Diversity |

one of:

| | | |
|---|---|---|
| BIOL 308 | (3) | Ecological Dynamics |
| ENVB 305 | (3) | Population & Community Ecology |

one of:

The Biophysao6221roso.h

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306 | Professor Brian Leung<br>Email: *brian.leung2@mcgill.ca*<br>Telephone: 514-398-6460 |

**Water Environments and Ecosystems – Physical**

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306 | Professor Nigel Roulet<br>Email: *nigel.roulet@mcgill.ca*<br>Telephone: 514-398-4945 |

### 10.7.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Major Environment -Water Environments and Ecosystems - Biological (60 credits)

This concentration (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.

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

Those electing the Biological concentration will focus 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 concentration. 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.

#### Suggested First Year (U1) Courses

For suggestions of courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://www.mcgill.ca/mse), or contact Ms. Kathy Roulet, Program Advisor (kathy.roulet@mcgill.ca).

#### Program Requirements

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.

Location Note: When planning your schedule and registering for courses, you should verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald campus in Ste. Anne de Bellevue.

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

Location Note: Core Required courses for this program are taught at both McGill's downtown campus and at the Macdonald Campus in Ste. Anne de Bellevue. You should register in Section 001 of an ENVR course that you plan to take on the downtown campus, and in Section 051 of an ENVR course that you plan to take on the Macdonald campus.

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

#### Core: Complementary Course - Senior Research Project (3 credits)

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |

| | | |
|---|---|---|
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

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

| | | |
|---|---|---|
| ATOC 214 | (3) | Introduction: Physics of the Atmosphere |

| | | |
|---|---|---|
| ANTH 339 | (3) | Ecological Anthropology |
| ANTH 418 | (3) | Environment and Development |
| ECON 225 | (3) | Economics of the Environment |
| ECON 326 | (3) | Ecological Economics |
| GEOG 404 | (3) | Environmental Management 2 |
| GEOG 498 | (3) | Humans in Tropical Environments |
| | (3) | International Organizations |

| | | |
|---|---|---|
| CHEM 297* | (1) | Introductory Analytical Chemistry Laboratory |
| CHEM 419* | (3) | Advances in Chemistry of Atmosphere |
| EPSC 220 | (3) | Principles of Geochemistry |
| GEOG 201 | (3) | Introductory Geo-Information Science |
| GEOG 308 | (3) | Principles of Remote Sensing |
| GEOG 372 | (3) | Running Water Environments |
| GEOG 522 | (3) | Advanced Environmental Hydrology |
| GEOG 537 | (3) | Advanced Fluvial Geomorphology |
| GEOG 550 | (3) | Historical Ecology Techniques |
| NRSC 430 | (3) | GIS for Natural Resource Management |

### 10.7.2 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Major Environment - Water Environments and Ecosystems - Physical (63 credits)

This concentration (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.

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

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 concentration. They will acquire, as well, a solid background in the biological processes taking place in water bodies. Those electing the Biological concentration will focus 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.

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.

#### Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2010-11" available on the MSE website (http://www.mcgill.ca/mse), or contact Ms. Kathy Roulet, the Program Advisor (kathy.roulet@mcgill.ca).

#### Program Requirements

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.

| | | |
|---|---|---|
| ENVR 451 | (6) | Research in Panama |

**Domain: Required Courses (12 credits)**

| | | |
|---|---|---|
| ATOC 214 | (3) | Introduction: Physics of the Atmosphere |
| ATOC 215 | (3) | Oceans, Weather and Climate |
| ATOC 315 | (3) | Water in the Atmosphere |
| GEOG 372 | (3) | Running Water Environments |

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

30 credits of Complementary Courses are selected as follows:

6 credits - hydrology/water resources, population, community and ecology

3 credits - statistics or calculus

3 credits - field course

12 credits chosen from List A

6 credits chosen from List B

**Hydrology/Water Resources, Population/Community and Ecology**

6 credits selected as follows:

one of:

| | | |
|---|---|---|
| BREE 217 | (3) | Hydrology and Water Resources |
| GEOG 322 | (3) | Environmental Hydrology |

and one of:

| | | |
|---|---|---|
| BIOL 308 | (3) | Ecological Dynamics |
| ENVB 305 | (3) | Population & Community Ecology |

**Statistics or Calculus:**

one of:

* Note: AEMA 310 or equivalent.

Note: Credit given for statistics courses is subject to certain restrictions. Students in Science should consult the "Course Overlap" information in the "Course Requirements" section for the Faculty of Science.

| | | |
|---|---|---|
| AEMA 202 | (3) | Intermediate Calculus |
| AEMA 310* | (3) | Statistical Methods 1 |
| MATH 203 | (3) | Principles of Statistics 1 |
| MATH 222 | (3) | Calculus 3 |

**Field Course:**

3 credits selected from the following courses or an equivalent aquatic field course:

| | | |
|---|---|---|
| AGRI 452 | (3) | Water Resources in Barbados |
| GEOG 495 | (3) | Field Studies - Physical Geography |

**List A:**

12 credits chosen from:

Soil and W

# 11 Major in Environment – B.Sc.

In addition to the 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.Sc." students in the Faculty of Science can choose from one of the following two Domains:

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

Refer to *section 10: Major in Environment – B.Sc.(Ag.Env.Sc.) and B.Sc.* for the general guidelines and regulations which apply to all Domains in the Major in Environment program.

## 11.1 Atmospheric Environment and Air Quality Domain

This domain is open only to students in the B.Sc. Major in Environment program in the Faculty of Science.

| Advisor | Mentor |
|---|---|
| Ms. Kathy Roulet<br>Email: *kathy.roulet@mcgill.ca*<br>Telephone: 514-398-4306 | Professor Frédéric Fabry<br>Email: *frederic.fabry@mcgill.ca*<br>Telephone: 514-398-3652 |

### 11.1.1 Bachelor of Science (B.Sc.) - Major Environment - Atmospheric Environment and Air Quality (60 credits)

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-ho

### Core: Complementary Course - Senior Research Project (3 credits)

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

| | | |
|---|---|---|
| AGRI 519 | (6) | Sustainable Development Plans |
| ENVR 401 | (3) | Environmental Research |
| ENVR 451 | (6) | Research in Panama |

### Domain: Required Courses (18 credits)

18 credits are selected from:

* Note: you may take k

* Note: you may take ATOC 419 or CHEM 419 but not both; you may take MATH 315 or AEMA 305 but not both.

| | | | | |
|---|---|---|---|---|
| AEMA 305* | (3) | Differential Equations | | |
| ATOC 309 | (3) | Weather Radars and Satellites | | |
| ATOC 412 | (3) | Atmospheric Dynamics | | |
| ATOC 419* | (3) | Advances in Chemistry of Atmosphere | (3) | |
| ATOC 540 | (3) | Synoptic Meteorology 1 | | |
| CHEE 230 | (3) | Environmental Aspects of Technology | | |

Introductory Physical

3 credits - statistics courses

9 credits - List A

12 credits - List B

### Statistics:

One of the following statistics courses or equivalent.

Note: Credit given for statistics courses is subject to certain restrictions. Students in Science should consult the "Course Overlap" information in the "Course Requirements" section for the Faculty of Science.

| | | |
|---|---|---|
| AEMA 310 | (3) | Statistical Methods 1 |
| GEOG 202 | (3) | Statistics and Spatial Analysis |
| MATH 203 | (3) | Principles of Statistics 1 |

### List A:

9 credits from:

*Note: you may take CHEE 430 or NRSC 437 but not both.

| | | |
|---|---|---|
| AGEC 333 | (3) | Resource Economics |
| CHEE 430* | (3) | Technology Impact Assessment |
| ECON 326 | (3) | Ecological Economics |
| ECON 347 | (3) | Economics of Climate Change |
| ECON 416 | (3) | Topics in Economic Development 2 |
| ECON 525 | (3) | Project Analysis |
| NRSC 437* | (3) | Assessing Environmental Impact |

### List B:

12 credits from:

| | | |
|---|---|---|
| AGRI 435 | (3) | Soil and Water Quality Management |
| ANTH 339 | (3) | Ecological Anthropology |
| BIOL 305 | (3) | Animal Diversity |
| BIOL 553 | (3) | Neotropical Environments |
| ECON 305 | (3) | Industrial Organization |
| ECON 313 | (3) | Economic Development 1 |
| ECON 314 | (3) | Economic Development 2 |
| ECON 408 | (3) | Public Sector Economics 1 |
| ECON 409 | (3) | Public Sector Economics 2 |
| ECON 412 | (3) | Topics in Economic Development 1 |
| EPSC 312 | (3) | Spectroscopy of Minerals |
| EPSC 331 | (3) | Field School 2 |
| EPSC 341 | (3) | Field School 3 |
| EPSC 425 | (3) | Sediments to Sequences |
| EPSC 435 | (3) | Applied Geophysics |
| EPSC 452 | (3) | Mineral Deposits |
| EPSC 519 | (3) | Isotope Geology |
| EPSC 542 | (3) | Chemical Oceanography |
| EPSC 549 | (3) | Hydrogeology |

## 12.2 Bachelor of Science (B.Sc.) - Honours Environment (72 credits)

This Program is open only to students in the B.Sc. Major Environment. To be eligible for Honours, students must satisfy the requirements set by their B.Sc. degree.

In addition, students must satisfy the following:

1. Students apply for the Honours program in March of their U2 year

### 12.4 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) - Honours Environment (69 credits)

This Program is open only to students in the B.Sc. (Ag.Env.Sc.) Major Environment. To be eligible for Honours, students must satisfy the requirements set by their B.Sc.(Ag.Env.Sc.) degree.

In addition, students must satisfy the following:

1. Students apply for the Honours program in March of their U2 year. See the Program Advisor for details.

2. Applicants must have a minimum Program GPA (GPA of all required and complementary courses for the program in Environment taken at McGill) of 3.3 to enter the Honours program.

3. Students must earn a B grade (3.0) or higher for the Honours Research courses (ENVR 496 and ENVR 497).

4. Students are required to achieve a minimum overall CGPA of 3.0 at graduation, and a minimum Program GPA of 3.3 to obtain Honours.

Students in the B.Sc.(Ag.Env.Sc.) Honours program complete the Core and Domain courses (60 to 63 credits) according to their chosen Domain as well as the 6 credits of required Honours courses.

At the completion of your Honours research, you are expected to present your results at an Honours Symposium, and are required to submit a copy of your final report to the MSE Program Advisor.

#### Honours - Required Courses (6 credits)

| | | |
|---|---|---|
| ENVR 496 | (3) | Honours Research Part 1 |
| ENVR 497 | (3) | Honours Research Part 2 |

## 13 Diploma in Environment

**Advisor**

Ms. Kathy Roulet, MSE Program Advisor
Email: *kathy.roulet@mcgill.ca*
Telephone: 514-398-4306

### 13.1 Diploma in Environment (30 credits)

The Diploma in Environment is designed for students with an undergraduate degree who wish to enrich or reorient their training, supplementing their specialization with additional undergraduate-level course work in Environment.

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.

#### Advising Note:

Consultation with the Program Advisor for approval of course selection to meet program requirements is obligatory. Only courses at the 200-level and above will be approved.

#### Location Note:

When planning your schedule and registering for courses, you should verify where each course is offered because courses for this program are taught at both McGill's downtown campus and at the Macdonald campus in Ste. Anne de Bellevue.

#### Required Courses (18 credits)

Location Note: The ENVR courses are offered on both campuses. You should register in Section 001 of an ENVR course that you plan to take on the downtown campus, and in Section 051 of an ENVR course that you plan to take on the Macdonald campus.

| | | |
|---|---|---|
| ENVR 200 | (3) | The Global Environment |
| ENVR 201 | (3) | Society and Environment |
| ENVR 202 | (3) | The Evolving Earth |
| ENVR 203 | (3) | Knowledge, Ethics and Environment |
| ENVR 301 | (3) | Environmental Research Design |
| ENVR 400 | (3) | Environmental Thought |

### Complementary Courses (12 credits)

12 credits of Complementary Courses are selected as follows:

3 credits - must be taken with the approval of the Program Advisor in an area outside of the student's previous degree (e.g., those with a B.A. or equivalent degree must take at least 3 credits in the natural sciences; those with a B.Sc. or equivalent degree must take at least 3 credits in the social sciences). A list of Suggested Courses is given below.

9 credits - must be taken in an area of focus chosen by the student with the approval of the Program Advisor. At least 6 credits must be taken at the 400-level or higher. A list of Suggested Courses is given below.

### Suggested Courses List

The Suggested Courses List is divided into two Thematic Categories: Social Sciences and Policy; and Natural Sciences and Technology.

Most courses listed at the 300-level and higher have prerequisites. You are urged to prepare your program of study with this in mind.

This list is not meant to be exhaustive. You are also encouraged to examine the course lists.52 474.402 Tm(This list6sIrse lists.52 474474.402 Tm(Y)Tj1 01bh.204 u82 T

### Natural Sciences and Technology

* Note: you may take MIMM 211 or LSCI 230 but not both; you may take ENVB 315 or BIOL 432 but not both.

| | | |
|---|---|---|
| AGRI 340 | (3) | Principles of Ecological Agriculture |
| AGRI 435 | (3) | Soil and Water Quality Management |
| ANSC 326 | (3) | Fundamentals of Population Genetics |
| ANTH 311 | (3) | Primate Behaviour and Ecology |
| ARCH 375 | (2) | Landscape |
| ARCH 377 | (3) | Energy, Environment and Buildings |
| ARCH 378 | (3) | Site Usage |
| ATOC 215 | (3) | Oceans, Weather and Climate |
| BIOL 240 | (3) | Monteregian Flora |
| BIOL 305 | (3) | Animal Diversity |
| BIOL 308 | (3) | Ecological Dynamics |
| | (3)v | Biodiversity and Ecosystems |

| | | |
|---|---|---|
| EPSC 425 | (3) | Sediments to Sequences |
| EPSC 549 | (3) | Hydrogeology |
| ESYS 301 | (3) | Earth System Modelling |
| GEOG 200 | (3) | Geographical Perspectives: World Environmental Problems |
| GEOG 201 | (3) | Introductory Geo-Information Science |
| GEOG 205 | (3) | Global Change: Past, Present and Future |
| GEOG 272 | (3) | Earth's Changing Surface |
| GEOG 308 | (3) | Principles of Remote Sensing |
| GEOG 321 | (3) | Climatic Environments |
| GEOG 322 | (3) | Environmental Hydrology |
| GEOG 372 | (3) | Running Water Environments |
| GEOG 470 | (3) | Wetlands |
| LSCI 230* | (3) | Introductory Microbiology |
| MICR 331 | (3) | Microbial Ecology |
| MIME 308 | (3) | Social Impact of Technology |
| MIME 320 | (3) | Extraction of Energy Resources |
| MIMM 211* | (3) | Introductory Microbiology |
| MIMM 314 | (3) | Immunology |
| MIMM 323 | (3)238272gy | Microbial Physiology |
| MIMM 324 | (3) | Fundamental Virology |
| NRSC 333 | (3) | Pollution and Bioremediation |
| NRSC 340 | (3) | Global Perspectives on Food |
| NRSC 384 | (3) | Field Research Project |
| | | GIS for Natural Resource Managej1 5L5uOf4 |