



**McGill School of Environment
Programs, Courses and University Regulations
2011-2012**

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This publication provides guidance to prospects, applicants, students, f

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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.

Through a range of research and educational initiatives, the MSE aims to aid society in making environmental choices, in the context of diverse environmental world views that will sustain healthy societies within a flourishing biosphere.

Focusing on six themes:

- Biodiversity, Ecosystem Function, and Services

- Climate and Energy

- Disease and Environment

- Environmental Ethics

- Food Security

- Water

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 Adviser, Ms. Kathy Roulet

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Fax: 514-398-1643

Email: kathroulet@mcgill.ca

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Macdonald Campus
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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 |
| Daniel Jutras; LL.B.(Montr.), LL.M.(Harv.) | Dean, Faculty of Law |
| Martin Grant; B.Sc.(PEI), M.Sc., Ph.D.(Tor.) | Dean, Faculty of Science |
| Marilyn Scott; B.Sc.(New Br.), Ph.D.(McG.) | Director |
| 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.(T) | Program Adviser |

[section 4.5 Course Numbering System at McGill](#)

[section 4.6 Examination Regulations](#)

[section 4.7 Courses Outside the Student Faculty](#)

4.1 Admission

You may be admitted to a B.A., B.A.&Sc., B.Sc.(Ag.Env.Sc.), or B.Sc. program offered by the MSE on the University's two campuses: the Macdonald campus (B.Sc.(Ag.Env.Sc.) program) and the Downtown campus (B.A., B.A.&Sc., and B.Sc. programs). You register as a student within your faculty of admission and are governed by all rules and regulations of your faculty.

If you have already completed a Bachelor or an equivalent degree, you may be admitted to the Diploma in Environment through the Faculty of Agricultural and Environmental Sciences, the Faculty of Arts, or the Faculty of Science. You register as a student within your faculty of admission and are governed by all rules and regulations of your faculty relative to the Diploma.

Please see the Undergraduate Admissions Guide found at www.mcgill.ca/applying

4.2 Degree Requirements

To be eligible for a B.A. degree, you must fulfill 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 fulfill 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 fulfill all the faculty and program requirements as indicated in [Faculty of Agricultural and Environmental Sciences - Degree Requirements](#)

To be eligible for a B.Sc. degree, you must fulfill all the faculty and program requirements as indicated in [Faculty of Science - Faculty Degree Requirements](#)

To be eligible for the Diploma in Environment, you must fulfill all program requirements as specified in [Diploma in Environment](#)

To be eligible for an Honours degree, you must fulfill all the faculty and program requirements as indicated in the [Honours and First Class Honours](#)

4.6 Examination Regulations

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



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

See [University Regulations and General Information > Examinations](#) for more information on the University regulations and procedures.

4.7 Courses Outside the Student's Faculty

Students in the Schools B.A., B.A. & Sc., B.Sc., and B.Sc.(Ag.Env.Sc.) programs may take courses outside their faculty according to the regulations of their faculty of admission.

These regulations are not identical:

Arts students, see [Faculty of Arts > Courses Outside the Faculties of Arts and 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 in particular should be aware that some courses are restricted and cannot be taken for credit. See the Science Office for Undergraduate Student Advising (SOUSA) website at www.mcgill.ca/science/sousa check under [Bachelor of Science > General course requirements > Restricted courses outside the Faculty of Science Policy concerning courses outside Faculty of Science](#)

Students in the Diploma of Environment follow the program as specified; see [section 13 Diploma in Environment](#)

5 Overview of Programs Offered

The McGill School of Environment has developed eight programs, which are offered on the Downtown and Macdonald campuses:

1. A Minor in Environment is open to all undergraduate students. For more information, see [section 7 Minor in Environment](#)
2. A Faculty Program in Environment leading to a B.A. is open to students meeting the entrance requirements of the Faculty of Arts. For more information, see [section 8 B.A. Faculty Program in Environment](#)
3. An Interfaculty Program in Environment leading to a B.A. & Sc. is open to students meeting the entrance requirements for the Bachelor of Arts and Science. For more information, see [section 9 Bachelor of Arts and Science \(B.A. & Sc.\) Interfaculty Program in Environment](#)
4. An Interfaculty Program in Sustainability, Science and Society leading to a B.A. & Sc. is offered by the McGill School of Environment in partnership with the Department of Geography. It is open to students meeting the entrance requirements for the Bachelor of Arts and Science. For more information, see [Bachelor of Arts and Science Bachelor of Arts and Science \(B.A. & Sc.\) - Interfaculty Program in Sustainability, Science and Society \(54 credits\)](#)
5. A Major in Environment leading to a B.Sc.(Ag.Env.Sc.) is open to students meeting the entrance requirements of the Faculty of Agricultural and Environmental Sciences. For more information, see [section 10 Major in Environment B.Sc.\(Ag.Env.Sc.\) and B.Sc.](#)
6. A Major in Environment leading to a B.Sc. is open to students meeting the entrance requirements of the Faculty of Science. For more information, see [section 10 Major in Environment B.Sc.\(Ag.Env.Sc.\) and B.Sc.](#)
7. An Honours Program in Environment is open to senior Environment students in the B.A., B.A. & Sc., B.Sc.(Ag.Env.Sc.) and B.Sc. degrees. For more information, see [section 12 Honours Program in Environment](#)
8. A Diploma in Environment is available only to students who have already completed a Bachelor or an equivalent degree, and who want to return to university for further undergraduate study. The Diploma is offered by the Faculty of Agricultural and Environmental Sciences, the Faculty of Arts, and the Faculty of Science. For more information, see [section 13 Diploma in Environment](#)

These programs strive to offer the e

6 Suggested Courses for Freshmen Students

The MSE does not recommend that students in their Freshman (U0) year take the ENVR Core courses. Students in their U1 to U3 years are welcome to take selected ENVR courses, even if they are not in the Environment programs. For Freshman year course selections, students should refer to the website of their respective faculty.

Students in the B.Sc. degree, see www.mcgill.ca/science/sousa/webstudents/u0/bsc_freshman/specific

Students in the B.Sc.(Ag.Env.Sc.) degree, see www.mcgill.ca/macdonald/perspective/freshmanyear/courses

Students in the B.A. & Sc. degree, see www.mcgill.ca/science/sousa/webstudents/u0/bsc_freshman/requirements/#en

Students in the B.A. degree, see www.mcgill.ca/oasis/ba_freshman/selection

7 Minor in Environment

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

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

To obtain a Minor in Environment, students must:

- register for the Minor online, using Minerva;

- submit their program of courses already taken and to be taken for the Minor in Environment to the MSE Program Adviser for approval (only courses

| | | |
|------------|-----|---|
| 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 |
| NRSC 510 | (3) | Agricultural Micrometeorology |
| NRSC 514 | (3) | Freshwater Ecosystems |
| PARA 410 | (3) | Environment and Infection |
| PARA 515 | (3) | Water, Health and Sanitation |
| PLNT 304 | (3) | Biology of Fungi |
| PLNT 305 | (3) | Plant Pathology |
| PLNT 358 | (3) | Flowering Plant Diversity |
| PLNT 426 | (3) | Plant Ecophysiology |
| PLNT 460 | (3) | Plant Ecology |
| SOIL 300 | (3) | Geosystems |
| WILD 410 | (3) | Wildlife Ecology |
| WILD 421 | (3) | Wildlife Conservation |

Consultation with the Program Adviser for approval of course selection to meet program requirements is obligatory. Only courses at the 200 le

| | | |
|----------|-----|---|
| ECON 326 | (3) | Ecological Economics |
| ECON 347 | (3) | Economics of Climate Change |
| ECON 405 | (3) | Natural Resource Economics |
| ENVB 437 | (3) | Assessing Environmental Impact |
| ENVR 201 | (3) | Society, Environment and Sustainability |
| 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 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 |
| | s | Planning the 21st Century City |

The Bioph

| | | |
|----------|-----|-----------------------|
| PLNT 460 | (3) | Plant Ecology |
| SOIL 300 | (3) | Geosystems |
| WILD 410 | (3) | Wildlife Ecology |
| WILD 421 | (3) | Wildlife Conservation |

8 B.A. Faculty Program in Environment

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

1. **Core:** The Core consists of four introductory courses and one intermediate-level course where students are exposed to the different approaches, perspectives, and world vie

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 2011-2012" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Kathy Roulet, the Program Adviser (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, but does not include the program prerequisites or corequisites 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 are taught at both McGill's Downtown campus and at the Macdonald campus in Sainte-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 Sainte-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, Environment and Sustainability |
| 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 |

Techniques and Management

* You may take ENVB 430 or GEOG 201, but not both.

| | | |
|-----------|-----|--------------------------------------|
| CHEE 230 | (3) | Environmental Aspects of Technology |
| ENVB 430* | (3) | GIS for Natural Resource Management |
| GEOG 201* | (3) | Introductory Geo-Information Science |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 380 | (3) | Adaptive Environmental Management |
| PARA 515 | (3) | Water, Health and Sanitation |

Social Change

| | | |
|----------|-----|-----------------------------|
| EDER 461 | (3) | Society and Change |
| HIST 292 | (3) | History and the Environment |

Immunology and Infectious Disease

| | | |
|----------|-----|----------------------|
| MIMM 314 | (3) | Immunology |
| MIMM 324 | (3) | Fundamental Virology |
| MIMM 413 | (3) | Parasitology |
| PARA 438 | (3) | Immunology |
| WILD 424 | (3) | Parasitology |

Populations and Place

| | | |
|----------|-----|---------------------------------|
| CANS 407 | (3) | Regions of Canada |
| GEOG 498 | (3) | Humans in Tropical Environments |
| 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.

| Adviser | Mentor |
|--|---|
| Ms. Kathy Roulet Email: kathyroulet@mcgill.ca Telephone: 514-398-4306 | Professor Jeanne Paquette Email: jeannepaquette@mcgill.ca 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 toward 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 how industrial waste interacts with solids and liquids in the environment. The Earth science and economics studies merge in the final year when the students apply what they have learned in the domain to current environmental issues.

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, one of 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, one of the following, or their equivalents (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 |

Other Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook 2011-2012" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Ms. Kathy Roulet, the Program Adviser (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 12 credits at the 400 level or higher in this program. This includes core and required courses, but does not include the domain prerequisites or corequisites listed above.

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 Sainte-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 Sainte-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, Environment and Sustainability |
| 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 (15 credits)

| | | |
|------------|-----|----------------------------|
| ECON 230D1 | (3) | Microeconomic Theory |
| ECON 230D2 | (3) | Microeconomic Theory |
| ECON 405 | (3) | Natural Resource Economics |
| EPSC 210 | (3) | Introductory Mineralogy |
| EPSC 212 | (3) | Introductory Petrology |

Domain: Complementary Courses (18 credits)

18 credits are selected from various domains as follows:

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 |
| GEOG 202 | (3) | Statistics and Spatial Analysis |
| MATH 203 | (3) | Principles of Statistics 1 |

Economics

6 credits from:

| | | |
|----------|-----|-----------------------------|
| AGEC 333 | (3) | Resource Economics |
| ECON 326 | (3) | Ecological Economics |
| ECON 347 | (3) | Economics of Climate Change |

| | | |
|-----------|-----|------------------------------------|
| EPSC 455 | (3) | Sedimentary Geology |
| EPSC 549 | (3) | Hydrogeology |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 322 | (3) | Environmental Hydrology |
| GEOG 380 | (3) | Adaptive Environmental Management |
| GEOG 404 | (3) | Environmental Management 2 |
| GEOG 498 | (3) | Humans in Tropical Environments |
| SOIL 510 | (3) | Environmental Soil Chemistry |
| URBP 520 | (3) | Globalization: Planning and Change |
| WILD 415* | (2) | Conservation Law |

8 f.48 5560705601101 Development Domain

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 Sainte-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 Sainte-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, Environment and Sustainability |
| 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 (12 credits)

| | | |
|----------|-----|----------------------------|
| ANTH 339 | (3) | Ecological Anthropology |
| ECON 313 | (3) | Economic Development 1 |
| ECON 314 | (3) | Economic Development 2 |
| 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:

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 |
| ENVB 305 | (3) | Population & Community Ecology |
| GEOG 305 | (3) | Soils and Environment |
| GEOG 322 | (3) | Environmental Hydrology |
| NUTR 403 | (3) | Nutrition in Society |
| NUTR 501 | (3) | Nutrition in Developing Countries |
| PARA 410 | (3) | Environment and Infection |

Social Sciences

6 credits from:

| | | |
|----------|-----|---|
| AGEC 333 | (3) | Resource Economics |
| AGEC 442 | (3) | Economics of International Agricultural Development |
| 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 |

| | | |
|----------|-----|---|
| ENVR 201 | (3) | Society, Environment and Sustainability |
| 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 (36 credits)

36 credits of complementary courses are selected as follows:

3 credits - Senior Research Project

3 credits - Statistics

30 credits - chosen from amongst 12 Areas of focus

Senior Research Project

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 |

Statistics:

One of:

| | | |
|----------|-----|--|
| AEMA 310 | (3) | Statistical Methods 1 |
| BIOL 373 | (3) | Biometry |
| GEOG 202 | (3) | Statistics and Spatial Analysis |
| MATH 203 | (3) | Principles of Statistics 1 |
| PSYC 204 | (3) | Introduction to Psychological Statistics |

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 Adviser.

Area 1: Population, Community, and Ecosystem Ecology

* Note: you may take BIOL 540 or ENVR 540, but not both; you may take BIOL 308 or ENVB 305, 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 |
| BIOL 331 | (3) | Ecology/Behaviour Field Course |
| BIOL 334 | (3) | Applied Tropical Ecology |
| BIOL 553 | (3) | Neotropical Environments |
| GEOG 495 | (3) | Field Studies - Physical Geography |
| GEOG 499 | (3) | Subarctic Field Studies |
| WILD 475 | (3) | Desert Ecology |

Area 4: Hydrology and Water Resources

* Note: you may take only one of: GEOG 322, BREE 217, or CIVE 323.

| | | |
|-----------|-----|----------------------------------|
| BREE 217* | (3) | Hydrology and Water Resources |
| CIVE 323* | (3) | Hydrology and Water Resources |
| 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 AGECE 200 or ECON 208, but not both.

| | | |
|------------|-----|---|
| AGECE 200* | (3) | Principles of Microeconomics |
| AGECE 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 |
| ECON 313 | (3) | Economic Development 1 |
| ECON 314 | (3) | Economic Development 2 |
| GEOG 408 | (3) | Geography of Development |
| GEOG 410 | (3) | Geography of Underdevelopment: Current Problems |
| POLI 227 | (3) | Developing Areas/Introduction |
| 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, and Thought

EDER 461

(3)

Society and Change

Introduction to History and Philosoph

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 Sainte-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 Sainte-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, Environment and Sustainability |
| 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 |

Ecology:

One of:

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

Statistics:

One of:

| | | |
|----------|-----|-----------------------|
| AEMA 310 | (3) | Statistical Methods 1 |
| BIOL 373 | (3) | Biometry |

Science, Policy, and Management:

9 credits are chosen from interface between science, policy, and management as follows:

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

| | | |
|-----------|-----|---|
| AGEC 200* | (3) | Principles of Microeconomics |
| AGRI 550 | (3) | Sustained Tropical Agriculture |
| ANTH 418 | (3) | Environment and Development |
| ECON 208* | (3) | Microeconomic Analysis and Applications |
| ECON 225 | (3) | Economics of the Environment |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 370 | (3) | Protected Areas |
| GEOG 380 | (3) | Adaptive Environmental Management |
| GEOG 408 | (3) | Geography of Development |
| GEOG 410 | (3) | Geography of Underdevelopment: Current Problems |

Field Courses

One of:

| | | |
|----------|-----|------------------------------------|
| AGRI 452 | (3) | Water Resources in Barbados |
| BIOL 331 | (3) | Ecology/Behaviour Field Course |
| BIOL 334 | (3) | Applied Tropical Ecology |
| BIOL 553 | (3) | Neotropical Environments |
| GEOG 495 | (3) | Field Studies - Physical Geography |
| GEOG 497 | (3) | Ecology of Coastal Waters |
| GEOG 499 | (3) | Subarctic Field Studies |
| WILD 475 | (3) | Desert Ecology |

General Scientific Principles

6 credits of general scientific principles selected from the following:

* Note: you may take ENVB 430 or GEOG 306, but not both.

(A second field course from the domain curriculum may also be taken.)

** Note: you may take BIOL 432 or ENVB 315, but not both.

| | | |
|------------|-----|-------------------------------------|
| BIOL 324 | (3) | Ecological Genetics |
| BIOL 341 | (3) | History of Life |
| BIOL 342 | (3) | Marine Biology |
| BIOL 432** | (3) | Limnology |
| BIOL 441 | (3) | Biological Oceanography |
| BIOL 505 | (3) | Diversity and Systematics Seminar |
| ENVB 313 | (3) | Phylogeny and Biogeography |
| ENVB 315** | (3) | Science of Inland Waters |
| ENVB 410 | (3) | Ecosystem Ecology |
| ENVB 430* | (3) | GIS for Natural Resource Management |
| ENVB 437 | (3) | Assessing Environmental Impact |
| GEOG 272 | (3) | Earth's Changing Surface |
| GEOG 306* | (3) | Raster Geo-Information Science |
| GEOG 321 | (3) | Climatic Environments |
| GEOG 322 | (3) | Environmental Hydrology |
| GEOG 350 | (3) | Ecological Biogeography |
| MICR 331 | (3) | Microbial Ecology |
| PLNT 460 | (3) | Plant Ecology |
| WILD 311 | (3) | Ethology |
| WILD 410 | (3) | Wildlife Ecology |
| WOOD 420 | (3) | Environmental Issues: Forestry |

Social Science:

One of:

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

| | | |
|-----------|-----|------------------------------------|
| AGEC 333 | (3) | Resource Economics |
| ANTH 339 | (3) | Ecological Anthropology |
| ANTH 416 | (3) | Environment/Development: Africa |
| ECON 326 | (3) | Ecological Economics |
| GEOG 404 | (3) | Environmental Management 2 |
| GEOG 498 | (3) | Humans in Tropical Environments |
| GEOG 510 | (3) | Humid Tropical Environments |
| URBP 520 | (3) | Globalization: Planning and Change |
| WILD 415* | (2) | Conservation Law |

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 |

LSCI 202 (3) Molecular Cell Biology

Genetics

BIOL 202 (3) Basic Genetics

LSCI 204 (3) Genetics

Molecular Biology

BIOL 200 (3) Molecular Biology

LSCI 211 (3) Biochemistry 1

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

MATH 203 (3) Principles of Statistics 1

Nutrition

* Note: NUTR 307 - Video conference Downtown and at the Macdonald campus

ANSC 330 (3) Fundamentals of Nutrition

NUTR 307* (3) Human Nutrition

Human Health:

| | | |
|----------|-----|-------------------------|
| 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

* Note: you may take BREE 217 or GEOG 322, but not both.

| | | |
|-----------|-----|-------------------------------|
| 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 |
| ENVB 437 | (3) | Assessing Environmental Impact |
| GEOG 302 | (3) | Environmental Management 1 |
| 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) | Biocontrol of Pest Insects |

Pollution Control and Manag

| | | |
|-----------|-----|------------------------------|
| ENVR 540* | (3) | Ecology of Species Invasions |
| MICR 331 | (3) | Microbial Ecology |
| PLNT 304 | (3) | Biology of Fungi |
| PLNT 460 | (3) | Plant Ecology |
| WILD 410 | (3) | Wildlife Ecology |

10.2.2 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.)- Major Environment - Ecological Determinants of Health - Population (63 credits)

The Population concentration in this domain is open only to students in the B.Sc.(Ag.Env.Sc.) Major Environment or B.Sc. Major Environment program.

This domain considers the interface between the environment and human well-being, with particular focus on the triad that ties human health to the environment

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 Environment

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

Health and Society

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

Toxicology

| | | |
|----------|-----|-----------------------------|
| ANSC 312 | (3) | Animal Health and Disease |
| NUTR 420 | (3) | Toxicology and Health Risks |
| PHAR 303 | (3) | Principles of Toxicology |

Biology

| | | |
|----------|-----|-----------------------------|
| BIOL 200 | (3) | Molecular Biology |
| BIOL 201 | (3) | Cell Biology and Metabolism |
| LSCI 211 | (3) | Biochemistry 1 |

Statistics

One of the following Statistics courses or equiv

| | | |
|-----------|-----|---------------------------------|
| BIOL 465 | (3) | Conservation Biology |
| BIOL 540* | (3) | Ecology of Species Invasions |
| BIOL 553 | (3) | Neotropical Environments |
| ENVB 410 | (3) | Ecosystem Ecology |
| ENVB 506 | (3) | Quantitative Methods in 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:

Techniques and Management

* Note: you may take ENVB 430 or GEOG 201, but not both.

| | | |
|-----------|-----|--------------------------------------|
| CHEE 230 | (3) | Environmental Aspects of Technology |
| ENVB 430* | (3) | GIS for Natural Resource Management |
| ENVB 437 | (3) | Assessing Environmental Impact |
| GEOG 201* | (3) | Introductory Geo-Information Science |
| 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 |

Nutrition and Agriculture

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.

| Adviser | Mentor |
|--|--|
| Ms. Kathy Roulet Email: kathyroulet@mcgill.ca Telephone: 514-398-4306 | Professor Pierre Dutilleul Email: pierre.dutilleul@mcgill.ca 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.

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)

| | | |
|----------|-----|------------------------------------|
| AEMA 403 | (3) | Environmetrics Stage |
| AEMA 414 | (3) | Temporal and Spatial Statistics 01 |

Domain - Complementary Courses (36 credits)

36 credits of complementary courses are selected as follows:

12 credits - Fundamentals

3 credits - Basic Environmental Science

6 credits - Statistics, one of two options

15 credits - List 1 and List 2

Fundamentals:

12 credits of Fundamentals, 4 695.12 Tm1m(12 credits - Fundlredits - Stat(Dol356 Tm(Only 5Fundlr 1edio695.12 Tm1m(12 4 695.Tm(virtals)Tj1 007Tm1m(12 4 69.

Statistics:

6 credits of Statistics are selected from one of the following two options.

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. Several Statistics courses overlap (especially with MATH 324) and cannot be taken together. These rules do not apply to B.Sc.(Ag.Env.Sc.) students.

Option 1

| | | |
|----------|-----|-------------|
| MATH 323 | (3) | Probability |
| MATH 324 | (3) | Statistics |

Option 2

One of:

| | | |
|----------|-----|-----------------------|
| AEMA 310 | (3) | Statistical Methods 1 |
| BIOL 373 | (3) | Biometry |

And one of:

| | | |
|----------|-----|-----------------------------|
| AEMA 411 | (3) | Experimental Designs 01 |
| CIVE 555 | (3) | Environmental Data Analysis |
| GEOG 351 | (3) | Quantitative Methods |
| SOCI 461 | (3) | Quantitative Data Analysis |

A total of 15 credits are chosen from the following two lists.

List 1

3 credits minimum of statistics and mathematics chosen from:

* Note: or equivalent courses to BREE 252 or BREE 319.

| | | |
|-----------|-----|--------------------------------------|
| BIOL 434 | (3) | Theoretical Ecology |
| BREE 252* | (3) | Computing for Engineers |
| BREE 319* | (3) | Engineering Mathematics |
| GEOG 501 | (3) | Modelling Environmental Systems |
| MATH 223 | (3) | Linear Algebra |
| MATH 326 | (3) | Nonlinear Dynamics and Chaos |
| MATH 423 | (3) | Regression and Analysis of Variance |
| MATH 447 | (3) | Introduction to Stochastic Processes |
| MATH 525 | (4) | Sampling Theory and Applications |
| SOCI 504 | (3) | Quantitative Methods 1 |
| SOCI 505 | (3) | Quantitative Methods 2 |
| SOCI 580 | (3) | Social Research Design and Practice |

List 2

3 credits minimum of environmental sciences chosen from:

| | | |
|----------|-----|-----------------------------|
| AGRI 452 | (3) | Water Resources in Barbados |
|----------|-----|-----------------------------|

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 2011-2012" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Ms. Kathy Roulet, the Program Adviser (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 corequisites 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 are taught at both McGill's Downtown campus and at the Macdonald campus in Sainte-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 Sainte-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, Environment and Sustainability |
| 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 (9 credits)

| | | |
|----------|-----|-------------------------|
| AEBI 210 | (3) | Organisms 1 |
| AGRI 210 | (3) | Agro-Ecological History |
| PLNT 300 | (3) | Cropping Systems |

Domain: Complementary Courses (33 credits)

33 credits of complementary courses selected as follows:

15 credits - Basic Sciences

12 credits - Applied Sciences

6 credits - Social Sciences/Humanities

Basic Sciences:

15 credits of Basic Sciences selected as follows:

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 |
| ENVB 437 | (3) | Assessing Environmental Impact |
| 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 |

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 programs.

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 subsidence 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 2011-2012" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Ms. Kathy Roulet, the Program Adviser (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 Sainte-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 Sainte-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, Environment and Sustainability |
| 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, GIS and Remote Sensing Techniques, 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:

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

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:

* Note: you may take BIOL 308 or ENVB 305, but not both.

Soil and

| | | |
|-----------|-----|-------------------------------------|
| 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 |
| ENVB 437 | (3) | Assessing Environmental Impact |
| ESYS 301 | (3) | Earth System Modelling |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 380 | (3) | Adaptive Environmental Management |
| GEOG 404 | (3) | Environmental Management 2 |
| 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 382 | (3) | Ecological Monitoring and Analysis |
| 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:

3-9 credits of advanced study of Particular Environments:

* Note: you may take BIOL 432 or ENVB 315, but not both.

| | | |
|-----------|-----|--|
| BIOL 432* | (3) | Limnology |
| ENVB 315* | (3) | Science of Inland Waters |
| ENVB 410 | (3) | Ecosystem Ecology Ecological Biogeography |

of natural resources can affect the capability of natural ecosystems to continue to supply human needs in perpetuity; and 5) the approaches and technologies required to monitor and analyze the dynamics of natural and managed ecosystems.

Program Prerequisites or Corequisites

All students in this program **MUST** take the following pre- or corequisite courses:

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

| | | |
|----------|-----|----------------------------|
| BIOL 112 | (3) | Cell and Molecular Biology |
| LSCI 211 | (3) | Biochemistry 1 |

One of the following chemistry 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 2011-2012" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Ms. Kathy Roulet, the Program Adviser (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, but does not include the domain prerequisites or corequisites 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 are taught at both McGill's Downtown campus and at the Macdonald campus in Sainte-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 Sainte-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, Environment and Sustainability |
| 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.

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:

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

Statistics

One of:

| | | |
|----------|-----|-----------------------|
| AEMA 310 | (3) | Statistical Methods 1 |
| BIOL 373 | (3) | Biometry |

GIS Methods

One of:

| | | |
|----------|-----|--------------------------------------|
| ENVB 430 | (3) | GIS for Natural Resource Management |
| GEOG 201 | (3) | Introductory Geo-Information Science |

Advanced Ecosystem Components:

6 credits of advanced iOhon & CC0h:1 0 0 1 78.46 262.63 TI96om 0 0 1 221.949 311.42 61544anced Neotorpna62 14.72anced W0 0 1 256.334 Tm.38 14.72anced ater

| | | |
|-----------|-----|-------------------------------|
| BREE 217* | (3) | Hydrology and Water Resources |
| ENVB 315* | (3) | Science of Inland Waters |
| ENVB 410 | (3) | Ecosystem Ecology |
| GEOG 322* | (3) | Environmental Hydrology |

Adviser

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Mentor

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Telephone: 514-398-6460

W

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

Domain:

| | | |
|----------|-----|---------------------------------|
| 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 |
| POLI 345 | (3) | International Organizations |
| POLI 466 | (3) | Public Policy Analysis |

| | | |
|-----------|-----|--|
| CHEM 297* | (1) | Introductory Analytical Chemistry Laboratory |
| CHEM 419* | (3) | Advances in Chemistry of Atmosphere |
| ENVB 430* | (3) | GIS for Natural Resource Management |
| 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 |

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 2011-2012" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Ms. Kathy Roulet, the Program Adviser (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 Sainte-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 Sainte-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, Environment and Sustainability |
| 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)

Note: 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 (12 credits)

ATOC 214 (3) Introduction: Physics of the Atmosphere

AT (3) Oceans, Weather and Climate

12 credits chosen from:

| | | |
|----------|-----|--------------------------------------|
| AGRI 435 | (3) | Soil and Water Quality Management |
| ATOC 309 | (3) | Weather Radars and Satellites |
| ATOC 568 | (3) | Ocean Physics |
| BREE 416 | (3) | Engineering for Land Development |
| CIVE 323 | (3) | Hydrology and Water Resources |
| EPSC 549 | (3) | Hydrogeology |
| GEOG 201 | (3) | Introductory Geo-Information Science |
| GEOG 308 | (3) | Principles of Remote Sensing |
| GEOG 537 | (3) | Advanced Fluvial Geomorphology |
| NRSC 510 | (3) | Agricultural Micrometeorology |
| URBP 520 | (3) | Globalization: Planning and Change |

And/or one of:

| | | |
|----------|-----|---------------------------------|
| AEMA 305 | (3) | Differential Equations |
| MATH 315 | (3) | Ordinary Differential Equations |

And/or one of:

| | | |
|----------|-----|----------------------------------|
| BREE 506 | (3) | Advances in Drainage Management |
| BREE 509 | (3) | Hydrologic Systems and Modelling |
| GEOG 522 | (3) | Advanced Environmental Hydrology |

And/or one of:

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

And/or one of:

| | | |
|----------|-----|-------------------------------------|
| ENVB 430 | (3) | GIS for Natural Resource Management |
| GEOG 306 | (3) | Raster Geo-Information Science |

List B:

6 credits chosen from:

* Note: you can take BIOL 432 or ENVB 315, but not both.

| | | |
|-----------|-----|--------------------------|
| BIOL 342 | (3) | Marine Biology |
| BIOL 432* | (3) | Limnology |
| BIOL 441 | (3) | Biological Oceanography |
| BIOL 465 | (3) | Conservation Biology |
| BIOL 553 | (3) | Neotropical Environments |
| ENVB 315* | (3) | Science of Inland Waters |
| GEOG 350 | (3) | Ecological Biogeography |
| GEOG 505 | (3) | Global Biogeochemistry |

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. \(A&E\) 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.

| Adviser | Mentor |
|--|--|
| Ms. Kathy Roulet Email: kathyroulet@mcgill.ca Telephone: 514-398-4306 | Professor Frédéric Fabry Email: frederic.fabry@mcgill.ca 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 by a host of environmental problems, many, if not most, involving the atmosphere. Some problems are of a local nature, such as air pollution in large urban centres, while others are global, or at least reach areas far removed from industrial activities.

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

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 (18 credits)

18 credits are selected from:

* Note: you may take ATOC 219 or CHEM 219, but not both.

ATOC 214 (3) Introduction: Physics of the Atmosphere
 ATOC 215 (3) Oceans, Weather and Climate
 ATOC 219* (3) Introduction to Atmospheric Chemistry
 ATOC 315 (3) Thermodynamics and Convection
 CHEM 219* (3) Introduction to Atmospheric Chemistry
 CHEM 307 (3) Analytical Chemistry of Pollutants
 GEOG 308 (3) Principles of Remote Sensing

Domain: Complementary Courses (21 credits)

21 credits of complementary courses are selected as follows:

6 credits - Analytical Chemistry/Calculus courses

3 credits - Statistics

9 credits - Math or Physical Science

3 credits - Social Science

Analytical Chemistry/Calculus:

One of:

AEMA 202 (3) Intermediate Calculus
 MATH 222 (3) Calculus 3

and 3 credits from:

Note: CHEM 287 and CHEM 297 must be taken together.

CHEM 287 (2) Introductory Analytical Chemistry
 CHEM 297 (1) Introductory Analytical Chemistry Laboratory
 FDSC 213 (3) Analytical Chemistry 1

Statistics:

3 credits of Statistics courses or equivalent from:

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

Math or Physical Science:

9 credits of Math or Physical Science (at least 6 credits of which are at the 300 level or above):

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

| | | |
|-----------|-----|-------------------------------|
| AEMA 305* | (3) | Differential Equations |
| ATOC 309 | (3) | Weather Radars and Satellites |

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 ENVB 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 |
| ENVB 437* | (3) | Assessing Environmental Impact |

List B:

12 credits from:

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| 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 |

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| EPSC 580 | (3) | Aqueous Geochemistry |
| EPSC 590 | (3) | Applied Geochemistry Seminar |
| GEOG 302 | (3) | Environmental Management 1 |
| GEOG 322 | (3) | Environmental Hydrology |
| SOIL 510 | (3) | Environmental Soil Chemistry |

12 Honours Program in Environment

Adviser

Ms. Kathy Roulet, MSE Program Adviser
 Email: kathyroulet@mcgill.ca
 Telephone: 514-398-4306

This Program is open only to students in the B.Sc. Major in Environment, B.Sc.(Ag.Env.Sc.) Major in Environment, B.A. Faculty Program in Environment, and the B.A. & Sc. Interfaculty Program in Environment.

The Honours Program in Environment offers students the opportunity to undertake a year-long research project in close association with a professor. Honours research provides excellent preparation for graduate studies, but is not required for such studies. The Honours in Environment adds 6 credits of research to the regular Environment program. Since the Honours research is carried out in the final year at the same time as the regular courses, it does not add to the length (duration) of the degree. Students simply have 6 fewer credits of electives. If, for some reason, students cannot complete the Honours requirements, they may still graduate with the regular Environment program.

12.1 Bachelor of Arts (B.A.) - Honours Environment (60 credits)

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

In addition, students must satisfy the following:

1. Students apply for the Honours program in March of their U2 year. See the Program Adviser 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 course (ENVR 495).
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.
5. Arts (B.A.) students in the Honours Environment program must also complete a minor concentration in an academic unit other than the McGill School of Environment. Please refer to the Faculty of Arts regulations on Honours programs found under "Faculty Degree Requirements", "About Program Requirements" and "Departmental Programs".

Students in the B.A. Honours programs complete the core and domain courses (54 credits) according to their chosen domain as well as the 6 credits of Honours required 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 Adviser.

Honours Required Courses (6 credits)

Note: you take either ENVR 495D1 and ENVR 495D2 (6 credits over consecutive terms) or ENVR 495N1 and ENVR 495N2 (6 credits over non-consecutive terms).

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| ENVR 495D1 | (3) | Honours Research |
| ENVR 495D2 | (3) | Honours Research |
| ENVR 495N1 | (3) | Honours Research |
| ENVR 495N2 | (3) | Honours Research |

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. See the Program Adviser 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 course (ENVR 495).
4. Students are required to achieve a minimum overall CGP

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 Adviser 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.

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

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Natural Sciences and Technology

* Note: you may take LSCI 230 or MIMM 211, but not both; you may take BIOL 432 or ENVB 315, but not both; you may take ENVB 430 or GEOG 201, but not both; you may take BREE 217 or GEOG 322, but not both.

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| AGRI 340 | (3) | Principles of Ecological Agriculture |
| AGRI 435 | (3) | Soil and Water Quality Management |
| | | Fundamentals of Population Genetics |

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| 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 |
| NRSC 510 | (3) | Agricultural Micrometeorology |
| NRSC 514 | (3) | Freshwater Ecosystems |
| P | (3) | Environment and Infection |

