Bieler School of Environment

Programs, Courses and University Regulations

2023-2024

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This publication provides guidance to prospects, applicants, students, faculty and staff.

1. McGill University reserves the right to make changes to the information contained in this online publication - including correcting errors, altering fees, schedules of admission, and credit requirements, and revising or cancelling particular courses or programs - without prior notice.
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3. Students are responsible for informing themselves of the University's procedures, policies and regulations, and the specific requirements associated with the degree, diploma, or certificate sought.
4. All students registered at McGill University are considered to have agreed to act in accordance with the University procedures, policies and regulations.
5. Although advice is readily available on request, the responsibility of selecting the appropriate courses for graduation must ultimately rest with the student.
6. Not all courses are offered every year and changes can be made after publication. Always check the Minerva Class Schedule link at https://horizon.mcgill.ca/pban1/bwckschd.p_disp_dyn_sched for the most up-to-date information on whether a course is offered.
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Note: Throughout this publication, "you" refers to students newly admitted, readmitted or returning to McGill.

Publication Information

Published by

Enrolment Services
McGill University
3415 McTavish Street
Montreal, Quebec, H3A 0C8
Canada

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1 About the Bieler School of Environment

McGill's Faculties of Agricultural and Environmental Sciences, Arts, and Science have forged a unique approach to the study of environment through the interfaculty, trans-disciplinary Bieler School of Environment. The growth of technology, globalising economies, and rapid increases 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 perturbations observed over the entire globe over the span of 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 Bieler School of Environment 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 Bieler 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 School 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.

The Bieler School of Environment focuses on four themes:

- Health in a Changing Environment
- Ecosystems, Biodiversity, and Conservation
- Citizens, Communities, Institutions, and the Environment
- Rethinking Social-Ecological Relationships

3 About the School (Undergraduate)

Previously known as the McGill School of Environment, the School was renamed in 2020, in recognition of a generous gift to McGill to further the interdisciplinary teaching, research, and experiential learning capacity for students in the School. For those wishing to pursue a career in environment, the Bieler School of Environment aims to stimulate a passion for life-long learning, confidence in questioning established norms, ingenuity and openness to new ideas, and the ability to communicate and contribute effectively in all situations. We believe that these goals are best achieved through opportunities to witness, experience, and participate in diverse academic approaches. We also believe that major research achievements emerge out of a dynamic, interactive community where dialogue occurs among engaged students, staff, and faculty from all disciplines. To these ends, we strive to achieve a fully integrated, transdisciplinary understanding of problems and solutions to the many and interdependent environmental crises in a manner that bridges the social sciences and humanities with the natural and applied sciences.

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

3.1 Location

For advising, contact:

Program Adviser, Ms. Kathy Roulet
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Telephone: 514-398-2827
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Macdonald Campus
Rowles House
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Sainte-Anne-de-Bellevue, Quebec H9X 3V9
Telephone: 514-398-7559
Fax: 514-398-7846

3.2 Administrative Officers

Administrative Officers	
Anja Geitmann	**Dean, Faculty of Agricultural and Environmental Sciences**
Lisa Shapiro	**Dean, Faculty of Arts**
R. Bruce Lennox	**Dean, Faculty of Science**
Frederic Fabry	**Director**
Christopher Barrington-Leigh	**Chair, Graduate Affairs**
Julia Freeman	**Chair, Undergraduate Affairs**
Kathryn Roulet	**Program Adviser**

3.3 Environment Faculty

Director

Frédéric Fabry

Professors

Elena Bennett, Iwao Hirose, Anthony Ricciardi

Associate Professors

Madhav Badami, Christopher Barrington-Leigh, Jeffrey Cardille, Frédéric Fabry, Nicolas Kosoy, Brian Leung, Kevin Manaugh, Raja Sengupta, Renée Sieber, Ismael Vaccaro

Assistant Professors

Amy Janzwood, Fiona Soper

Faculty Lecturers

Julia Freeman, Christie Lovat, Kathryn Roulet

Associate Members

Anthropology: John Galaty

Architecture, School of: Nik Luka

Atmospheric and Oceanic Sciences: Parisa Ariya

Biology: Lauren Chapman, Andrew Gonzalez, Irene Gregory-Eaves, Lars Iversen, Catherine Potvin

Bioresource Engineering: Jan Adamowski, Grant Clark, Mark Lefsrud, Chandra Madramootoo

Chemical Engineering: Nathalie Tufenkji, Viviane Yargeau

Chemistry: Christopher Barrett

Associate Members

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

Earth and Planetary Sciences: Nagissa Mahmoudi

Electrical and Computer Engineering: Geza Joos

Epidemiology, Biostatistics, and Occupational Health: Jill Baumgartner, Jonathan Chevrier

Equity, Ethics and Policy: Jill Baumgartner

Geography: Mette Bendixen, Yann le Polain de Waroux, Graham MacDonald, Thom Meredith, Brian Robinson, Nigel Roulet

History and Classical Studies: Daviken Studnicki-Gizbert

Human Nutrition, School of: Niladri Basu

Integrated Studies in Education: Blane Harvey

Languages, Literatures, and Cultures: Stephanie Posthumus

Law, Faculty of: Richard Gold, Richard Janda, Sebastien Jodoin

Natural Resource Sciences: Christopher Buddle, Brian Driscoll, Jessica Gillung, Gordon Hickey, Cynthia Kallenbach, Paul Thomassin

Plant Science: Caroline Begg, Pierre Dutilleul, Jaswinder Singh, Don Smith

Redpath Museum: David M. Green

Urban Planning, School of: Nik Luka

Adjunct Professor

Katia Opalka

4 Admission, Registration, and Regulations

Information concerning admission to the Bieler School of Environment and the regulations concerning the Environment programs is provided in these sections:

Admission, Registration, and Regulations

section 4.1: Admission

section 4.2: Degree Requirements

section 4.3: Important Information about Program Selection

section 4.4: Examination Regulations

section 4.5: Courses Outside the Student's 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 Bieler School of Environment 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 *mcgill.ca/applying*.

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 > Undergraduate > : Faculty Degree Requirements*.

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 > Undergraduate > : 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 > Undergraduate > About the Faculty of Agricultural and Environmental Sciences, including School of Human Nutrition (Undergraduate) > Faculty Information and Regulations > : Degree Requirements*.

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

To be eligible for the **Diploma in Environment**, you must fulfil all program requirements as specified in *section 7.8: Diploma in Environment*.

To be eligible for an **Honours** degree, you must fulfil all the faculty and program requirements as indicated in the *Honours and First Class Honours* section under your home faculty. In addition, you must fulfil the honours program requirements outlined in *section 7.6: Honours Program in Environment*.

To be eligible for a **Joint Honours** degree, you must fulfil all the faculty and program requirements as indicated by the Faculty of Arts in *University Regulations and Resources > Undergraduate > Graduation > Graduation Honours > : Honours and First-Class Honours for Faculties of Arts and Science (including B.A. & Sc.)*. In addition, you must fulfil the honours program requirements outlined in *section 7.7.1: Bachelor of Arts (B.A.) - Joint Honours Component Environment (36 credits)*.

4.3 Important Information about Program Selection

You must select a concentration in order to graduate. If you are unsure of the concentration that you want to pursue in U1, you may register in the **Major** or **Faculty Program in Environment** without picking a concentration. However, you must pick a concentration by your U2 year.

This section does not apply to students in the B.A. & Sc., minor, or diploma programs.

4.4 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.

For more information on the University regulations and procedures, see *University Regulations and Resources > Undergraduate > : Examinations: General Information*.

4.5 Courses Outside the Student's Faculty

Students in the School's 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 > Undergraduate > Faculty of Arts Degree Requirements > Course Requirements > : Programs Outside the Faculties of Arts or Science – For Arts Students*.
- Arts and Science students, see *Bachelor of Arts and Science Undergraduate > Degree Requirements > Course Requirements > : Courses Outside the Faculties of Arts and of Science*.
- Science students, see *Faculty of Science > Undergraduate > Faculty Degree Requirements > Course Requirements > : Courses Outside the Faculties of Arts and of Science*.
- Agricultural and Environmental Sciences students, see *Faculty of Agricultural & Environmental Sciences > Undergraduate > About the Faculty of Agricultural and Environmental Sciences, including School of Human Nutrition (Undergraduate) > Faculty Information and Regulations > : 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 *mcgill.ca/science/student/continuingstudents/bsc/outside*.
- Students in the Diploma of Environment follow the program as specified; see *section 7.8: Diploma in Environment*.

5 Overview of Programs Offered

The Bieler School of Environment offers nine programs on the Downtown and Macdonald Campuses:

1. A **Minor in Environment** is open to all undergraduate students. For more information, see *section 7.1: 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 7.2: 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 7.3: Bachelor of Arts and Science (B.A. & Sc.) – Interfaculty Programs*.
4. An **Interfaculty Program in Sustainability, Science and Society** leading to a B.A. and Sc. is offered by the Bieler 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 > Undergraduate > : 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 7.4: 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 7.4: 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 7.6: Honours Program in Environment*.
8. A **Joint Honours Program in Environment** is open to senior Environment students in the B.A. degree. For more information, see *section 7.7.1: Bachelor of Arts (B.A.) - Joint Honours Component Environment (36 credits)*.
9. 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 7.8: Diploma in Environment*.

These programs strive to offer the flexibility necessary to deal with the environment through a set of core courses that provide the general knowledge base of the program combined with a progressive series of courses in a transdisciplinary concentration of environmental specialization.

The programs are designed to prepare students for further study in environment or discipline-based graduate programs, and for employment in industry, government, and education.

6 Suggested Courses for Freshman Students

In general, the Downtown Campus offerings (section -001) of ENVR courses are restricted to students in U1 and above. Where course capacity allows, Freshman (U0) students are allowed to take the Macdonald Campus offerings (section -051) of the 200-level ENVR courses. Students in their U1 to U3 years are welcome to take selected ENVR courses even if they are not in the Environment programs where space permits. 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/undergraduate/handbook#bsc-program-specific-advice*.
- Students in the **B.Sc.(Ag.Env.Sc.)** degree, see *mcgill.ca/macdonald/prospective/freshmanyear/academics*.
- Students in the **B.A. & Sc.** degree, see *www.mcgill.ca/science/undergraduate/handbook#basc-program-specific-advice*.
- Students in the **B.A.** degree, see *www.mcgill.ca/oasis/students/new*.

7 Browse Academic Programs

The programs and courses in the following sections have been approved for the 2023-2024 academic year as listed.

7.1 Minor in Environment

The Minor in Environment is intended to complement an expertise obtained through a major, major concentration, Faculty program, or Interfaculty program offered by an academic unit **other than** the Bieler School of Environment*****. Students taking the Minor (or Minor Concentration) 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 Environment Program Adviser, can declare their intention to do a Minor (or Minor Concentration) in Environment.

*** Note:** Students in Arts, Law, and Management should complete the **Minor Concentration Environment**. Students in Agricultural and Environmental Sciences, Engineering, and Science should complete the **Minor Environment**.

7.1.1 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, Law and Management students. Students in Agricultural & Environmental Sciences, Engineering, and Science should complete the Minor Environment.

Advising Note:

Consultation with the Program Adviser for approval of course selection to meet program requirements is obligatory. No overlap is allowed between this program and the student's major program or concentration, or a second minor program.

For more information, contact:

Ms. Kathy Roulet, Program Adviser

Email: kathy.roulet@mcgill.ca

Telephone: 514-398-4306

Complementary Courses (18 credits)

18 credits of complementary courses, all of which must fall outside the discipline or field of the student's major program or concentration, and which must be 200-level or above, selected as follows:

12 credits of MSE core courses:

The core ENVR courses are taught at 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, Environment and Sustainability
ENVR 202	(3)	The Evolving Earth
ENVR 203	(3)	Knowledge, Ethics and Environment
ENVR 400	(3)	Environmental Thought

6 credits of environmentally related courses selected with the approval of the Program Adviser (at least 3 credits must be in natural sciences). A list of Suggested Courses is given below.

Suggested Course List

The Suggested Course 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 exhaustive. You are 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 Course List may be included with the permission of the Program Adviser.

Some courses on the Suggested Course List may be subject to other regulations (e.g., the Restricted Courses List for Faculty of Science students. If in doubt, ask the Program Adviser.

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.

Social Sciences and Policy

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 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 418	(3)	Environment and Development
ANTH 512	(3)	Political Ecology
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
EDER 494	(3)	Human Rights and Ethics in Practice
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
ENVR 421	(3)	Montreal: Environmental History and Sustainability
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 310	(3)	Development and Livelihoods
GEOG 370	(3)	Protected Areas
GEOG 403	(3)	Global Health and Environmental Change
GEOG 408	(3)	Geography of Development
GEOG 423	(3)	Dilemmas of Development
GEOG 530	(3)	Global Land and Water Resources
HIST 249	(3)	Health and the Healer in Western History
HIST 292	(3)	History and the Environment
NRSC 221	(3)	Environment and Health
PHIL 221	(3)	Introduction to History and Philosophy of Science 2
PHIL 230	(3)	Introduction to Moral Philosophy 1
PHIL 237	(3)	Contemporary Moral Issues
PHIL 334	(3)	Ethical Theory
PHIL 341	(3)	Philosophy of Science 1
PHIL 343	(3)	Biomedical Ethics
PHIL 348	(3)	Philosophy of Law 1
POLI 212	(3)	Government and Politics - Developed World

POLI 227	(3)	Developing Areas/Introduction
POLI 345	(3)	International Organizations
POLI 350	(3)	Global Environmental Politics
POLI 412	(3)	Canadian Voting/Public Opinion
POLI 445	(3)	International Political Economy: Monetary Relations
POLI 474	(3)	Inequality and Development
PSYC 215	(3)	Social Psychology
RELG 270	(3)	Religious Ethics and the Environment
RELG 370	(3)	Religion and Human Rights
SOCI 222	(3)	Urban Sociology
SOCI 234	(3)	Population and Society
SOCI 235	(3)	Technology and Society
SOCI 254	(3)	Development and Underdevelopment
SOCI 307	(3)	Globalization
SOCI 365	(3)	Health and Development
SOCI 366	(3)	Neighborhoods and Inequality
SOCI 386	(3)	Contemporary Social Movements
URBP 201	(3)	Planning the 21st Century City
URBP 504	(3)	Planning for Active Transportation
URBP 506	(3)	Environmental Policy and Planning
URBP 530	(3)	Urban Infrastructure and Services in International Context
URBP 551	(3)	Urban Design and Planning
WCOM 314	(3)	Communicating Science

Natural Sciences and Technology

** Note: you may take LSCI 230 or MIMM 211, but not both; you may take ENVB 529 or GEOG 201, but not both; you may take one of BREE 217, CIVE 323 or GEOG 322; you may take BIOL 308 or ENVB 305, but not both; you may take BIOL 465 or WILD 421, but not both; you make take COMP 202 or COMP 204, but not both; you may take EPSC 201 or EPSC 233, but not both.

AGRI 340	(3)	Principles of Ecological Agriculture
ANSC 326	(3)	Fundamentals of Population Genetics
ANTH 311	(3)	Primate Behaviour and Ecology
ATOC 214	(3)	Introduction: Physics of the Atmosphere
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)	Global Change Biology of Aquatic Ecosystems
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 327	(3)	Bio-Environmental Engineering
BREE 518	(3)	Ecological Engineering
CHEM 212	(4)	Introductory Organic Chemistry 1
CHEM 281	(3)	Inorganic Chemistry 1
CIVE 225	(4)	Environmental Engineering
CIVE 323**	(3)	Hydrology and Water Resources
CIVE 550	(3)	Water Resources Management
COMP 202**	(3)	Foundations of Programming
COMP 204**	(3)	Computer Programming for Life Sciences
ENVB 210	(3)	The Biophysical Environment
ENVB 301	(3)	Meteorology
ENVB 305**	(3)	Population and Community Ecology
ENVB 410	(3)	Ecosystem Ecology
ENVB 415	(3)	Ecosystem Management
ENVB 529**	(3)	GIS for Natural Resource Management
ENVR 200	(3)	The Global Environment
ENVR 202	(3)	The Evolving Earth
ENVR 422	(3)	Montreal Urban Sustainability Analysis
EPSC 201**	(3)	Understanding Planet Earth
EPSC 233**	(3)	Earth and Life History
EPSC 549	(3)	Hydrogeology
ESYS 301	(3)	Earth System Modelling
FDSC 230	(4)	Organic Chemistry
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)	Remote Sensing for Earth Observation
GEOG 321	(3)	Climatic Environments
GEOG 322**	(3)	Environmental Hydrology
GEOG 372	(3)	Running Water Environments
GEOG 470	(3)	Wetlands
GEOG 550	(3)	Historical Ecology Techniques
LSCI 230**	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology
MIME 320	(3)	Extraction of Energy Resources
MIMM 211**	(3)	Introductory Microbiology
MIMM 214	(3)	Introductory Immunology: Elements of Immunity
MIMM 323	(3)	Microbial Physiology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation

PHYS 228	(3)	Energy and the Environment
PLNT 304	(3)	Biology of Fungi
PLNT 305	(3)	Plant Pathology
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
WILD 302	(3)	Fish Ecology
WILD 421**	(3)	Wildlife Conservation

7.1.2 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Minor Environment (18 credits)

This 18-credit Minor is intended for Faculty of Agricultural and Environmental Science students and Faculty of Science students, but is open to students from other faculties as well, except Arts, Law and Management. Students in Arts, Law and Management should complete the Minor Concentration Environment.

Advising Note:

Consultation with the Program Adviser for approval of course selection to meet program requirements is obligatory. No overlap is allowed between this program and the student's major program or concentration, or a second minor program.

For more information, contact:

Ms Kathy Roulet, Program Adviser

Email: Kathy.roulet@mcgill.ca

Telephone: 514-398-4306

Complementary Courses (18 credits)

18 credits of complementary courses, all of which must fall outside the discipline or field of the student's major program or concentration, and which must be 200-level or above, selected as follows:

12 credits of Bieler School of Environment core courses:

The core courses are taught at 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, Environment and Sustainability
ENVR 202	(3)	The Evolving Earth
ENVR 203	(3)	Knowledge, Ethics and Environment
ENVR 400	(3)	Environmental Thought

6 credits of environmentally related courses selected with the approval of the Program Adviser (at least 3 credits must be in social sciences). A list of Suggested Courses is given below.

Suggested Course List

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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 exhaustive. You are 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 Course List may be included with the permission of the Bieler School of Environment Program Adviser.

Some courses on the Suggested Course List may be subject to other regulations (e.g., the Restricted Courses List for Faculty of Science students). If in doubt, ask the Program Adviser.

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.

Social Sciences and Policy

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 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 418	(3)	Environment and Development
ANTH 512	(3)	Political Ecology
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
EDER 494	(3)	Human Rights and Ethics in Practice
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
ENVR 421	(3)	Montreal: Environmental History and Sustainability
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 310	(3)	Development and Livelihoods
GEOG 370	(3)	Protected Areas
GEOG 403	(3)	Global Health and Environmental Change
GEOG 408	(3)	Geography of Development
GEOG 423	(3)	Dilemmas of Development
GEOG 530	(3)	Global Land and Water Resources
HIST 249	(3)	Health and the Healer in Western History
HIST 292	(3)	History and the Environment
NRSC 221	(3)	Environment and Health
PHIL 221	(3)	Introduction to History and Philosophy of Science 2
PHIL 230	(3)	Introduction to Moral Philosophy 1
PHIL 237	(3)	Contemporary Moral Issues

PHIL 334	(3)	Ethical Theory
PHIL 341	(3)	Philosophy of Science 1
PHIL 343	(3)	Biomedical Ethics
PHIL 348	(3)	Philosophy of Law 1
POLI 212	(3)	Government and Politics - Developed World
POLI 227	(3)	Developing Areas/Introduction
POLI 345	(3)	International Organizations
POLI 350	(3)	Global Environmental Politics
POLI 412	(3)	Canadian Voting/Public Opinion
POLI 445	(3)	International Political Economy: Monetary Relations
POLI 474	(3)	Inequality and Development
PSYC 215	(3)	Social Psychology
RELG 270	(3)	Religious Ethics and the Environment
RELG 370	(3)	Religion and Human Rights
SOCI 222	(3)	Urban Sociology
SOCI 234	(3)	Population and Society
SOCI 235	(3)	Technology and Society
SOCI 254	(3)	Development and Underdevelopment
SOCI 307	(3)	Globalization
SOCI 365	(3)	Health and Development
SOCI 366	(3)	Neighborhoods and Inequality
SOCI 386	(3)	Contemporary Social Movements
URBP 201	(3)	Planning the 21st Century City
URBP 504	(3)	Planning for Active Transportation
URBP 506	(3)	Environmental Policy and Planning
URBP 530	(3)	Urban Infrastructure and Services in International Context
URBP 551	(3)	Urban Design and Planning
WCOM 314	(3)	Communicating Science

Natural Sciences and Technology

** Note: you may take LSCI 230 or MIMM 211, but not both: you may take ENVB 529 or GEOG 201, but not both: you make take one of BREE 217, CIVE 323 or GEOG 322: you may take BIOL 308 or ENVB 305, but not both: you may take BIOL 465 or WILD 421, but not both: you may take COMP 202 or COMP 204, but not both: you may take EPSC 201 or EPSC 233, but not both.

AGRI 340	(3)	Principles of Ecological Agriculture
ANSC 326	(3)	Fundamentals of Population Genetics
ANTH 311	(3)	Primate Behaviour and Ecology
ATOC 214	(3)	Introduction: Physics of the Atmosphere
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)	Global Change Biology of Aquatic Ecosystems

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 327	(3)	Bio-Environmental Engineering
BREE 518	(3)	Ecological Engineering
CHEM 212	(4)	Introductory Organic Chemistry 1
CHEM 281	(3)	Inorganic Chemistry 1
CIVE 225	(4)	Environmental Engineering
CIVE 323**	(3)	Hydrology and Water Resources
CIVE 550	(3)	Water Resources Management
COMP 202**	(3)	Foundations of Programming
COMP 204**	(3)	Computer Programming for Life Sciences
ENVB 210	(3)	The Biophysical Environment
ENVB 301	(3)	Meteorology
ENVB 305**	(3)	Population and Community Ecology
ENVB 410	(3)	Ecosystem Ecology
ENVB 415	(3)	Ecosystem Management
ENVB 529**	(3)	GIS for Natural Resource Management
ENVR 200	(3)	The Global Environment
ENVR 202	(3)	The Evolving Earth
ENVR 422	(3)	Montreal Urban Sustainability Analysis
EPSC 201**	(3)	Understanding Planet Earth
EPSC 233**	(3)	Earth and Life History
EPSC 549	(3)	Hydrogeology
ESYS 301	(3)	Earth System Modelling
FDSC 230	(4)	Organic Chemistry
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)	Remote Sensing for Earth Observation
GEOG 321	(3)	Climatic Environments
GEOG 322**	(3)	Environmental Hydrology
GEOG 372	(3)	Running Water Environments
GEOG 470	(3)	Wetlands
GEOG 550	(3)	Historical Ecology Techniques
LSCI 230**	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology
MIME 320	(3)	Extraction of Energy Resources
MIMM 211**	(3)	Introductory Microbiology

MIMM 214	(3)	Introductory Immunology: Elements of Immunity
MIMM 323	(3)	Microbial Physiology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation
PHYS 228	(3)	Energy and the Environment
PLNT 304	(3)	Biology of Fungi
PLNT 305	(3)	Plant Pathology
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
WILD 302	(3)	Fish Ecology
WILD 421**	(3)	Wildlife Conservation

7.2 B.A. Faculty Program in Environment

The B.A. Faculty Program comprises two course components: core and concentration.

Core: In the core component, the four introductory courses and an intermediate-level course expose students to different interdisciplinary perspectives, approaches, and world views to help them understand the complexity and conflicts that underlie most environmental problems. In the two senior-level courses of the core component, students will apply the general and specialized knowledge acquired through the rest of their program, to the analysis of a selection of contemporary environmental problems. Students will be challenged by the core program to look beyond the confines of their individual views of environment.

Concentration: In addition to the core program, students choose a concentration, a transdisciplinary study of a particular theme or component of the environment. The requirements and complementary course sets vary between concentrations. You can choose to follow one of three concentrations within the B.A. Faculty Program in Environment:

- Ecological Determinants of Health in Society
- Economics and the Earth's Environment
- Environment and Development

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

To obtain a B.A. Faculty Program in Environment, students must:

- register in a concentration online, using Minerva;
- satisfy the co- and/or prerequisites for the program (Numeracy [e.g., calculus] and a Basic Science course);
- pass all courses counted towards the Faculty Program with **a grade of C or higher**;
- confirm that their course selection satisfies the required components of the core and their chosen concentration, and that the complementary courses are approved courses in their chosen concentration; and
- fulfil all Faculty requirements as specified for the B.A. in *Faculty of Arts* > *Undergraduate* > *: Faculty Degree Requirements*, which include meeting the minimum credit requirement as specified in their letter of admission.

7.2.1 Ecological Determinants of Health in Society Concentration

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

7.2.1.1 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

To graduate from the Faculty Program in Environment, students are required to complete these courses by the end of their U1 year. These courses can be taken using the Satisfactory/Unsatisfactory option. See: http://www.mcgill.ca/study/university_regulations_and_resources/undergraduate/gi_courses_taken_under_the_satisfactory_unsatisfactory_option for details.

Numeracy

3 credits 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 "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), or contact Kathy Roulet, the Program Adviser (kathy.roulet@mcgill.ca).

Program Requirements

Note: You 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 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 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.

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

Complementary Courses (33 credits)

33 credits of complementary courses are chosen as follows:

6 credits of Health and Environment

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

9 credits from List A

6 credits from List B

Health and Environment

GEOG 221*	(3)	Environment and Health
GEOG 303	(3)	Health Geography
NRSC 221*	(3)	Environment and Health

* Students take either GEOG 221 or NRSC 221, but not both.

Fundamentals: (12 credits)

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

Health and Infection

GEOG 403	(3)	Global Health and Environmental Change
GEOG 493	(3)	Health and Environment in Africa
GEOG 503	(3)	Advanced Topics in Health Geography
PARA 410	(3)	Environment and Infection
PPHS 529	(3)	Global Environmental Health and Burden of Disease

Economics

AGEC 200	(3)	Principles of Microeconomics
ECON 208	(3)	Microeconomic Analysis and Applications
ECON 225	(3)	Economics of the Environment

Nutrition

EDKP 292	(3)	Nutrition and Wellness
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. You 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
SOCI 350	(3)	Statistics in Social Research

List A:

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

Health and Society

SOCI 225	(3)	Medicine and Health in Modern Society
SOCI 234	(3)	Population and Society
SOCI 309	(3)	Health and Illness
SOCI 331	(3)	Population and Environment

SOCI 515	(3)	Medicine and Society

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

Agriculture

AEBI 425	(3)	Tropical Energy and Food
AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
AGRI 550	(3)	Sustained Tropical Agriculture
NUTR 341	(3)	Global Food Security

Decision Making

AGEC 333	(3)	Resource Economics
ECON 440	(3)	Health Economics
PHIL 343	(3)	Biomedical Ethics
RELG 270	(3)	Religious Ethics and the Environment
URBP 507	(3)	Planning and Infrastructure

Biology Fundamentals:

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

AEBI 210	(3)	Organisms 1
AEBI 211	(3)	Organisms 2
BIOL 200	(3)	Molecular Biology
BIOL 308*	(3)	Ecological Dynamics
ENVB 305*	(3)	Population and Community Ecology
LSCI 211	(3)	Biochemistry 1

Development and Ecology

ANTH 212	(3)	Anthropology of Development
ANTH 339	(3)	Ecological Anthropology
ANTH 512	(3)	Political Ecology
ENVR 421	(3)	Montreal: Environmental History and Sustainability
GEOG 300	(3)	Human Ecology in Geography
GEOG 310	(3)	Development and Livelihoods
SOCI 254	(3)	Development and Underdevelopment
SOCI 365	(3)	Health and Development

List B:

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

Advanced Ecology

* Note: You may take BIOL 451 or NRSC 451, but not both.

AEBI 421	(3)	Tropical Horticultural Ecology
BIOL 451*	(3)	Research in Ecology and Development in Africa
BIOL 465	(3)	Conservation Biology
BIOL 553	(3)	Neotropical Environments
ENVB 410	(3)	Ecosystem Ecology
ENVB 500	(3)	Advanced Topics in Ecotoxicology
NRSC 451*	(3)	Research in Ecology and Development in Africa

Pollution Control and Pest Management

ENTO 350	(3)	Insect Biology and Control
ENTO 352	(3)	Biocontrol of Pest Insects
NRSC 333	(3)	Pollution and Bioremediation
PARA 515	(3)	Water, Health and Sanitation

Techniques and Management

* Note: You may take ENVB 529 or GEOG 201, but not both.

AEBI 423	(3)	Sustainable Land Use
ENVB 529*	(3)	GIS for Natural Resource Management
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 302	(3)	Environmental Management 1
GEOG 404	(3)	Environmental Management 2
WILD 421	(3)	Wildlife Conservation

or, advanced quantitative methods course (with approval of Adviser).

Social Change and Influences

ANTH 227	(3)	Medical Anthropology
ENVR 430	(3)	The Economics of Well-Being
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 406	(3)	Human Dimensions of Climate Change
GEOG 514	(3)	Climate Change Vulnerability and Adaptation
HIST 249	(3)	Health and the Healer in Western History
SOCI 307	(3)	Globalization

Immunology and Infectious Disease

* Note: You may take MIMM 413 or WILD 424, but not both.

MIMM 214	(3)	Introductory Immunology: Elements of Immunity

MIMM 314	(3)	Intermediate Immunology
MIMM 324	(3)	Fundamental Virology
MIMM 413*	(3)	Parasitology
PARA 424*	(3)	Fundamental Parasitology
PARA 438	(3)	Immunology
PPHS 501	(3)	Population Health and Epidemiology

Populations and Place

* Note: You may take ANTH 451 or GEOG 451, but not both.

ANTH 451*	(3)	Research in Society and Development in Africa
EDKP 204	(3)	Health Education
GEOG 451*	(3)	Research in Society and Development in Africa
GEOG 498	(3)	Humans in Tropical Environments
HIST 335	(3)	Science and Medicine in Canada
HIST 510	(3)	Environmental History of Latin America (Field)
SOCI 520	(3)	Migration and Immigrant Groups
SOCI 525	(3)	Health Care Systems in Comparative Perspective
SOCI 550	(3)	Developing Societies

7.2.2 Economics and the Earth’s Environment Concentration

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

7.2.2.1 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

To graduate from the Faculty Program in Environment, students are required to complete these courses by the end of their U1 year. These courses can be taken using the Satisfactory/Unsatisfactory option. See:
http://www.mcgill.ca/study/university_regulations_and_resources/undergraduate/gi_courses_taken_under_the_satisfactory_unsatisfactory_option for details.

Numeracy

3 credits, 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 Chemistry OOUL):

AECH 110	(4)	General Chemistry 1

CHEM 110	(4)	General Chemistry 1

Other Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), 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 program pre-requisites or co-requisites 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.

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

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 240	(3)	Geology in the Field

Domain: Complementary Courses (18 credits)

18 credits are selected from various categories as follows:

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

Economics

6 credits from:

AGEC 333	(3)	Resource Economics
ECON 209	(3)	Macroeconomic Analysis and Applications
ECON 326	(3)	Ecological Economics
ECON 347	(3)	Economics of Climate Change
ECON 416	(3)	Topics in Economic Development 2
ECON 511	(3)	Energy, Economy and Environment

Advanced Courses (9 credits)

9 credits chosen from two areas:

Area 1: Development/Environmental Management

* Note: You can take ENVB 529 or GEOG 201 but not both; you can take BIOL 451 or NRSC 451 but not both; you can take ANTH 451 or GEOG 451 but not both.

AEBI 423	(3)	Sustainable Land Use
AGRI 550	(3)	Sustained Tropical Agriculture
ANTH 451*	(3)	Research in Society and Development in Africa
BIOL 451*	(3)	Research in Ecology and Development in Africa
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
ENVB 437	(3)	Assessing Environmental Impact
ENVB 529*	(3)	GIS for Natural Resource Management
ENVR 421	(3)	Montreal: Environmental History and Sustainability
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 302	(3)	Environmental Management 1
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 404	(3)	Environmental Management 2
GEOG 451*	(3)	Research in Society and Development in Africa
GEOG 498	(3)	Humans in Tropical Environments
HIST 510	(3)	Environmental History of Latin America (Field)
MIME 320	(3)	Extraction of Energy Resources
NRSC 451*	(3)	Research in Ecology and Development in Africa
URBP 507	(3)	Planning and Infrastructure

Area 2: Environmental Resources

* Note: You can take BREE 217 or GEOG 322 but not both; you can take BIOL 308 or ENVB 305 but not both.

ATOC 341	(3)	Caribbean Climate and Weather
BIOL 308*	(3)	Ecological Dynamics
BIOL 343	(3)	Biodiversity in the Caribean
BREE 217*	(3)	Hydrology and Water Resources
ENVB 305*	(3)	Population and Community Ecology
EPSC 355	(3)	Sedimentary Geology
EPSC 549	(3)	Hydrogeology
GEOG 305	(3)	Soils and Environment
GEOG 322*	(3)	Environmental Hydrology
SOIL 300	(3)	Geosystems

7.2.3 Environment and Development Concentration

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

7.2.3.1 Bachelor of Arts (B.A.) - Faculty Program Environment - Environment and Development (54 credits)

The quest for sustainable paths to economic development requires scholars and practitioners to transcend the boundaries of traditional disciplines. This domain offers students sufficient depth and breadth of study to acquire a strong grasp of current theories, concepts, and approaches to environment and development. It prepares them for graduate study in interdisciplinary programs (e.g., development studies or environmental studies) as well as in integrative social sciences (e.g., anthropology, geography, etc.).

Program Prerequisites or Corequisites

To graduate from the Faculty Program in Environment, students are required to complete these courses by the end of their U1 year. These courses can be taken using the Satisfactory/Unsatisfactory option. See: http://www.mcgill.ca/study/university_regulations_and_resources/undergraduate/gi_courses_taken_under_the_satisfactory_unsatisfactory_option for details.

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 "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), 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 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 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.

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

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 categories 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
AGRI 411	(3)	Global Issues on Development, Food and Agriculture

ANTH 418	(3)	Environment and Development
GEOG 310	(3)	Development and Livelihoods
GEOG 408	(3)	Geography of Development
GEOG 409	(3)	Geographies of Developing Asia
GEOG 410	(3)	Geography of Underdevelopment: Current Problems
URBP 520	(3)	Globalization: Planning and Change

Natural Sciences

3 credits from:

* Note: You may take BIOL 308 or ENVB 305 but not both; you may take BIOL 465 or WILD 421 but not both; you may take ENVB 210 or GEOG 305 but not both; you may take BREE 217 or GEOG 322 but not both.

AEBI 421	(3)	Tropical Horticultural Ecology
AGRI 550	(3)	Sustained Tropical Agriculture
ATOC 341	(3)	Caribbean Climate and Weather
BIOL 308*	(3)	Ecological Dynamics
BIOL 343	(3)	Biodiversity in the Caribean
BIOL 451	(3)	Research in Ecology and Development in Africa
BIOL 465*	(3)	Conservation Biology
BIOL 553	(3)	Neotropical Environments
BREE 217*	(3)	Hydrology and Water Resources
ENVB 210*	(3)	The Biophysical Environment
ENVB 305	(3)	Population and Community Ecology
GEOG 305*	(3)	Soils and Environment
GEOG 322*	(3)	Environmental Hydrology
NRSC 451	(3)	Research in Ecology and Development in Africa
NUTR 501	(3)	Nutrition in Developing Countries
NUTR 505	(3)	Public Health Nutrition
PARA 410	(3)	Environment and Infection
WILD 421*	(3)	Wildlife Conservation

Social Sciences

6 credits from:

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

AEBI 423	(3)	Sustainable Land Use
AEBI 425	(3)	Tropical Energy and Food
AGEC 333	(3)	Resource Economics
AGRI 452	(3)	Water Resources in Barbados
ANTH 451	(3)	Research in Society and Development in Africa
ECON 326	(3)	Ecological Economics
ECON 347	(3)	Economics of Climate Change
ECON 405	(3)	Natural Resource Economics
ENVR 421	(3)	Montreal: Environmental History and Sustainability
ENVR 422	(3)	Montreal Urban Sustainability Analysis

GEOG 201	(3)	Introductory Geo-Information Science
GEOG 221	(3)	Environment and Health
GEOG 300	(3)	Human Ecology in Geography
GEOG 311	(3)	Economic Geography
GEOG 331	(3)	Urban Social Geography
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 404	(3)	Environmental Management 2
GEOG 406	(3)	Human Dimensions of Climate Change
GEOG 416	(3)	Africa South of the Sahara
GEOG 451	(3)	Research in Society and Development in Africa
GEOG 496	(3)	Geographical Excursion
GEOG 498	(3)	Humans in Tropical Environments
GEOG 510	(3)	Humid Tropical Environments
GEOG 514	(3)	Climate Change Vulnerability and Adaptation
HIST 510	(3)	Environmental History of Latin America (Field)
INTD 360	(3)	Environmental Challenges in Development
MGPO 440	(3)	Strategies for Sustainability
NRSC 221*	(3)	Environment and Health
POLI 445	(3)	International Political Economy: Monetary Relations

7.3 Bachelor of Arts and Science (B.A. & Sc.) – Interfaculty Programs

These Interfaculty Programs are open only to students in the B.A. & Sc. degree.

To obtain a **B.A. & Sc. Interfaculty Program in Environment** or a **B.A. & Sc. Interfaculty Program in Sustainability, Science and Society**, students must:

- register in the Interfaculty Program online, using Minerva;
- pass all courses counted toward the Interfaculty Program with a grade of C or higher;
- confirm that their course selection satisfies the required and complementary course components of the program;
- fulfil all requirements specified for the B.A. & Sc. in *Bachelor of Arts & Science* > *Undergraduate* > *: Degree Requirements*, which include meeting the minimum credit requirement as specified in their letter of admission.

Adviser – ***section 7.3.1: Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program Environment (54 credits)***

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

Adviser – ***: Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Sustainability, Science and Society (54 credits)***

Michelle Maillet
Email: *advisor.geog@mcgill.ca*

7.3.1 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 face the myriad of environmental problems that currently need to be addressed.

Program Requirements

1. Students are required to take a maximum of 21 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes required courses.

2. Students must complete at least 21 credits in the Faculty of Arts and at least 21 in the Faculty of Science as part of their interfaculty program and their minor or minor concentration. ENVR courses are considered courses in both Arts and Science, and so the credits are split between the two faculties for the purpose of this regulation.

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 on both McGill's Downtown campus and at the Macdonald campus in Sainte-Anne-de-Bellevue.

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

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.

ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

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 three 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 and Community Ecology
ENVB 410	(3)	Ecosystem Ecology
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVR 540*	(3)	Ecology of Species Invasions
GEOG 350	(3)	Ecological Biogeography
PLNT 460	(3)	Plant Ecology

Area 2: Biodiversity and Conservation

BIOL 305	(3)	Animal Diversity
BIOL 343	(3)	Biodiversity in the Caribean
BIOL 355	(3)	Trees: Ecology and Evolution
BIOL 427	(3)	Herpetology
BIOL 465	(3)	Conservation Biology
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 334D1	(1.5)	Applied Tropical Ecology
BIOL 334D2	(1.5)	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 537	(3)	Advanced Fluvial Geomorphology

Area 5: Human Health

NUTR 307	(3)	Metabolism and Human Nutrition
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
ATOC 341	(3)	Caribbean Climate and Weather
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
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

Area 9: Cultures and People

ANTH 206	(3)	Environment and Culture
ANTH 339	(3)	Ecological Anthropology
ENVR 421	(3)	Montreal: Environmental History and Sustainability
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
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 370	(3)	Religion and Human Rights

Area 12: Environmental Management

AGRI 435	(3)	Soil and Water Quality Management
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 302	(3)	Environmental Management 1
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 404	(3)	Environmental Management 2
NRSC 333	(3)	Pollution and Bioremediation
WILD 401	(3)	Fisheries and Wildlife Management
WOOD 441	(3)	Integrated Forest Management

7.3.2 Bachelor of Arts and Science (B.A. & Sc.) – Interfaculty Program in Sustainability, Science and Society

The Interfaculty Program in Sustainability, Science and Society is open only to students in the B.A. & Sc. degree.

Adviser:

Michelle Maillet
Email: *advisor.geog@mcgill.ca*

For further information about this program, see *Bachelor of Arts and Science* > *Undergraduate* > *Browse Academic Units & Programs* > *Sustainability, Science and Society* > *: Bachelor of Arts and Science (B.A. & Sc.) - Interfaculty Program in Sustainability, Science and Society (54 credits)*.

7.4 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 comprises two course components: Core and Concentration.

1. **Core:** In the Core, the four introductory courses and an intermediate-level course expose students to different interdisciplinary perspectives, approaches, and world views to help them understand the complexity and conflicts that underlie most environmental problems. In the two senior-level courses of the Core, students will apply the general and specialized knowledge acquired through the rest of their program to the analysis of a selection of contemporary environmental problems. Students will be challenged by the Core program to look beyond the confines of their individual views of environment.

2. **Concentration:** In addition to the Core, students choose a Concentration, a transdisciplinary study of a particular theme or component of the environment. The requirements and complementary course sets vary between Concentrations. B.Sc.(Ag.Env.Sc.) and B.Sc. students can choose one of the following concentrations:

   - 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 may also choose one of the following concentrations:

   - 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 concentration online using Minerva;
- pass all courses counted toward the Major with a grade of **C** or higher;
- confirm that their course selection satisfies the required components of the Core and their chosen Concentration, and that the complementary courses are approved courses in their chosen Concentration; 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 & Environmental Sciences > Undergraduate > About the Faculty of Agricultural and Environmental Sciences, including School of Human Nutrition (Undergraduate) > : Faculty Information and Regulations*; for the B.Sc., see *Faculty of Science > Undergraduate > : Faculty Degree Requirements*. This includes meeting the minimum credit requirement as specified in their letter of admission.

7.4.1 Biodiversity and Conservation Concentration

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

7.4.1.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Major Environment - Biodiversity and Conservation (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.

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

Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), 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.

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 Macdonald campus in Sainte-Anne-de-Bellevue.

Required Courses (18 credits)

Location Note: ENVR courses are taught at both McGill's Downtown campus and Macdonald campus. You should register in Section 001 of an ENVR course on the Downtown campus, and in Section 051 of an ENVR course 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

Complementary Courses (45 credits)

Senior Research Project

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

3 credits from:

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project
GEOG 451	(3)	Research in Society and Development in Africa

Biological Principles of Diversity/ Systematics/ Conservation

3 credits from:

AEBI 212	(3)	Evolution and Phylogeny
BIOL 304	(3)	Evolution

3 credits from:

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

3 credits from:

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

Ecology:

3 credits from:

BIOL 308	(3)	Ecological Dynamics
ENVB 305	(3)	Population and Community Ecology

Statistics:

3 credits from the following Statistics courses or equivalent:

Note: Other appropriate statistics courses may be approved as substitutions by the Program Adviser. Credit given for Statistics courses is subject to certain restrictions. Students in the Faculty of Arts or the Faculty of Science should consult the “Course Overlap” information in the “Course Requirements” section of the e-Calendar 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

Science, Policy, and Management:

9 credits from the following:

*You may take AGEC 200 or ECON 208, but not both.

AEBI 423	(3)	Sustainable Land Use
AGEC 200*	(3)	Principles of Microeconomics
AGEC 430	(3)	Agriculture, Food and Resource Policy
BIOL 451	(3)	Research in Ecology and Development in Africa
ECON 208*	(3)	Microeconomic Analysis and Applications
ECON 225	(3)	Economics of the Environment
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 302	(3)	Environmental Management 1
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 360	(3)	Analyzing Sustainability
GEOG 408	(3)	Geography of Development
NRSC 451	(3)	Research in Ecology and Development in Africa
PLNT 312	(3)	Urban Horticulture
POLI 345	(3)	International Organizations
POLI 350	(3)	Global Environmental Politics
WCOM 314	(3)	Communicating Science

Field Courses

3 credits from the following:

BIOL 240	(3)	Monteregian Flora
BIOL 331	(3)	Ecology/Behaviour Field Course
BIOL 334D1	(1.5)	Applied Tropical Ecology
BIOL 334D2	(1.5)	Applied Tropical Ecology
BIOL 335	(3)	Marine Mammals
BIOL 553	(3)	Neotropical Environments
ENTO 340	(3)	Field Entomology
ENVB 410	(3)	Ecosystem Ecology
GEOG 495	(3)	Field Studies - Physical Geography
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology
WILD 401	(3)	Fisheries and Wildlife Management
WILD 475	(3)	Desert Ecology
WOOD 441	(3)	Integrated Forest Management

General Scientific Principles

6 credits from the following:

* Note: You may take one of BREE 529, ENVB 529 or GEOG 314; you may take one of GEOG 322 or BREE 217; you may take one of ANSC 326 or BIOL 324.

ANSC 326*	(3)	Fundamentals of Population Genetics
ATOC 341	(3)	Caribbean Climate and Weather
BIOL 202	(3)	Basic Genetics
BIOL 216	(3)	Biology of Behaviour
BIOL 324*	(3)	Ecological Genetics
BIOL 342	(3)	Global Change Biology of Aquatic Ecosystems
BIOL 432	(3)	Limnology
BIOL 441	(3)	Biological Oceanography
BIOL 515	(3)	Advances in Aquatic Ecology
BREE 217*	(3)	Hydrology and Water Resources
BREE 529*	(3)	GIS for Natural Resource Management
ENVB 313	(3)	Phylogeny and Biogeography
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVB 529*	(3)	GIS for Natural Resource Management
GEOG 272	(3)	Earth's Changing Surface
GEOG 314*	(3)	Geospatial Analysis
GEOG 321	(3)	Climatic Environments
GEOG 322*	(3)	Environmental Hydrology
LSCI 204	(3)	Genetics
MICR 331	(3)	Microbial Ecology
SOIL 315	(3)	Soil Nutrient Management

A second field course from the program curriculum may also be taken.

Social Science:

3 credits from the following:

AGEC 333	(3)	Resource Economics
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
ANSC 555	(3)	The Use and Welfare of Animals
ANTH 339	(3)	Ecological Anthropology
ANTH 416	(3)	Environment/Development: Africa
ANTH 451	(3)	Research in Society and Development in Africa
ECON 326	(3)	Ecological Economics
ENVR 421	(3)	Montreal: Environmental History and Sustainability
GEOG 404	(3)	Environmental Management 2
GEOG 498	(3)	Humans in Tropical Environments
GEOG 530	(3)	Global Land and Water Resources

Organisms and Diversity:

6 credits from the following:

* Note: You may take one of ENTO 330, BIOL 350 or ENTO 350.

AEBI 421	(3)	Tropical Horticultural Ecology
AGRI 340	(3)	Principles of Ecological Agriculture
BIOL 310	(3)	Biodiversity and Ecosystems

BIOL 343	(3)	Biodiversity in the Caribean
BIOL 350*	(3)	Insect Biology and Control
BIOL 352	(3)	Dinosaur Biology
BIOL 427	(3)	Herpetology
BIOL 510	(3)	Advances in Community Ecology
BIOL 540	(3)	Ecology of Species Invasions
ENTO 330*	(3)	Insect Biology
ENTO 350*	(3)	Insect Biology and Control
ENVR 540	(3)	Ecology of Species Invasions
PARA 424	(3)	Fundamental Parasitology
PLNT 304	(3)	Biology of Fungi
PLNT 434	(3)	Weed Biology and Control
REDM 400	(3)	Science and Museums
WILD 307	(3)	Natural History of Vertebrates
WILD 350	(3)	Mammalogy
WILD 420	(3)	Ornithology

7.4.2 Ecological Determinants of Health Concentration

This concentration is open only to students in the B.Sc.(Ag.Env.Sc.) Major Environment or B.Sc. Major Environment. Within this concentration, there are two program options: the Cellular stream, and the Population stream.

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

The Cellular 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 through the elements of food and infectious agents. Each of these elements is influenced by planned and unplanned environmental disturbances. For example, agricultural practices shift the balance between beneficial and harmful ingredients of food. Use of insecticides presents dilemmas with regard to the environment, economics, and human health. The distribution of infectious diseases is influenced by the climatic conditions that permit vectors to coexist with humans, by deforestation, by urbanization, and by human interventions ranging from the building of dams to provision of potable water.

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

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

Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), or contact Kathy Roulet, the Program Adviser (kathy.roulet@mcgill.ca).

Program Requirements

Note: You are required to take a maximum of 33 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)

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

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

Domain: Required Course (6 credits)

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

Domain: Complementary Courses (36 credits)

36 credits of the complementary courses are selected as follows:

18 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:

18 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
GEOG 503	(3)	Advanced Topics in Health Geography
NRSC 221*	(3)	Environment and Health
PPHS 529	(3)	Global Environmental Health and Burden of Disease
SOCI 234	(3)	Population and Society
SOCI 309	(3)	Health and Illness
SOCI 331	(3)	Population and Environment

Cellular Biology

* Note: You will not receive credit for either LSCI 211 or LSCI 202 if you have already received credit for both BIOL 200 and BIOL 201; you will not receive credit for either BIOL 200 or BIOL 201 if you have already received credit for both LSCI 202 and LSCI 211.

ANSC 234	(3)	Biochemistry 2
BIOL 201	(3)	Cell Biology and Metabolism
LSCI 202	(3)	Molecular Cell Biology

Genetics

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

Molecular Biology

* Note: You will not receive credit for either LSCI 211 or LSCI 202 if you have already received credit for both BIOL 200 and BIOL 201; you will not receive credit for either BIOL 200 or BIOL 201 if you have already received credit for both LSCI 202 and LSCI 211.

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

ANSC 433	(3)	Animal Nutrition and Metabolism
NUTR 207	(3)	Nutrition and Health
NUTR 307	(3)	Metabolism and Human Nutrition

Human Health:

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

Immunology and Pathogenicity

MICR 341	(3)	Mechanisms of Pathogenicity
MIMM 214	(3)	Introductory Immunology: Elements of Immunity
MIMM 314	(3)	Intermediate Immunology
PARA 438	(3)	Immunology
PATH 300	(3)	Human Disease

Infectious Disease

* Note: You can take MIMM 413 or PARA 424, but not both.

ANSC 400	(3)	Eukaryotic Cells and Viruses
MIMM 324	(3)	Fundamental Virology
MIMM 413*	(3)	Parasitology
PARA 424*	(3)	Fundamental Parasitology
PPHS 501	(3)	Population Health and Epidemiology

Toxicology

ANSC 312	(3)	Animal Health and Disease
ENVB 500	(3)	Advanced Topics in Ecotoxicology
NUTR 512	(3)	Herbs, Foods and Phytochemicals

PHAR 300	(3)	Drug Action
PHAR 303	(3)	Principles of Toxicology

Hormones

* Note: You will not receive credit for ANSC 424 if you have already received credit for both PHGY 209 and PHGY 210; you will not receive credit for PHGY 210 if you have already received credit for both ANSC 323 and ANSC 424.

ANSC 424*	(3)	Metabolic Endocrinology
PHGY 210*	(3)	Mammalian Physiology 2
PSYC 342	(3)	Hormones and Behaviour

Physiology

* Note: You will not receive credit ANSC 323 if you have already received credit for both PHGY 209 and PHGY 210; you will not receive credit for PHGY 209 if you have already received credit for both ANSC 323 and ANSC 424.

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.

ATOC 341	(3)	Caribbean Climate and Weather
BREE 217*	(3)	Hydrology and Water Resources
GEOG 321	(3)	Climatic Environments
GEOG 322*	(3)	Environmental Hydrology

Techniques and Management

AEBI 423	(3)	Sustainable Land Use
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 302	(3)	Environmental Management 1
GEOG 340	(3)	Sustainability in the Caribbean
NUTR 450	(3)	Research Methods: Human Nutrition

or, advanced quantitative methods course (with approval of Adviser).

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 Management

BREE 322	(3)	Organic Waste Management

BREE 518	(3)	Ecological Engineering
NRSC 333	(3)	Pollution and Bioremediation
PARA 515	(3)	Water, Health and Sanitation

Ecology

* Note: You may take ENVR 540 or BIOL 540, but not both; you many take BIOL 451 or NRSC 451, but not both.

AEBI 421	(3)	Tropical Horticultural Ecology
BIOL 343	(3)	Biodiversity in the Caribean
BIOL 432	(3)	Limnology
BIOL 451*	(3)	Research in Ecology and Development in Africa
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
NRSC 451*	(3)	Research in Ecology and Development in Africa
PLNT 304	(3)	Biology of Fungi
PLNT 460	(3)	Plant Ecology

7.4.2.2 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 through the elements of food and infectious agents. Each of these elements is influenced by planned and unplanned environmental disturbances. For example, agricultural practices shift the balance between beneficial and harmful ingredients of food. Use of insecticides presents dilemmas with regard to the environment, economics, and human health. The distribution of infectious diseases is influenced by the climatic conditions that permit vectors to coexist with humans, by deforestation, by urbanization, and by human interventions ranging from the building of dams to provision of potable water.

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

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

Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), or contact Kathy Roulet, the Program Adviser (kathy.roulet@mcgill.ca).

Program Requirements

Note: You 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)

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

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

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:

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

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

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

Fundamentals:

24 credits of fundamentals, 3 credits from each category:

Health and Environment

GEOG 221	(3)	Environment and Health
GEOG 303	(3)	Health Geography
NRSC 221	(3)	Environment and Health

Health and Society

GEOG 403	(3)	Global Health and Environmental Change
GEOG 503	(3)	Advanced Topics in Health Geography
PPHS 529	(3)	Global Environmental Health and Burden of Disease
SOCI 234	(3)	Population and Society
SOCI 309	(3)	Health and Illness
SOCI 331	(3)	Population and Environment

Toxicology

ANSC 312	(3)	Animal Health and Disease
ENVB 500	(3)	Advanced Topics in Ecotoxicology
NUTR 512	(3)	Herbs, Foods and Phytochemicals
PHAR 303	(3)	Principles of Toxicology

Cellular Biology

Note: You will not receive credit for either LSCI 211 or LSCI 202, if you have already received credit for both BIOL 200 and BIOL 201; you will not receive credit for either BIOL 200 or BIOL 201 if you have already received credit for LSCI 202 and LSCI 211.

ANSC 234	(3)	Biochemistry 2
BIOL 201	(3)	Cell Biology and Metabolism
LSCI 202	(3)	Molecular Cell Biology

Molecular Biology

Note: You will not receive credit for either LSCI 211 or LSCI 202 if you have already received credit for both BIOL 200 and BIOL 201; you will not receive credit for either BIOL 200 or BIOL 201 if you have already received credit for both LSCI 202 and LSCI 211.

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

ANSC 433	(3)	Animal Nutrition and Metabolism
NUTR 207	(3)	Nutrition and Health
NUTR 307	(3)	Metabolism and Human Nutrition

Advanced Ecology

* Note: You may take ENVR 540 or BIOL 540, but not both; you make take BIOL 451 or NRSC 451, but not both.

AEBI 421	(3)	Tropical Horticultural Ecology
BIOL 451*	(3)	Research in Ecology and Development in Africa
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
NRSC 451*	(3)	Research in Ecology and Development in Africa
PLNT 460	(3)	Plant Ecology

List A:

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

Hydrology, Climate, and Agriculture

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

AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 550	(3)	Sustained Tropical Agriculture
ATOC 341	(3)	Caribbean Climate and Weather
BREE 217*	(3)	Hydrology and Water Resources
GEOG 321	(3)	Climatic Environments
GEOG 322*	(3)	Environmental Hydrology

Decision Making, Techniques and Management

* Note: You may take AGEC 200 or ECON 208, but not both; you may take ENVB 529 or GEOG 201, but not both.

AEBI 423	(3)	Sustainable Land Use
AGEC 200*	(3)	Principles of Microeconomics
AGEC 333	(3)	Resource Economics
ECON 208*	(3)	Microeconomic Analysis and Applications
ENVB 437	(3)	Assessing Environmental Impact
ENVB 529*	(3)	GIS for Natural Resource Management
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 302	(3)	Environmental Management 1
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 404	(3)	Environmental Management 2
PHIL 343	(3)	Biomedical Ethics

or, advanced quantitative methods course (with approval of Adviser).

Development and History

ANTH 212	(3)	Anthropology of Development
EDER 461	(3)	Society and Change
HIST 292	(3)	History and the Environment
NUTR 501	(3)	Nutrition in Developing Countries
SOCI 254	(3)	Development and Underdevelopment
URBP 520	(3)	Globalization: Planning and Change

List B:

9 credits from the following List B categories, maximum of 3 credits from any one category:

Immunology and Infectious Disease

ANSC 400	(3)	Eukaryotic Cells and Viruses
MIMM 214	(3)	Introductory Immunology: Elements of Immunity
MIMM 314	(3)	Intermediate Immunology
MIMM 324	(3)	Fundamental Virology
MIMM 413	(3)	Parasitology
PARA 424	(3)	Fundamental Parasitology
PARA 438	(3)	Immunology
PPHS 501	(3)	Population Health and Epidemiology

Populations and Place

* Note: You may take ANTH 451 or GEOG 451, but not both.

AGRI 411	(3)	Global Issues on Development, Food and Agriculture
ANTH 451*	(3)	Research in Society and Development in Africa
ENVR 421	(3)	Montreal: Environmental History and Sustainability
GEOG 300	(3)	Human Ecology in Geography
GEOG 451*	(3)	Research in Society and Development in Africa
GEOG 498	(3)	Humans in Tropical Environments
NUTR 341	(3)	Global Food Security

Pollution Control and Pest Management

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

BIOL 350*	(3)	Insect Biology and Control
BREE 322	(3)	Organic Waste Management
ENTO 350*	(3)	Insect Biology and Control
ENTO 352	(3)	Biocontrol of Pest Insects
NRSC 333	(3)	Pollution and Bioremediation
PARA 515	(3)	Water, Health and Sanitation

Genetics

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

7.4.3 Environmetrics Concentration

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

7.4.3.1 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 Bieler School of Environment 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 "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), or contact Kathy Roulet, the Program Adviser (kathy.roulet@mcgill.ca).

Prerequisites and equivalent courses are common with Math courses, so check with your adviser 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 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 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, 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.

ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

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, 3 credits from each category.

Ecology

BIOL 308	(3)	Ecological Dynamics
ENVB 305	(3)	Population and Community Ecology

Impact

ENVB 437	(3)	Assessing Environmental Impact
GEOG 340	(3)	Sustainability in the Caribbean

MIME 308	(3)	Social Impact of Technology

Modelling

BIOL 309	(3)	Mathematical Models in Biology
ENVB 506	(3)	Quantitative Methods: Ecology

GIS Techniques

ENVB 529	(3)	GIS for Natural Resource Management
GEOG 201	(3)	Introductory Geo-Information Science

Basic Environmental Science:

One of:

BREE 217	(3)	Hydrology and Water Resources
CIVE 323	(3)	Hydrology and Water Resources
ENVB 210	(3)	The Biophysical Environment
GEOG 305	(3)	Soils and Environment
GEOG 322	(3)	Environmental Hydrology
GEOG 350	(3)	Ecological Biogeography

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 401	(3)	Socio-Environmental Systems: Theory and Simulation
MATH 223	(3)	Linear Algebra
MATH 326	(3)	Nonlinear Dynamics and Chaos
MATH 423	(3)	Applied Regression
MATH 447	(3)	Introduction to Stochastic Processes
MATH 525	(4)	Sampling Theory and Applications
SOCI 504	(3)	Quantitative Methods 1
SOCI 580	(3)	Social Research Design and Practice

List 2

3 credits minimum of environmental sciences chosen from:

AGRI 550	(3)	Sustained Tropical Agriculture
ATOC 341	(3)	Caribbean Climate and Weather
BIOL 331	(3)	Ecology/Behaviour Field Course
BIOL 343	(3)	Biodiversity in the Caribean
BIOL 553	(3)	Neotropical Environments
ENVB 313	(3)	Phylogeny and Biogeography
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVR 421	(3)	Montreal: Environmental History and Sustainability
ENVR 422	(3)	Montreal Urban Sustainability Analysis
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 499	(3)	Subarctic Field Studies
NRSC 333	(3)	Pollution and Bioremediation
PLNT 460	(3)	Plant Ecology
WILD 401	(3)	Fisheries and Wildlife Management

7.4.4 Food Production and Environment Concentration

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

7.4.4.1 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. Major in Environment programs.

The business of food production is an area of human activity with a large and intimate interaction with the environment. As the global population rises, demand for food and food production increases. This demand must be met through a combination of increased productivity of existing agricultural land and by bringing new arable land into production. This is a serious challenge for two main reasons. Firstly, there are environmental impacts of agricultural activities

which can be significant and which can be difficult to assess and contain, as the effects range from loss of biodiversity due to increasing farm size, production of biofuels versus food, non-point source pollution of rivers and lakes, and a loss of arable land to urbanization. Secondly, a growing population needs support from a number of different land uses (e.g., urban growth, transportation, water resource use, timber resources, etc.), many of which conflict, and all of which compete with food production land requirements. As the available land resource decreases, land-use competition for what remains will grow more fierce, making the need for smart and informed decision-making related to food production increasingly critical.

Program Prerequisites or Corequisites

All students in this program MUST take these pre- or corequisite courses, or their equivalents. These courses are taken as follows:

One of the following 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 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 "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), or contact 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)

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.

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

Domain: Required Courses (6 credits)

AEBI 210	(3)	Organisms 1
AGRI 340	(3)	Principles of Ecological Agriculture

Domain: Complementary Courses (36 credits)

36 credits of complementary courses selected as follows:

18 credits - Fundamentals

12 credits - Applied Sciences

6 credits - Social Sciences/Humanities

The Applied and Social Sciences courses are grouped according to subtopics. Students can choose their courses from one subtopic, or a combination of subtopics.

Fundamentals (18 credits)

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:

ANSC 250	(3)	Principles of Animal Science
PLNT 300	(3)	Cropping Systems

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 and Community Ecology

One of:

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

Applied Sciences (12 credits)

Food and Human Health

* Note: Students take FDSC 200 or NUTR 207, but not both.

AGRI 411	(3)	Global Issues on Development, Food and Agriculture
FDSC 200*	(3)	Introduction to Food Science
MICR 331	(3)	Microbial Ecology
NUTR 207*	(3)	Nutrition and Health

NUTR 501	(3)	Nutrition in Developing Countries
NUTR 505	(3)	Public Health Nutrition
PARA 410	(3)	Environment and Infection
PHAR 303	(3)	Principles of Toxicology

Food Production

AEBI 421	(3)	Tropical Horticultural Ecology
AEBI 425	(3)	Tropical Energy and Food
AGRI 215	(3)	Agro-Ecosystems Field Course
AGRI 325	(3)	Sustainable Agriculture and Food Security
AGRI 550	(3)	Sustained Tropical Agriculture
BIOL 385	(3)	Plant Growth and Development
ENTO 352	(3)	Biocontrol of Pest Insects
PLNT 302	(3)	Forage Crops and Pastures
PLNT 307	(3)	Agroecology of Vegetables and Fruits
PLNT 353	(3)	Plant Structure and Function
PLNT 430	(3)	Pesticides in Agriculture
PLNT 434	(3)	Weed Biology and Control
SOIL 315	(3)	Soil Nutrient Management

Natural Resources and Natural Resource Impacts

* Note: Students take BIOL 465 or WILD 421, but not both.

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

AGRI 435	(3)	Soil and Water Quality Management
BIOL 343	(3)	Biodiversity in the Caribean
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)	Ecological Engineering
ENVB 500	(3)	Advanced Topics in Ecotoxicology
GEOG 322**	(3)	Environmental Hydrology
NRSC 333	(3)	Pollution and Bioremediation
SOIL 510	(3)	Environmental Soil Chemistry
WILD 401	(3)	Fisheries and Wildlife Management
WILD 421*	(3)	Wildlife Conservation

Social Science (6 credits)

Economic and Resource Policy

* Note: Students take AGEC 333 or ECON 405, but not both.

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
ECON 225	(3)	Economics of the Environment
ECON 405*	(3)	Natural Resource Economics

Social Change and Human Impacts

ENVR 421	(3)	Montreal: Environmental History and Sustainability
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 406	(3)	Human Dimensions of Climate Change
GEOG 410	(3)	Geography of Underdevelopment: Current Problems
GEOG 498	(3)	Humans in Tropical Environments
GEOG 510	(3)	Humid Tropical Environments
HIST 510	(3)	Environmental History of Latin America (Field)
SOCI 254	(3)	Development and Underdevelopment

Environment Management

* Note: Students may take only one of BREE 529, ENVB 529, or GEOG 201.

AEBI 423	(3)	Sustainable Land Use
ANTH 418	(3)	Environment and Development
BREE 529*	(3)	GIS for Natural Resource Management
ENVB 437	(3)	Assessing Environmental Impact
ENVB 529*	(3)	GIS for Natural Resource Management
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 302	(3)	Environmental Management 1
GEOG 404	(3)	Environmental Management 2
GEOG 530	(3)	Global Land and Water Resources
MGPO 440	(3)	Strategies for Sustainability

7.4.5 Land Surface Processes and Environmental Change Concentration

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

7.4.5.1 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 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 "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), 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.

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)

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.

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project
GEOG 451	(3)	Research in Society and Development in Africa

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, Geographic Information Systems, 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 List A: Particular Environments and List B: Surface Processes

Statistics

3 credits from one of the following Statistics courses or equivalent:

* Note: Other appropriate statistics courses may be approved as substitutions by the Program Adviser. Credit given for Statistics courses is subject to certain restrictions. Students in the Faculty of Arts or the Faculty of Science should consult the "Course Overlap" information in the "Course Requirements" section of the eCalendar 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

Geographic Information Systems

3 credits from:

ENVB 529	(3)	GIS for Natural Resource Management
GEOG 201	(3)	Introductory Geo-Information Science

Weather and Climate

3 credits from:

ATOC 215	(3)	Oceans, Weather and Climate
ATOC 341	(3)	Caribbean Climate and Weather
ENVB 301	(3)	Meteorology

Fundamental Land Surface Processes

9 credits total of fundamental land surface processes chosen as follows:

0-3 credits chosen from:

GEOG 321	(3)	Climatic Environments

0-3 credits from:

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

0-3 credits from:

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

0-3 credits from:

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

Environment and Resource Management:

3 credits from:

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

AGRI 550	(3)	Sustained Tropical Agriculture
BIOL 308*	(3)	Ecological Dynamics
BIOL 465	(3)	Conservation Biology
CIVE 225	(4)	Environmental Engineering
ENVB 305*	(3)	Population and Community Ecology
ENVB 437	(3)	Assessing Environmental Impact
ENVB 530	(3)	Advanced GIS for Natural Resource Management
ENVR 422	(3)	Montreal Urban Sustainability Analysis
ESYS 301	(3)	Earth System Modelling
GEOG 302	(3)	Environmental Management 1
GEOG 308	(3)	Remote Sensing for Earth Observation

GEOG 340	(3)	Sustainability in the Caribbean
GEOG 404	(3)	Environmental Management 2
GEOG 506	(3)	Advanced Geographic Information Science
GEOG 530	(3)	Global Land and Water Resources
SOIL 315	(3)	Soil Nutrient Management
WILD 421	(3)	Wildlife Conservation
WOOD 441	(3)	Integrated Forest Management

Field Course

3 credits from:

ATOC 555	(3)	Field Course 1
BIOL 343	(3)	Biodiversity in the Caribean
BIOL 553	(3)	Neotropical Environments
GEOG 495	(3)	Field Studies - Physical Geography
GEOG 496	(3)	Geographical Excursion
GEOG 499	(3)	Subarctic Field Studies
WILD 475	(3)	Desert Ecology

Social Science:

3 credits from:

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
ENVR 421	(3)	Montreal: Environmental History and Sustainability
GEOG 221	(3)	Environment and Health
GEOG 408	(3)	Geography of Development
GEOG 498	(3)	Humans in Tropical Environments
HIST 510	(3)	Environmental History of Latin America (Field)
NRSC 221	(3)	Environment and Health
POLI 350	(3)	Global Environmental Politics
URBP 520	(3)	Globalization: Planning and Change
WCOM 314	(3)	Communicating Science

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:

BIOL 432	(3)	Limnology
ENVB 410	(3)	Ecosystem Ecology
GEOG 372	(3)	Running Water Environments

GEOG 470	(3)	Wetlands
GEOG 550	(3)	Historical Ecology Techniques
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology

List B - Surface Processes:

3-9 credits advanced study of Surface Processes:

ATOC 315	(3)	Thermodynamics and Convection
BREE 509	(3)	Hydrologic Systems and Modelling.
EPSC 549	(3)	Hydrogeology
GEOG 401	(3)	Socio-Environmental Systems: Theory and Simulation
GEOG 505	(3)	Global Biogeochemistry
GEOG 537	(3)	Advanced Fluvial Geomorphology
MICR 331	(3)	Microbial Ecology
NRSC 333	(3)	Pollution and Bioremediation
SOIL 510	(3)	Environmental Soil Chemistry
SOIL 535	(3)	Soil Ecology

7.4.6 Renewable Resource Management Concentration

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

7.4.6.1 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of Science (B.Sc.) - Major Environment - Renewable Resource Management (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.

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

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

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 "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), 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.

ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

Domain: Complementary Courses (42 credits)

42 credits of complementary courses are selected as follows:

9 credits - Basic Principles of Ecosystem Processes and Diversity

6 credits - 3 credits from each category of Statistics and GIS

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 and 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 529	(3)	GIS for Natural Resource Management
GEOG 201	(3)	Introductory Geo-Information Science

Advanced Ecosystem Components:

6 credits of advanced ecosystem components selected from:

BIOL 553	(3)	Neotropical Environments
GEOG 372	(3)	Running Water Environments
PLNT 358	(3)	Flowering Plant Diversity
SOIL 326	(3)	Soils in a Changing Environment
WILD 307	(3)	Natural History of Vertebrates

Advanced Ecological Processes:

6 credits of advanced ecological processes selected from:

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

BIOL 343	(3)	Biodiversity in the Caribean
BIOL 432	(3)	Limnology
BIOL 465	(3)	Conservation Biology
BREE 217*	(3)	Hydrology and Water Resources
ENVB 410	(3)	Ecosystem Ecology
ENVB 500	(3)	Advanced Topics in Ecotoxicology
GEOG 322*	(3)	Environmental Hydrology
MICR 331	(3)	Microbial Ecology
NRSC 333	(3)	Pollution and Bioremediation
PLNT 460	(3)	Plant Ecology

Social Processes:

6 credits of social processes selected as follows:

* Note: You may take AGEC 333 and ECON 405, but not both.

AGEC 242	(3)	Management Theories and Practices
AGEC 333*	(3)	Resource Economics

ANTH 339	(3)	Ecological Anthropology
ECON 405*	(3)	Natural Resource Economics
ENVR 421	(3)	Montreal: Environmental History and Sustainability
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 382	(3)	Principles Earth Citizenship
GEOG 498	(3)	Humans in Tropical Environments
RELG 270	(3)	Religious Ethics and the Environment

Ecosystem Components or Management of Ecosystems:

9 credits of ecosystem components or management of ecosystems selected from:

AGRI 435	(3)	Soil and Water Quality Management
AGRI 452	(3)	Water Resources in Barbados
AGRI 550	(3)	Sustained Tropical Agriculture
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 302	(3)	Environmental Management 1
GEOG 404	(3)	Environmental Management 2
PLNT 300	(3)	Cropping Systems
WILD 401	(3)	Fisheries and Wildlife Management
WOOD 441	(3)	Integrated Forest Management

7.4.7 Water Environments and Ecosystems Concentration

This concentration is open only to students in the B.Sc.(Ag.Env.Sc.) Major Environment or B.Sc. Major Environment. Within this concentration, there are two program options: the Biological stream, and the Physical stream.

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

The Water Environments and Ecosystems - Biological (60 credits including core) is a concentration open only to students in the B.Sc.(Ag.Env.Sc.); Major in Environment or B.Sc.; Major in Environment program.

The program focuses on the ecological facet of the water environment and the mechanisms regulating the different forms of life in water bodies; and to a lesser extent on 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 "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), 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.

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.

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project
GEOG 451	(3)	Research in Society and Development in Africa

Domain: Required Courses (3 credits)

ATOC 214	(3)	Introduction: Physics of the Atmosphere

Domain: Complementary Courses (36 credits)

36 credits of complementary courses are selected as follows:

3 credits - Meteorology

6 credits - Hydrology and Ecology

3 credits - Statistics

3 credits - Field Course

3 credits - Social Sciences and Policy

18 credits chosen in total from List A: Water Environments and Habitats, and List B: Surface and Atmospheric Processes

Meteorology:

3 credits from:

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

Hydrology and Ecology:

6 credits selected as follows:

3 credits from:

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

3 credits from:

BIOL 308	(3)	Ecological Dynamics
ENVB 305	(3)	Population and Community Ecology

Statistics:

3 credits from:

* Note: Other appropriate statistics courses may be approved as substitutes by the Program Adviser. Credit for Statistics courses is subject to certain restrictions. Students in the Faculty of Arts or the Faculty of Science should consult "Course Overlap" information in the "Course Requirements" section of the eCalendar for the Faculty of Science.

AEMA 310*	(3)	Statistical Methods 1
BIOL 373	(3)	Biometry
GEOG 202	(3)	Statistics and Spatial Analysis
MATH 203	(3)	Principles of Statistics 1

Field Course:

3 credits selected from the following courses or an equivalent Aquatic Field course:

BIOL 331	(3)	Ecology/Behaviour Field Course
BIOL 334D1	(1.5)	Applied Tropical Ecology
BIOL 334D2	(1.5)	Applied Tropical Ecology
BIOL 335	(3)	Marine Mammals
BIOL 343	(3)	Biodiversity in the Caribean
GEOG 495	(3)	Field Studies - Physical Geography
WILD 401	(3)	Fisheries and Wildlife Management

Social Sciences and Policy:

3 credits from:

AGEC 333	(3)	Resource Economics
ANSC 555	(3)	The Use and Welfare of Animals
ANTH 339	(3)	Ecological Anthropology
ANTH 418	(3)	Environment and Development
ECON 225	(3)	Economics of the Environment
ECON 326	(3)	Ecological Economics
ENVB 437	(3)	Assessing Environmental Impact
ENVR 421	(3)	Montreal: Environmental History and Sustainability
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 302	(3)	Environmental Management 1
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 404	(3)	Environmental Management 2
GEOG 498	(3)	Humans in Tropical Environments
GEOG 530	(3)	Global Land and Water Resources
HIST 510	(3)	Environmental History of Latin America (Field)
POLI 345	(3)	International Organizations
POLI 350	(3)	Global Environmental Politics
WCOM 314	(3)	Communicating Science
WILD 421	(3)	Wildlife Conservation

18 credits chosen in total from List A and List B as follows:

List A (Water Environments and Habitats)

9-12 credits chosen from:

* Note: you may take BIOL 540 or ENVR 540, but not both; you may take ENVB 210 or GEOG 305, but not both,

BIOL 310	(3)	Biodiversity and Ecosystems
BIOL 342	(3)	Global Change Biology of Aquatic Ecosystems
BIOL 432	(3)	Limnology
BIOL 441	(3)	Biological Oceanography
BIOL 465	(3)	Conservation Biology
BIOL 540*	(3)	Ecology of Species Invasions
BIOL 553	(3)	Neotropical Environments
BREE 533	(3)	Water Quality Management
ENVB 210*	(3)	The Biophysical Environment
ENVB 410	(3)	Ecosystem Ecology
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVR 540*	(3)	Ecology of Species Invasions
GEOG 305*	(3)	Soils and Environment
GEOG 470	(3)	Wetlands
MICR 331	(3)	Microbial Ecology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
SOIL 535	(3)	Soil Ecology
WILD 302	(3)	Fish Ecology
WILD 401	(3)	Fisheries and Wildlife Management

List B (Surface and Atmospheric Processes)

6-9 credits chosen from:

* Note: you may take ATOC 219 or CHEM 219, but not both; you may take ENVB 529 or GEOG 201, but not both.

ATOC 219*	(3)	Introduction to Atmospheric Chemistry
ATOC 341	(3)	Caribbean Climate and Weather
BIOL 515	(3)	Advances in Aquatic Ecology
CHEM 219*	(3)	Introduction to Atmospheric Chemistry
CHEM 267	(3)	Introductory Chemical Analysis
ENVB 529*	(3)	GIS for Natural Resource Management
ENVB 530	(3)	Advanced GIS for Natural Resource Management
EPSC 220	(3)	Principles of Geochemistry
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 308	(3)	Remote Sensing for Earth Observation
GEOG 372	(3)	Running Water Environments
GEOG 505	(3)	Global Biogeochemistry
GEOG 506	(3)	Advanced Geographic Information Science

GEOG 537	(3)	Advanced Fluvial Geomorphology
GEOG 550	(3)	Historical Ecology Techniques

7.4.7.2 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)

The Water Environments and Ecosystems - Physical (63 credits, including the core) is a a concentration open only to students in the B.Sc.(Ag.Env.Sc.); Major in Environment or B.Sc.; Major in Environment program.

The program focuses on the physical facet of the water environment, and the transport and transformation mechanisms of water on the planet, from rivers to the oceans and atmosphere; and to a lesser extent on 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 on courses to take in your first year (U1), you can consult the "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), 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.

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.

AEBI 427	(6)	Barbados Interdisciplinary Project
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project
GEOG 451	(3)	Research in Society and Development in Africa

Domain: Required Courses (9 credits)

ATOC 214	(3)	Introduction: Physics of the Atmosphere
ATOC 315	(3)	Thermodynamics and Convection
GEOG 372	(3)	Running Water Environments

Domain: Complementary Courses (33 credits)

33 credits of complementary courses are selected as follows:

3 credits - Meteorology

6 credits - Hydrology and Ecology

3 credits - Statistics

3 credits - Intermediate Calculus

3 credits - Field course

9 credits chosen from List A: Engineering/Math/Hydrology

6 credits chosen from List B: Marine and Freshwater Biology

Meteorology

3 credits from:

ATOC 215	(3)	Oceans, Weather and Climate
ATOC 341	(3)	Caribbean Climate and Weather
ENVB 301	(3)	Meteorology

Hydrology and Ecology

6 credits selected as follows:

3 credits from:

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

3 credits from:

BIOL 308	(3)	Ecological Dynamics
ENVB 305	(3)	Population and Community Ecology

Statistics

3 credits from:

* Note: Other appropriate statistics courses may be approved as substitutes by the Program Adviser.

Credit given for Statistics courses is subject to certain restrictions. Students in the Faculty of Arts or the Faculty of Science should consult the "Course Overlap" information in the "Course Requirements" section of the eCalendar for the Faculty of Science.

AEMA 310*	(3)	Statistical Methods 1
BIOL 373	(3)	Biometry
GEOG 202	(3)	Statistics and Spatial Analysis
MATH 203	(3)	Principles of Statistics 1

Intermediate Calculus

3 credits from:

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

Field Course:

3 credits selected from the following courses or an equivalent Aquatic Field course:

BIOL 331	(3)	Ecology/Behaviour Field Course

BIOL 334D1	(1.5)	Applied Tropical Ecology
BIOL 334D2	(1.5)	Applied Tropical Ecology
BIOL 335	(3)	Marine Mammals
BIOL 343	(3)	Biodiversity in the Caribean
GEOG 495	(3)	Field Studies - Physical Geography
WILD 401	(3)	Fisheries and Wildlife Management

List A: (Engineering/Math/Hydrology)

6-9 credits chosen from:

* Note: You can taken ENVB 529 or GEOG 201, but not both; you can take ENVB 530 or GEOG 506, but not both; you can take ENVB 210 or GEOG 305, but not both.

ATOC 309	(3)	Weather Radars and Satellites
BREE 416	(3)	Engineering for Land Development
BREE 420	(3)	Engineering for Sustainability
BREE 506	(3)	Advances in Drainage Management
BREE 509	(3)	Hydrologic Systems and Modelling.
BREE 533	(3)	Water Quality Management
CIVE 323	(3)	Hydrology and Water Resources
ENVB 210*	(3)	The Biophysical Environment
ENVB 529*	(3)	GIS for Natural Resource Management
ENVB 530	(3)	Advanced GIS for Natural Resource Management
EPSC 549	(3)	Hydrogeology
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 305*	(3)	Soils and Environment
GEOG 308	(3)	Remote Sensing for Earth Observation
GEOG 314	(3)	Geospatial Analysis
GEOG 506	(3)	Advanced Geographic Information Science
GEOG 537	(3)	Advanced Fluvial Geomorphology
SOIL 315	(3)	Soil Nutrient Management
URBP 520	(3)	Globalization: Planning and Change

0-3 credits from:

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

List B: (Marine and Freshwater Biology)

6 credits chosen from:

BIOL 310	(3)	Biodiversity and Ecosystems
BIOL 342	(3)	Global Change Biology of Aquatic Ecosystems
BIOL 432	(3)	Limnology
BIOL 441	(3)	Biological Oceanography
BIOL 465	(3)	Conservation Biology

BIOL 553	(3)	Neotropical Environments
ENVB 410	(3)	Ecosystem Ecology
GEOG 470	(3)	Wetlands
GEOG 505	(3)	Global Biogeochemistry
GEOG 530	(3)	Global Land and Water Resources
WILD 302	(3)	Fish Ecology
WILD 421	(3)	Wildlife Conservation

7.5 Major in Environment – B.Sc.

In addition to the concentrations 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 concentrations:

- Atmospheric Environment and Air Quality
- Earth Sciences and Economics

Refer to *section 7.4: Major in Environment - B.Sc.(Ag.Env.Sc.) and B.Sc.* for the general guidelines and regulations, which apply to all concentrations in the Major in Environment program.

7.5.1 Atmospheric Environment and Air Quality Concentration

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

7.5.1.1 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 pollution through rainfall. The domain also gives students the training required to understand the important chemical reactions taking place within the atmosphere, as well as the know-how necessary to measure and analyze atmospheric constituents.

Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment).

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 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

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.

ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

Domain: Required Courses (15 credits)

15 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
GEOG 308	(3)	Remote Sensing for Earth Observation

Domain: Complementary Courses (24 credits)

24 credits of complementary courses are selected as follows:

6 credits - Analytical Chemistry/Calculus courses

3 credits - Statistics

9 credits - Math or Physical Science

6 credits - Social Science

Analytical Chemistry/Calculus:

One of (students will not receive credit for both):

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

Note: Students take either CHEM 267 or FDSC 213.

CHEM 267	(3)	Introductory Chemical Analysis
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 519 or CHEM 519, 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

ATOC 519*	(3)	Advances in Chemistry of Atmosphere
ATOC 540	(3)	Synoptic Meteorology 1
CHEM 273	(3)	Introductory Physical Chemistry 2: Kinetics and Methods
CHEM 377	(3)	Instrumental Analysis 2
CHEM 519*	(3)	Advances in Chemistry of Atmosphere
CIVE 225	(4)	Environmental Engineering
CIVE 561	(3)	Greenhouse Gas Emissions
COMP 208	(3)	Computer Programming for Physical Sciences and Engineering
GEOG 505	(3)	Global Biogeochemistry
MATH 223	(3)	Linear Algebra
MATH 315*	(3)	Ordinary Differential Equations
NRSC 333	(3)	Pollution and Bioremediation
NRSC 510	(3)	Agricultural Micrometeorology

Social Science:

6 credits from:

ANTH 206	(3)	Environment and Culture
ANTH 418	(3)	Environment and Development
ECON 225	(3)	Economics of the Environment
ECON 347	(3)	Economics of Climate Change
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 221	(3)	Environment and Health
GEOG 302	(3)	Environmental Management 1
GEOG 303	(3)	Health Geography
GEOG 340	(3)	Sustainability in the Caribbean
GEOG 403	(3)	Global Health and Environmental Change
GEOG 404	(3)	Environmental Management 2
GEOG 498	(3)	Humans in Tropical Environments
RELG 270	(3)	Religious Ethics and the Environment

7.5.2 Earth Sciences and Economics Concentration

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

7.5.2.1 Bachelor of Science (B.Sc.) - Major Environment - Earth Sciences and Economics (66 credits)

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

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

Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "Bieler School of Environment Student Handbook" available on the website (http://www.mcgill.ca/environment), or contact 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.

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 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.

ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
FSCI 444	(6)	Barbados Research Project

Domain: Required Courses (21 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
EPSC 220	(3)	Principles of Geochemistry
EPSC 240	(3)	Geology in the Field

Domain: Complementary Courses (24 credits)

24 credits of complementary courses are selected as follows:

3 credits - Statistics courses

12 credits - Economic Resources

9 credits - Natural Resources

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

Economic Resources

12 credits from:

AGEC 333	(3)	Resource Economics
ECON 209	(3)	Macroeconomic Analysis and Applications
ECON 305	(3)	Industrial Organization
ECON 313	(3)	Economic Development 1
ECON 314	(3)	Economic Development 2
ECON 326	(3)	Ecological Economics
ECON 347	(3)	Economics of Climate Change
ECON 408	(3)	Public Sector Economics 1
ECON 409	(3)	Public Sector Economics 2
ECON 416	(3)	Topics in Economic Development 2
ECON 511	(3)	Energy, Economy and Environment
ECON 525	(3)	Project Analysis
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis

Natural Resources

9 credits from:

* ANTH 451 or GEOG 451 can be taken, but not both; BIOL 451 or NRSC 451 can be taken, but not both; ENVB 529 or GEOG 201 can be taken, but not both.

AGRI 550	(3)	Sustained Tropical Agriculture
ANTH 451*	(3)	Research in Society and Development in Africa
BIOL 343	(3)	Biodiversity in the Caribean
BIOL 451*	(3)	Research in Ecology and Development in Africa
BIOL 553	(3)	Neotropical Environments
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVB 529*	(3)	GIS for Natural Resource Management
ENVR 421	(3)	Montreal: Environmental History and Sustainability
EPSC 331	(3)	Field School 2
EPSC 341	(3)	Field School 3
EPSC 355	(3)	Sedimentary Geology
EPSC 425	(3)	Sediments to Sequences
EPSC 435	(3)	Applied Geophysics
EPSC 452	(3)	Mineral Deposits
EPSC 519	(3)	Isotopes in Earth and Environmental Science
EPSC 549	(3)	Hydrogeology
EPSC 590	(3)	Applied Geochemistry Seminar
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 302	(3)	Environmental Management 1
GEOG 305	(3)	Soils and Environment
GEOG 322	(3)	Environmental Hydrology

GEOG 451*	(3)	Research in Society and Development in Africa
MIME 320	(3)	Extraction of Energy Resources
NRSC 451*	(3)	Research in Ecology and Development in Africa
SOIL 300	(3)	Geosystems
SOIL 315	(3)	Soil Nutrient Management
SOIL 326	(3)	Soils in a Changing Environment
SOIL 535	(3)	Soil Ecology

7.6 Honours Program in Environment

Adviser

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

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.

7.6.1 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 Bieler 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 Bieler School of Environment 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).

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

7.6.2 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 CGPA of 3.0 at graduation, and a minimum Program GPA of 3.3 to obtain Honours.

Students in the B.Sc. Honours programs complete the core and domain courses (60 to 66 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 Bieler School of Environment 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).

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

7.6.3 Bachelor of Arts and Science (B.A. & Sc.) - Honours Environment (60 credits)

This program is open only to students in the B.A. & Sc. Interfaculty Program Environment.

To be eligible for Honours, students must satisfy the requirements set by their B.A. & 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 CGPA of 3.0 at graduation, and a minimum Program GPA of 3.3 to obtain Honours.

5. B.A. & Sc. students must complete at least 21 credits in the Faculty of Arts and at least 21 in the Faculty of Science as part of their Honours program and their Minor concentration or Minor program. For a list of available Minor concentrations or Minor programs, see "Overview of Programs Offered" and "Minor Concentrations or Minors."

Students in the B.A. & Sc. Honours programs complete the coursework (54 credits) for the Interfaculty Program in Environment as well as the Honours required courses (6 credits).

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 Bieler School of Environment 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).

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

7.6.4 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.

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.

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 Bieler School Program Adviser.

Honours - Required Courses (6 credits)

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

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

7.7 Joint Honours Component Environment

Adviser

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This program is open only to students in the Faculty of Arts.

The Joint Honours Component Environment offers students the opportunity to undertake a year-long, interdisciplinary research project in their final year in close association with a professor. Honours research provides excellent preparation for graduate studies, but is not required for such studies. If, for some reason, students cannot complete the Joint Honours requirements, they may still graduate with a Minor Concentration Environment.

7.7.1 Bachelor of Arts (B.A.) - Joint Honours Component Environment (36 credits)

Students wishing to study at the honours level in two disciplines can combine joint honours program components in any two Arts disciplines. For a list of available joint honours programs, see "Overview of Programs Offered" and "Joint Honours Programs".

Joint Honours students should consult an adviser in each department for approval of their course selection and their interdisciplinary honours research project.

Students will enter the Joint Honours at the end of their U1 year, and will be required to maintain a PGPA of 3.30 and an overall CGPA of 3.0. Whereas the Faculty Program Environment Honours requires the student to undertake a Minor as well, the Joint Honours Environment component does not.

This program comprises 36 credits, including: Honours research (6 credits); Environment core (21 credits); statistics (3 credits); and complementary courses (6 credits).

Program Prerequisites or Corequisites

The program corequisites (6-8 credits), which are common to the stand-alone Environment Honours program, are in addition to the overall credit account. Students are required to complete these courses by the end of their U1 year.

3 credits of Basic Science, one of the following, or their equivalents (e.g., CEGEP objectives Biology 00UK, Chemistry 00UL, Physics 00UR):

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

And one of the following:

3 credits of Calculus or equivalent (e.g., CEGEP objective 00UN):

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

Required Courses (21 credits)

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
ENVR 401	(3)	Environmental Research

Complementary Courses (15 credits)

Statistics

3 credits of statistics from the following (or equivalent):

GEOG 202	(3)	Statistics and Spatial Analysis
MATH 203	(3)	Principles of Statistics 1
PSYC 204	(3)	Introduction to Psychological Statistics

Honours Research

0-6 credits from the following:

ENVR 494	(3)	Joint Honours Research
ENVR 495D1	(3)	Honours Research
ENVR 495D2	(3)	Honours Research
ENVR 495N1	(3)	Honours Research
ENVR 495N2	(3)	Honours Research

Note: Students must complete 6 credits of honours research between the two components of the program. If the second component requires 0 credits of honours research, the student must take 6 credits of ENVR honours research. If the second component requires 3 credits of honours research, the student must take 3 credits of ENVR honours research. If the second component requires 6 credits of honours research, the student is not required to take any credits of ENVR honours research. Students may not count the same honours research credits towards both components.

6-12 credits chosen with approval of the Program Adviser. A maximum of 3 credits of these courses may be at 200 or 300 level.

7.8 Diploma in Environment

Program Adviser

Ms. Kathy Roulet
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Email: *kathy.roulet@mcgill.ca*

7.8.1 Diploma (Dip.) 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 and 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.

Advising Note:

Consultation with the Program Adviser for approval of course selection to meet program requirements is obligatory. All courses must be at the 200 level and above, and completed with a grade of C or better.

Required Courses (18 credits)

The core 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, 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 (12 credits)

12 credits of complementary courses are selected as follows:

3 credits - selected with the approval of the Program Adviser in an area outside of the student's previous degree (e.g., those with a B.A. or equivalent degree must take 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 - in an area of focus chosen by the student with the approval of the Program Adviser. At least 6 credits must be taken at the 400 level or higher. A list of Suggested Courses is given below.

Suggested Course List

The Suggested Course 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 exhaustive. You are 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 Course List may be included with the permission of the Program Adviser.

Some courses on the Suggested Course List may be subject to other regulations (e.g., the Restricted Courses List for Faculty of Science students). If in doubt, ask the Program Adviser.

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.

Social Sciences and Policy

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 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 418	(3)	Environment and Development
ANTH 512	(3)	Political Ecology
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
EDER 494	(3)	Human Rights and Ethics in Practice
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
ENVR 421	(3)	Montreal: Environmental History and Sustainability
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 310	(3)	Development and Livelihoods
GEOG 370	(3)	Protected Areas
GEOG 403	(3)	Global Health and Environmental Change
GEOG 408	(3)	Geography of Development
GEOG 423	(3)	Dilemmas of Development
GEOG 530	(3)	Global Land and Water Resources
HIST 249	(3)	Health and the Healer in Western History
HIST 292	(3)	History and the Environment
NRSC 221	(3)	Environment and Health
PHIL 221	(3)	Introduction to History and Philosophy of Science 2
PHIL 230	(3)	Introduction to Moral Philosophy 1
PHIL 237	(3)	Contemporary Moral Issues
PHIL 334	(3)	Ethical Theory
PHIL 341	(3)	Philosophy of Science 1

PHIL 343	(3)	Biomedical Ethics
PHIL 348	(3)	Philosophy of Law 1
POLI 212	(3)	Government and Politics - Developed World
POLI 227	(3)	Developing Areas/Introduction
POLI 345	(3)	International Organizations
POLI 350	(3)	Global Environmental Politics
POLI 412	(3)	Canadian Voting/Public Opinion
POLI 445	(3)	International Political Economy: Monetary Relations
POLI 474	(3)	Inequality and Development
PSYC 215	(3)	Social Psychology
RELG 270	(3)	Religious Ethics and the Environment
RELG 370	(3)	Religion and Human Rights
SOCI 222	(3)	Urban Sociology
SOCI 234	(3)	Population and Society
SOCI 235	(3)	Technology and Society
SOCI 254	(3)	Development and Underdevelopment
SOCI 307	(3)	Globalization
SOCI 365	(3)	Health and Development
SOCI 366	(3)	Neighborhoods and Inequality
SOCI 386	(3)	Contemporary Social Movements
URBP 201	(3)	Planning the 21st Century City
URBP 504	(3)	Planning for Active Transportation
URBP 506	(3)	Environmental Policy and Planning
URBP 530	(3)	Urban Infrastructure and Services in International Context
URBP 551	(3)	Urban Design and Planning
WCOM 314	(3)	Communicating Science

Natural Sciences and Technology

** Note: you may take LSCI 230 or MIMM 211, but not both; you may take ENVB 529 or GEOG 201, but not both; you may take one of BREE 217, CIVE 323 or GEOG 322; you may take BIOL 308 or ENVB 305, but not both; you may take BIOL 465 or WILD 421, but not both; you may take COMP 202 or COMP 204, but not both; you may take EPSC 201 or EPSC 233, but not both.

AGRI 340	(3)	Principles of Ecological Agriculture
ANSC 326	(3)	Fundamentals of Population Genetics
ANTH 311	(3)	Primate Behaviour and Ecology
ATOC 214	(3)	Introduction: Physics of the Atmosphere
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)	Global Change Biology of Aquatic Ecosystems
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 327	(3)	Bio-Environmental Engineering
BREE 518	(3)	Ecological Engineering
CHEM 212	(4)	Introductory Organic Chemistry 1
CHEM 281	(3)	Inorganic Chemistry 1
CIVE 225	(4)	Environmental Engineering
CIVE 323**	(3)	Hydrology and Water Resources
CIVE 550	(3)	Water Resources Management
COMP 202**	(3)	Foundations of Programming
COMP 204**	(3)	Computer Programming for Life Sciences
ENVB 210	(3)	The Biophysical Environment
ENVB 301	(3)	Meteorology
ENVB 305**	(3)	Population and Community Ecology
ENVB 410	(3)	Ecosystem Ecology
ENVB 415	(3)	Ecosystem Management
ENVB 529**	(3)	GIS for Natural Resource Management
ENVR 200	(3)	The Global Environment
ENVR 202	(3)	The Evolving Earth
ENVR 422	(3)	Montreal Urban Sustainability Analysis
EPSC 201**	(3)	Understanding Planet Earth
EPSC 233**	(3)	Earth and Life History
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)	Remote Sensing for Earth Observation
GEOG 321	(3)	Climatic Environments
GEOG 322**	(3)	Environmental Hydrology
GEOG 372	(3)	Running Water Environments
GEOG 470	(3)	Wetlands
GEOG 550	(3)	Historical Ecology Techniques
LSCI 230**	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology
MIME 320	(3)	Extraction of Energy Resources
MIMM 211**	(3)	Introductory Microbiology
MIMM 214	(3)	Introductory Immunology: Elements of Immunity
MIMM 323	(3)	Microbial Physiology
NRSC 333	(3)	Pollution and Bioremediation

PARA 410	(3)	Environment and Infection
PARA 515	(3)	Water, Health and Sanitation
PHYS 228	(3)	Energy and the Environment
PLNT 304	(3)	Biology of Fungi
PLNT 305	(3)	Plant Pathology
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
WILD 302	(3)	Fish Ecology
WILD 421**	(3)	Wildlife Conservation

7.9 Field Studies

Field study semesters are available in Africa, Barbados, and Panama. For details, see *Study Abroad & Field Studies* > *Undergraduate* > *: Field Study Semesters and Off-Campus Courses*.