



**Bieler School of Environment**  
**Programs, Courses and University Regulations**  
**2022-2023**



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

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7.4.2.2 Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bachelor of

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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-en

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Sainte-Anne-de-Bellevue, Quebec H9X 3V9  
Telephone: 514-398-7559  
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### 3.2 Administrative Officers

#### Administrative Officers

Anja Geitmann	<b>Dean, Faculty of Agricultural and Environmental Sciences</b>
Antonia Maioni	<b>Dean, Faculty of Arts</b>
R. Bruce Lennox	<b>Dean, Faculty of Science</b>
Frederic Fabry	<b>Director</b>
Sylvie de Blois	<b>Chair, Graduate Affairs</b>
Julia Freeman	<b>Chair, Undergraduate Affairs</b>
Kathryn Roulet	<b>Program Adviser</b>

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### 3.3 Environment Faculty

#### Director

Frédéric Fabry

#### Professors

Elena Bennett; Peter G. Brown; Iwao H4m/F1 8.1 T





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## 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.**

- 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 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](http://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](#).

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## 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. F

## 7 Browse Academic Programs

The programs and courses in the following sections have been approved for the 2022-2023 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](mailto: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

Environmental Thoane 307.922 Tm32 38864 323.622 Tm(Thoa)

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





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

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 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
		Philosoph

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

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## 7.2 B.A. Faculty Program in Environment

The B.A. Faculty Program comprises two course components: Core and Domain.

**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 27students to dil'ok be



ENVR 301

- (3) Environmental Research Design
- (3) Environmental Thought

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.

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 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
URBP 520	(3)	Globalization: Planning and Change

### **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.

Research in Society and De

### 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](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](mailto: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
AGRI 519	(6)	Sustainable Development Plans
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama

**Domain: Required Courses (15 credits)**

ECON 230D1	(3)	Microeconomic Theory
ECON 230D2	(3)	Microeconomic Theory
ECON 405	(3)	Natural Resource Economics
EPSC 210	(3)	Introductory Mineralogy
EPSC 240	(3)	Geology in the Field

**Domain:**

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

Montreal: En

**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](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](mailto: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
AGRI 519	(6)	Sustainable Development Plans
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama

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

ANTH 339	(3)	Ecological Anthropology
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ECON 313	(3)	Economic Development 1
ECON 314	(3)	Economic Development 2
GEOG 302	(3)	Environmental Management 1



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### 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](mailto: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.g1001131.7278.3](mailto:advisor.g1001131.7278.3)





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
EPSC 201	(3)	Understanding Planet Earth
GEOG 272	(3)	Earth's Changing Surface
GEOG 305	(3)	Soils and Environment
GEOG 321	(3)	Climatic Environments
SOIL 326	(3)	Soils in a Changing Environment

**Area 7: Economics**

\* Note: You may take AGECE 200 or ECON 208, but not both.

AGECE 200*	(3)	Principles of Microeconomics
AGECE 333	(3)	Resource Economics
ECON 208*	(3)	Microeconomic Analysis and Applications
ECON 326	(3)	Ecological Economics

ECON 347	(3)	Economics of Climate Change
ECON 405	(3)	Natural Resource Economics
GEOG 216	(3)	Geography of the World Economy

**Area 8: Development and Underdevelopment**

ANTH 212	(3)	Anthropology of Development
ANTH 418	(3)	Environment and Development
ECON 313	(3)	Economic Development 1
ECON 314	(3)	Economic Development 2
GEOG 408	(3)	Geography of Development
GEOG 410	(3)	Geography of Underdevelopment: Current Problems
POLI 227	(3)	Developing Areas/Introduction
POLI 445	(3)	International Political Economy: Monetary Relations

**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 340	()	
RELG 370	(3)	Religion and Human Rights

**Area 12: Environmental Management**

AGRI 435	(3)	Soil and Water Quality Management
AGRI 452	(3)	Water Resources in Barbados
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
NRSC 333	(3)	Pollution and Bioremediation
WILD 401	(4)	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: [Michelle Maillet](mailto:Michelle.Maillet@umontreal.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.

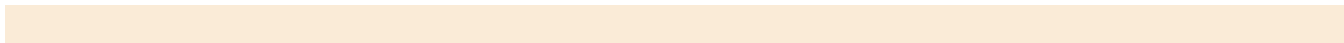
Students in the Faculty of Agricultural and Environmental Sciences B.Sc.(Ag.Env.Sc.) program and students in the Faculty of Science B.Sc. program can register in the Major in Environment.

The Major comprises two course components: Core and Domain.

**1. Core:**

#### **7.4.1 Biodiversity and Conservation Domain**

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



42-43 credits of complementary courses are selected as follows:

9 credits - basic courses in the Biological Principles of Diversity, Systematics, and Conservation

3 credits - Ecology

3 credits - Statistics

9 credits - Interface between Science, Policy, and Management

3-4 credits - Field Courses

6 credits - General Scientific Principles

3 credits - Social Science

6 credits - Organisms and Diversity

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

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

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

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

**Science, Policy, and Management:**

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

\* Note: You may take AGECE 200 or ECON 208, but not both.

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

AEBI 423	(3)	Sustainable Land Use
AGECE 200*	(3)	Principles of Microeconomics

AGRI 550	(3)	Sustained Tropical Agriculture
ANTH 418	(3)	Environment and Development
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 415	(3)	Ecosystem Management
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 302	(3)	Environmental Management 1
GEOG 360	(3)	Analyzing Sustainability
GEOG 408	(3)	Geography of Development
GEOG 410	(3)	Geography of Underdevelopment: Current Problems
NRSC 451**	(3)	Research in Ecology and Development in Africa
PLNT 312	(3)	Urban Horticulture
URBP 507	(3)	Planning and Infrastructure

**Field Courses**

3-4 credits from:

W

BIOL 342	(3)	Global Change Biology of Aquatic Ecosystems
BIOL 432	(3)	Limnology
BIOL 434	(3)	Theoretical Ecology Biological Oceanography



BIOL 355	(3)	Trees: Ecology and Evolution
BIOL 427	(3)	Herpetology
BIOL 540**	(3)	Ecology of Species Invasions
ENTO 330*	(3)	Insect Biology
ENTO 350*	(3)	Insect Biology and Control
ENTO 352	(3)	Biocontrol of Pest Insects
ENVR 540**	(3)	Ecology of Species Invasions
PARA 424	(3)	Fundamental Parasitology
PLNT 304	(3)	Biology of Fungi
	(3)	Weed Biology and Control

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

**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
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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 Ov



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 may take BIOL 451 or NRSC 451, but not both.

AEBI 421 (3) Tropical Horticultural Ecology  
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

**Bachelor of Science (Agricultural and Environmental Sciences) (B.Sc.(Ag.Env.Sc.)) or Bac**

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

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

PARA 410	(3)	Environment and Infection
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**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
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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 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)	Research in Ecology and Development in Africa Conservation Biology

Ecology of Species Invasions 35j1 0 0 1 165.785 197.185 Tm((3))Tj1 0 0 1 70UTR 307

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 452	(3)	Water Resources in Barbados
AGRI 550	(3)	Sustained Tropical Agriculture
BREE 217*	(3)	Hydrology and Water Resources
GEOG 321	(3)	Climatic Environments
GEOG 322*	(3)	Environmental Hydrology

**Decision Making, Techniques and Management**

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

AEBI 423	(3)	Sustainable Land Use
AGECE 200*	(3)	Principles of Microeconomics
AGECE 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 404	(3)	Environmental Management 2
PHIL 343	(3)	Biomedical Ethics
URBP 507	(3)	Planning and Infrastructure

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

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 e

**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
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
	(3)	Soils and Environment

And one of:

AEMA 411

(3)

Experimental Designs 01

(3)

Environmental Data Analysis

#### 7.4.4 Food Production and Environment Domain

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

Adviser	Mentor
Ms. Kathy Roulet Telephone: 514-398-4306 Email: <a href="mailto:kathy.roulet@mcgill.ca">kathy.roulet@mcgill.ca</a>	Professor Caroline Begg Telephone: 514-398-8749 Email: <a href="mailto:caroline.begg@mcgill.ca">caroline.begg@mcgill.ca</a>

##### 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 Kath

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

**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



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	(4)	Fisheries and Wildlife Management
WILD 421*	(3)	Wildlife Conservation

**Social Science (6 credits)**

**Economic and Resource Policy**

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

AGECE 320	(3)	Intermediate Microeconomic Theory
AGECE 333*	(3)	Resource Economics
AGECE 430	(3)	Agriculture, Food and Resource Policy
AGECE 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 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 Domain**

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



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**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, CO<sub>2</sub>, and methane) is controlled by complex processes operating at the land surface, involving climate change feedbacks that need to be fully understood, given current global warming trends.

The program introduces students to the interacting physical and biogeochemical processes at the atmosphere-lithosphere interface, which fashion land surface habitats and determine their biological productivity and response to anthropogenic or natural environmental changes. Through an appropriate selection of courses, students can prepare for graduate training in emerging research areas such as earth system sciences, environmental hydrology, and landscape ecology.

**Suggested First Year (U1) Cour**

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
ENVB 301	(3)	Meteorology

### **Fundamental Land Surface Processes**

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

0-3 credits chosen from:

7EOG 202 (3)

**Environment and Resource Management:**

3 credits from:

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

AGRI 452	(3)	Water Resources in Barbados
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 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 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

7.4.6 230 324 284 150 2 Resource Management and Planning 1 j 1 0 0 1 700e2 SOIL 535a Tm(Tj Bennig tB.Sc.(Ag.ntal Soil Chemi49.9 535



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 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 AGECE 333 and ECON 405, but not both.

AGECE 242	(3)	Management Theories and Practices
AGECE 333*	(3)	Resource Economics
ANTH 339	(3)	Ecological Anthropology
CANS 407	(0)	
ECON 405*	(3)	Natural Resource Economics
ENVR 421	(3)	Montreal: Environmental History and Sustainability
GEOG 382	(3)	Principles Earth Citizenship
GEOG 498	(3)	Humans in Tropical Environments
RELG 270	(3)	Religious Ethics and the Environment
URBP 520	(3)	Globalization: Planning and Change

### **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
		Fisheries and

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**Bachelor of Science (Agricultural and Envir**



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

(3) Biometry

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
GEOG 495	(3)	Field Studies - Physical Geography
WILD 401	(4)	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

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	(4)	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
		Advances in Aquatic Ecology

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
AGRI 519	(6)	Sustainable Development Plans
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama
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 - Statistista-7j1im(v e(3))Tj1 0 0 1 70.56lopment Plans)Tj1 0 0 1 Tm2cCalculuv e(3))Tj1 0 0 1 734R 4opment Plans3)

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:

AGRI 452	(3)	Water Resources in Barbados
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
GEOG 495	(3)	Field Studies - Physical Geography
WILD 401	(4)	Fisheries and Wildlife Management

### **List A: (Engineering/Math/Hydrology)**

6-9 credits chosen from:

\* Note: You can take 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.

ATO0 0 4.9 not both.	(3)	Weather Radars and Satellites
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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
		Remote Sensing for Earth Observation

## 7.5.1 Atmospheric Environment and Air Quality Domain

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 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 Domain**

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

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**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](mailto: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.

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

**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



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## 7.6 Honours Program in Environment

### Adviser

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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 CGP

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).

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**7.7 Joint Honours Component Environment**



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





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

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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

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## 7.9 Field Studies

Field study semesters are available in Africa, the Canadian Arctic, Barbados, and Panama. For details, see [Study Abroad & Field Studies > Undergraduate > : Field Study Semesters and Off-Campus Courses](#). In addition, the Bieler School of Environment offers the Montreal Urban Sustainability Experience (M.U.S.E.), a 6 credit field program offered in Montreal. For further details, see: [mcgill.ca/environment/montreal-urban-sustainability-experience](https://mcgill.ca/environment/montreal-urban-sustainability-experience).