



McGill School of Environment
Programs, Courses and University Regulations
2018-2019

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

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1 About the McGill School of Environment

McGill's Faculties of Agricultural and Environmental Sciences, Arts, Science, and Law have forged a unique approach to the study of environment through the inter-faculty, trans-disciplinary McGill School of Environment (MSE).

The growth of technology, globalizing economies, and rapid increase in population have had dramatic and significant environmental impacts. These changes have been accompanied by an increasing awareness of the relationship between human activity and the environment. Environmental problems range from local and short-term degradation through to the perturbation observed over the entire globe and for many years. The importance of human-environment relations for environmental and social well-being, and the complexity and conflict involved in environmental analysis and decision making, requires a depth and breadth of knowledge. The MSE has developed its programs with the approach of introducing students to a broad range of ideas early in the program to provide a foundation and an openness upon which more specialized, disciplinary knowledge can be built.

2 Mission of the School

The mission of the McGill School of Environment is:

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

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

The MSE focuses on four themes:

- Health in a Changing Environment
- Ecosystems, Biodiversity, and Conservation
- Citizens, Communities, In1 2anvions and the en

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3.2 Administrative Officers

Administrative Officers

Anja Geitmann; Diplom(Konstanz), Ph.D.(Siena)	Dean, Faculty of Agricultural and Environmental Sciences
Antonia Maioni; B.A.(Laval), M.A.(Car.), Ph.D.(N'western)	Dean, Faculty of Arts
Robert Leckey; B.A.(Hons.)(Qu.), B.C.L./LL.B.(McG.), S.J.D.(Tor.)	Dean, Faculty of Law
R. Bruce Lennox; B.Sc., M.Sc., Ph.D.(Tor.)	Dean, Faculty of Science
Sylvie de Blois; B.Sc.(McG.), M.Sc., Ph.D.(Montr.)	Director and Chair, Graduate Affairs
Julia Freeman; B.A.(S. Fraser), M.A.(McG.), Ph.D.(Br. Col.)	Chair, Undergraduate Affairs
Kathryn Roulet; B.Sc.(Trent), M.Sc.(Guelph)	Program Adviser

3.3 Environment Faculty

Director

Sylvie de Blois; B.Sc.(McG.), M.Sc., Ph.D.(Montr.)

Professors

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

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

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

Associate Professors

Madhav Badami; B.Tech., M.S.(IIT), M.E.Des.(Calg.), Ph.D.(Br. Col.) (*joint appt. with School of Urban Planning*)

Christopher Barrington-Leigh; S.M.(MIT), Ph.D.(Stan.), Ph.D.(Br. Col.) (*joint appt. with Institute for Health and Social Policy*)

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

Jeffrey Cardille; B.Sc.(Carn. Mell), M.Sc.(Georgia Tech.), M.Sc., Ph.D.(Wisc.) (*joint appt. with Natural Resource Sciences*)

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

Associate Professors

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

Assistant Professor

Kevin Manaugh; B.A.(Naropa), M.U.P., Ph.D.(McG.) (*joint appt. with Geography*)

Hamish van der Ven; B.A., M.A.(Br. Col.), Ph.D.(Tor.) (*joint appt. with Political Science*)

Faculty Lecturers

Julia Freeman; B.A.(S. Fraser), M.A.(McG.), Ph.D.(Br. Col.)

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

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

Associate Members

Anthropology: John Galaty

Architecture, School of: Nik Luka

Atmospheric and Oceanic Sciences: Parisa Ariya

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

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

Chemical Engineering: Nathalie Tufenkji, Viviane Yargeau

Chemistry: Christopher Barrett

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

Earth and Planetary Sciences: Jeanne Paquette

Economics: Chris Green, Tom Naylor

Electrical and Computer Engineering: Geza Joos

Epidemiology, Biostatistics, and Occupational Health: Jonathan Chevrier, Mark Goldberg

Geography: Gail Chmura, Oliver Coomes, Graham MacDonald, Thom Meredith, Tim Moore, Wayne H. Pollard, Brian Robinson, Nancy Ross, Nigel Roulet

History and Classical Studies: Daviken Studnicki-Gizbert

Human Nutrition, School of: Niladri Basu

Languages, Literatures, and Cultures: Stephanie Posthumus

Law, Faculty of: Richard Gold, Richard Janda, Hoi Kong

Management, Desautels Faculty of: Dror Etzion, Steve Maguire

Natural Resource Sciences: Christopher Buddle, Benoit Cote, Jim W. Fyles, Gordon Hickey, Ian Strachan, Paul Thomassin, Joann Whalen

Parasitology, Institute of: Marilyn Scott

Pathology: Bruce Case

Plant Science: Caroline Begg, Pierre Dutilleul, Don Smith

Political Science: Philip Oxhorn

Redpath Museum: David M. Green

Urban Planning

4 Admission, Registration, and Regulations

Information concerning admission to the McGill 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: Advising in the MSE

section 4.4: Important Information about Program Selection

section 4.5: Examination Regulations

section 4.6: 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 MSE on the University's two campuses: the Macdonald campus (B.Sc.(Ag.Env.Sc.) program) and the Downtown campus (B.A., B.A.&Sc., and B.Sc. programs). You register as a student within your faculty of admission and are governed by all rules and reon,

4.4 Important Information about Program Selection

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



Note: You must select a domain in order to graduate.

(This section does not apply to students in the B.A.&Sc., Minor, or Diploma programs.)

4.5 Examination Regulations

Regulations concerning the method of evaluation of any course (including those governing supplemental examinations) are those of the faculty that offers the course. 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](#).

4.6 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 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 www.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 McGill School of Environment has developed nine programs, which are offered on the Downtown and Macdonald campuses:

1. A **Minor in Environment** is open to all undergraduate students. For more information, see [section 7.1: 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. & Sc. is offered by the McGill School of Environment in partnership with the Department of Geography. It is open to students meeting the entrance requirements for the Bachelor of Arts and Science. For more information, see [Bachelor of Arts and Science > Undergraduate](#)

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 trans-disciplinary area of environmental specialization, referred to as a domain.

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

6 Suggested Courses for Freshmen Students

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

- Students in the **B.Sc.** degree, see www.mcgill.ca/science/student/newstudents/u0/bscfreshman/specific.
- Students in the **B.Sc.(Ag.Env.Sc.)** degree, see www.mcgill.ca/macdonald/prospective/freshmanyenar/courses.
- Students in the **B.A. & Sc.**326J.475 T3.

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

For more information, contact:

Ms. Kathy Roulet, MSE Program Adviser

Email: kathy.roulet@mcgill.ca

Telephone: 514-398-4306

Complementary Courses (18 credits)

18 credits of complementary courses are selected as follows:

12 credits of MSE core courses:

Location Note: Core courses are taught at both McGill's Downtown campus and at the Macdonald campus in Sainte-Anne-de-Bellevue. You should register in Section 001 of an ENVI be appro

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
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 Geographical Perspectiv

SOCI 254	(3)	Development and Underdevelopment
SOCI 386	(3)	Contemporary Social Movements
URBP 201	(3)	Planning the 21st Century City
URBP 506	(3)	Environmental Policy and Planning
URBP 530	(3)	Urban Infrastructure and Services in International Context
WILD 415*	(2)	Conservation Law

Natural Sciences and Technology

** Note: you may take MIMM 211 or LSCI 230, but not both; you may take ENVB 315 or BIOL 432, but not both; you may take BIOL 308 or ENVB 305, but not both.

AGRI 340	(3)	Principles of Ecological Agriculture
AGRI 435	(3)	Soil and Water Quality Management
ANSC 326	(3)	Fundamentals of Population Genetics
ANTH 311	(3)	Primate Behaviour and Ecology
ARCH 375	(2)	Landscape
ARCH 377	(3)	Energy, Environment and Buildings
ARCH 378	(3)	Site Usage
ATOC 215	(3)	Oceans, Weather and Climate
BIOL 240	(3)	Monteregian Flora
BIOL 305	(3)	Animal Diversity
BIOL 308**	(3)	Ecological Dynamics
BIOL 310	(3)	Biodiversity and Ecosystems
	c Ecology	Contemporary Topics in Aquatic 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
EPSC 201	(3)	Understanding Planet Earth
EPSC 233	(3)	Earth and Life History
EPSC 425	(3)	Sediments to Sequences
EPSC 549	(3)	Hydrogeology
ESYS 301	(3)	Earth System Modelling
GEOG 200	(3)	Geographical Perspectives: World Environmental Problems
GEOG 201	(3)	Introductory Geo-Information Science
GEOG 205	(3)	Global Change: Past, Present and Future
GEOG 272	(3)	Earth's Changing Surface
GEOG 308	(3)	Principles of Remote Sensing
GEOG 321	(3)	Climatic Environments
GEOG 322	(3)	Environmental Hydrology
GEOG 372	(3)	Running Water Environments
GEOG 470	(3)	Wetlands
LSCI 230**	(3)	Introductory Microbiology
MICR 331	(3)	Microbial Ecology
MIME 308	(3)	Social Impact of Technology
MIME 320	(3)	Extraction of Energy Resources
MIMM 211**	(3)	Introductory Microbiology
MIMM 314	(3)	Intermediate Immunology
MIMM 323	(3)	Microbial Physiology
MIMM 324	(3)	Fundamental Virology
NRSC 333	(3)	Pollution and Bioremediation
NRSC 340	(3)	Global Perspectives on Food
NRSC 510	(3)	Agricultural Micrometeorology
NRSC 514	(3)	Freshwater Ecosystems
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 426	(3)	Plant Ecophysiology
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
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.

Advising Note:

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

For more information, contact:

Ms Kathy Roulet, MSE Program Adviser

Email: Kathy.roulet@mcgill.ca

Telephone: 514-398-4306

Complementary Courses (18 credits)

18 credits of complementary courses are selected as follows:

12 credits of MSE core courses:

Location Note: MSE core 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 Society, En
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ANTH 339	(3)	Ecological Anthropology
ANTH 418	(3)	Environment and Development
ANTH 512	(3)	Political Ecology
BREE 503	(3)	Water: Society, Law and Policy
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
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 302vut	(3)	Environmental Management 1

RELG 340	(3)	Religion and the Sciences
RELG 370	(3)	Religion and Human Rights
RELG 376	(3)	Religious Ethics
SOCI 222	(3)	Urban Sociology
SOCI 234	(3)	Population and Society
SOCI 235	(3)	Technology and Society
SOCI 254	(3)	Development and Underdevelopment
SOCI 386	(3)	Contemporary Social Movements
URBP 201	(3)	Planning the 21st Century City
URBP 506	(3)	Environmental Policy and Planning
URBP 530	(3)	Urban Infrastructure and Services in International Context
URBP 551	(3)	Urban Design and Planning
WILD 415*	(2)	Conservation Law

Natural Sciences and Technology

* Note: you may take LSCI 230 or MIMM 211, but not both; you may take BIOL 432 or ENVB 315, but not both; you may take BREE 217 or GEOG 322, but not both; you may take ENVB 430 or GEOG 201, but not both; you may take BIOL 308 or ENVB 305, but not both.

AGRI 340	(3)	Principles of Horticulture
AGRI 435	(3)	Soil and Water Quality Management
ANSC 326	(3)	Fundamentals of Population Genetics
ANTH 0 w/F121.94t13 0 814.(7) 5dF Tm(AgricPrtms)Tch94103r08854-036.92 Tm((2))Tj1.94t13 0 81AL144t13 0 81864 536.92 t13 0 81AL144I23 iM461.941Enrm(E		

PLNT 358	(3)	Flowering Plant Diversity
PLNT 426	(3)	Plant Ecophysiology
PLNT 460	(3)	Plant Ecology
SOIL 300	(3)	Geosystems
WILD 421	(3)	Wildlife Conservation

7.2 B.A. Faculty Program in Environment

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

- 1. Core:** The Core consists of four introductory courses and one intermediate-level course where students are exposed to the different approaches, perspectives, and world views that will help them gain an understanding of the complexity and conflicts that underlie most environmental problems. Through the core program, students go beyond the confines of their individual views of environment.
- 2. Domain:** Domains provide a trans-disciplinary study of a particular theme or component of the environment. You can choose to follow one of three domains within the B.A. Faculty Program in Environment:
 - Ecological Determinants of Health in Society
 - Economics and the Earth's Environment
 - Environment and Development
- 3. Senior Core and Resear**

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 "MSE Student Handbook" available on the MSE website (<http://www.mcgill.ca/mse>), 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
AGRI 519	(6)	Sustainable Development Plans
ENVR 401	(3)	Environmental Research
ENVR 451	(6)	Research in Panama

Complementary Courses (33 credits)

33 credits of complementary courses are chosen as follows:

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
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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)

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 & 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
CHEE 230	(3)	Environmental Aspects of Technology
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 al of

MIMM 413*	(3)	Parasitology
PARA 438	(3)	Immunology
PPHS 501	(3)	Population Health and Epidemiology
WILD 424*	(3)	Parasitology

Populations and Place

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 "MSE Student Handbook" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Ms. Kathy Roulet, the Program Adviser (kathy.roulet@mcgill.ca).

Program Requirements

Note: Students are required to take a maximum of 34 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes core and required courses, but does not include the 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: 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.

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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.

AGRI 452	(3)	Water Resources in Barbados
BIOL 308*	(3)	Ecological Dynamics
BREE 217*	(3)	Hydrology and Water Resources
ENVB 305*	(3)	Population & 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 Domain

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

Adviser	Mentor
Ms. Kathy Roulet Telephone: 514-398-4306 Email: kathy.roulet@mcgill.ca	Prof. Gregory Mikkelson Telephone: 514-398-4583 Email: gregory.mikkelson@mcgill.ca

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

Revision, May 2018. Start of revision.

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 "MSE Student Handbook" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Ms. Kathy Roulet, the Program Adviser (kathy.roulet@mcgill.ca).

Program Requirements

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

Location Note: When planning 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 must 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, Environment and Society
ENVR 301	(3)	Environmental Science and Policy
ENVR 400	(3)	Environmental Science and Policy

may also count as electives.

ENVR 401	(6)	Barbados Interdisciplinary Project
ENVR 402	(6)	Sustainable Development Plans
ENVR 403	(3)	Environmental Research

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GEOG 202

- (3) Statistics and Spatial Analysis
- (3) Principles of Statistics 1

ANTH 451	(3)	Research in Society and Development in Africa
CANS 407	(3)	Regions of Canada
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 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)
MGPO 440	(3)	Strategies for Sustainability
NRSC 221*	(3)	Environment and Health
POLI 445	(3)	International Political Economy: Monetary Relations
URBP 507	(3)	Planning and Infrastructure

Revision, May 2018. End of revision.

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

These Interf

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

Prof. Graham MacDonald

Email: graham.macdonald@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.

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

Statistics:

One of:

AEMA 310	(3)	Statistical Methods 1
BIOL 373	(3)	Biometry
GEOG 202	(3)	Statistics and Spatial Analysis

MATH 203	(3)	Principles of Statistics 1
PSYC 204	(3)	Introduction to Psychological Statistics

Areas:

30 credits from at least 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 & 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 355	(3)	Trees: Ecology & Evolution
BIOL 427	(3)	Herpetology
BIOL 465	(3)	Conservation Biology
ENTO 440	(3)	Insect Diversity
MICR 331	(3)	Microbial Ecology
PLNT 358	(3)	Flowering Plant Diversity
WILD 307	(3)	Natural History of Vertebrates
WILD 350	(3)	Mammalogy
WILD 420	(3)	Ornithology

Area 3: Field Studies in Ecology and Conservation

BIOL 240	(3)	Monteregian Flora
BIOL 331	(3)	Ecology/Behaviour Field Course
BIOL 334	(3)	Applied Tropical Ecology
BIOL 553	(3)	Neotropical Environments
GEOG 495	(3)	Field Studies - Physical Geography
GEOG 499	(3)	Subarctic Field Studies
WILD 475	(3)	Desert Ecology

Area 4: Hydr

BREE 217*	(3)	Hydrology and Water Resources
CIVE 323*	(3)	Hydrology and Water Resources
EPSC 549	(3)	Hydrogeology
GEOG 322*	(3)	Environmental Hydrology Running Water Environments

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	(3)	Religion and the Sciences
RELG 370	(3)	Religion and Human Rights

Area 12: Environmental Management

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

AGRI 210	(3)	Agro-Ecological History
AGRI 435	(3)	Soil and Water Quality Management
AGRI 452	(3)	Water Resources in Barbados
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
WILD 415*	(2)	Conservation Law
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:

Prof. Graham Macdonald

Email: graham.macdonald@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 \(54 credits\)](#).

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

Suggested First Year (U1) Courses

For suggestions on courses to take in your first year (U1), you can consult the "MSE Student Handbook" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Kath

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 & 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:

AGRI 452	(3)	Water Resources in Barbados
BIOL 240	(3)	Monteregian Flora
BIOL 331	(3)	Ecology/Behaviour Field Course
BIOL 334	(3)	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
GEOG 499	(3)	Subarctic Field Studies
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology
WILD 401	(4)	Fisheries and Wildlife Management
WILD 475	(3)	Desert Ecology
WOOD 441	(3)	Integrated Forest Management

General Scientific Principles

6 credits of general scientific principles selected from the following:

* Note: You may take only one of BREE 529, ENVB 529 or GEOG 306.

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

*** Note: You may take ANSC 326 or BIOL 324, but not both.

ANSC 326***	(3)	Fundamentals of Population Genetics
		ic Genetics Basic Genetics

LSCI 204	(3)	Genetics
MICR 331	(3)	Microbial Ecology

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

Social Science:

3 credits from:

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

AGEC 333	(3)	Resource Economics
AGRI 411	(3)	Global Issues on Development, Food and Agriculture
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
ENVR 519	(3)	Global Environmental Politics
GEOG 404	(3)	Environmental Management 2
GEOG 451*	(3)	Research in Society and Development in Africa
GEOG 498	(3)	Humans in Tropical Environments
URBP 520	(3)	Globalization: Planning and Change

Organisms and Diversity:

6 credits of organisms and diversity selected as follows:

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

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

AEBI 421	(3)	Tropical Horticultural Ecology
AGRI 340	(3)	Principles of Ecological Agriculture
ANTH 311	(3)	Primate Behaviour and Ecology
BIOL 310	(3)	Biodiversity and Ecosystems
BIOL 350*	(3)	Insect Biology and Control
BIOL 355	(3)	Trees: Ecology & Evolution
BIOL 427	(3)	Herpetology
BIOL 540**	(3)	Ecology of Species Invasions
ENTO 330*	(3)	Insect Biology
ENTO 350*	(3)	Insect Biology and Control
ENTO 352	(3)	Biocontrol of Pest Insects
ENTO 440	(3)	Insect Diversity
ENVR 540**	(3)	Ecology of Species Invasions
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 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: kathy.roulet@mcgill.ca	Professor Marilyn Scott Telephone: 514-398-7996 Email: marilyn.scott@mcgill.ca

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.

ENVR 451

(6)

Research in Panama

Domain: Required Cour

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.

AGRI 452	(3)	Water Resources in Barbados
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
CHEE 230	(3)	Environmental Aspects of Technology
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis
GEOG 302	(3)	Environmental Management 1
NUTR 450	(3)	Research Methods: Human Nutrition
URBP 507	(3)	Planning and Infrastructure

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 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

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 "MSE Student Handbook" av

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
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 either course.

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)	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 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
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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 Domain

Note: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes core and required courses.

Location Note: When planning their schedule and re

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:

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

List 2

3 credits minimum of environmental sciences chosen from:

AGRI 452	(3)	Water Resources in Barbados
AGRI 550	(3)	Sustained Tropical Agriculture
BIOL 331	(3)	Ecology/Behaviour Field Course
BIOL 553	(3)	Neotropical Environments
ENVB 313	(3)	Phylogeny and Biogeography
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	(4)	Fisheries and Wildlife Management
WOOD 420	(3)	Environmental Issues: Forestry

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: kathy.roulet@mcgill.ca	Professor Caroline Begg Telephone: 514-398-8749 Email: caroline.begg@mcgill.ca

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,

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 & 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

Revision, May 2018. Start of revision.

* 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

FDSC 535	(3)	Food Biotechnology
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

Revision, May 2018. End of revision.

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 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
AGRI 452	(3)	Water Resources in Barbados
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	(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

Montreal: En

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 "MSE Student Handbook" available on the MSE website (<http://www.mcgill.ca/mse>), or contact Kathy Roulet, the Program Adviser (kathy.roulet@mcgill.ca).

Program Requirements

Note: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes core and required courses.

Location Note: Whenj-0.0 0 19goses 8aroure and phesr.0 Of, or courses, studentsenhlder v.g

ases .803 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
GEOG 202	(3)	Statistics and Spatial Analysis
MATH 203	(3)	Principles of Statistics 1

GIS and Remote Sensing Techniques

One of:

ENVB 529	(3)	GIS for Natural Resource Management
GEOG 201	(3)	Introductory Geo-Information Science
GEOG 308	(3)	Principles of Remote Sensing

Weather and Climate

One of:

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

Fundamental Land Surface Processes:

9 credits of fundamental land surface processes chosen as follows:

GEOG 321	(3)	Climatic Environments
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And/or one of:

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

And/or one of:

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

And/or one of:

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

Environment and Resource Management:

One of:

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

AGRI 435	(3)	Soil and Water Quality Management
AGRI 452	(3)	Water Resources in Barbados
AGRI 550	(3)	Sustained Tropical Agriculture
BIOL 308*	(3)	Ecological Dynamics

BIOL 465	(3)	Conservation Biology
CHEE 230	(3)	Environmental Aspects of Technology
CIVE 225	(4)	Environmental Engineering
ENVB 305*	(3)	Population & Community Ecology
ENVB 437	(3)	Assessing Environmental Impact
ENVR 422	(3)	Montreal Urban Sustainability Analysis
ESYS 301	(3)	Earth System Modelling
GEOG 302	(3)	Environmental Management 1
GEOG 404	(3)	Environmental Management 2
WILD 421	(3)	Wildlife Conservation
WOOD 420	(3)	Environmental Issues: Forestry
WOOD 441	(3)	Integrated Forest Management

Field Course:

One of:

BIOL 553	(3)	Neotropical Environments
GEOG 495	(3)	Field Studies - Physical Geography
GEOG 496	(3)	Geographical Excursion
GEOG 499	(3)	Subarctic Field Studies
WILD 475	(3)	Desert Ecology

Social Science:

One of:

AGEC 333	(3)	Resource Economics
ANTH 339	(3)	Ecological Anthropology
ECON 225	(3)	Economics of the Environment
ECON 326	(3)	Ecological Economics
ECON 405	(3)	Natural Resource Economics
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
NRSC 221	(3)	Environment and Health
URBP 520	(3)	Globalization: Planning and Change

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

List A - Particular Environments:

3-9 credits of advanced study of Particular Environments:

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

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

GEOG 350	(3)	Ecological Biogeography
GEOG 372	(3)	Running Water Environments
GEOG 470	(3)	Wetlands
GEOG 536	(3)	Geocryology
GEOG 550	(3)	Historical Ecology Techniques
PLNT 358	(3)	Flowering Plant Diversity
PLNT 460	(3)	Plant Ecology

List B - Surface Processes:

3-9 credits advanced study of Surface Processes:

ATOC 315	(3)	Thermodynamics and Convection
BREE 509	(3)	Hydrologic Systems and Modelling
EPSC 549	(3)	Hydrogeology
EPSC 580	(3)	Aqueous Geochemistry
GEOG 501	(3)	Modelling Environmental Systems
GEOG 505	(3)	Global Biogeochemistry
GEOG 537	(3)	Advanced Fluvial Geomorphology
NRSC 333	(3)	Pollution and Bioremediation
SOIL 331	(3)	Environmental Soil Physics
SOIL 510	(3)	Environmental Soil Chemistry

7.4.6 Renewable Resource Management Domain

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

Adviser	Mentor
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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 af

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

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

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

Suggested First Year (U1) Courses

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

Program Requirements

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

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

Core: Required Courses (18 credits)

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

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

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

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

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

Domain: Complementary Courses (42 credits)

42 credits of complementary courses are selected as follows:

9 credits - Basic 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 & 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 may take BIOL 432 or ENVB 315, but not both; 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 315*	(3)	Science of Inland Waters
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:

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

** 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	(3)	Regions of Canada
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
WILD 415*	(2)	Conservation Law

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	(4)	Fisheries and Wildlife Management Integrated F

Environment - Water Environments & Ecosystems - Biological (60 credits)

to educate students in both the ecological and physical f

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available on the MSE website

level or higher in this program.

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Domain: Complementary Courses (33 credits)

33 credits of complementary courses are selected as follows:

6 credits - Hydrology/Water Resources, Population/Community and Ecology

3 credits - Math and Statistics

3 credits - Field Course

3 credits - Social Sciences and Policy

18 credits chosen in total from List A and List B

Hydrology/Water Resources, Population/Community and Ecology:

6 credits selected as follows:

One of:

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

And one of:

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

Math and Statistics:

One of:

* Note: AEMA 310 or equivalent

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

Field Course:

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

AGRI 452	(3)	Water Resources in Barbados
BIOL 331	(3)	Ecology/Behaviour Field Course
GEOG 495	(3)	Field Studies - Physical Geography

Social Sciences and Policy:

One of:

AGEC 333	(3)	Resource Economics
ANTH 339	(3)	Ecological Anthropology
ANTH 418	(3)	Environment and Development
ECON 225	(3)	Economics of the Environment
ECON 326	(3)	Ecological Economics
ENVR 421	(3)	Montreal: Environmental History and Sustainability
ENVR 422	(3)	Montreal Urban Sustainability Analysis

GEOG 404	(3)	Environmental Management 2
GEOG 498	(3)	Humans in Tropical Environments
POLI 345	(3)	International Organizations
URBP 520	(3)	Globalization: Planning and Change

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

List A

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; you may take BIOL 432 or ENVB 315, but not both.

AGRI 435	(3)	Soil and Water Quality Management
BIOL 342	(3)	Contemporary Topics in Aquatic Ecology
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
BIOL 570	(3)	Advanced Seminar in Evolution
ENTO 535	(3)	Aquatic Entomology
ENVB 210*	(3)	The Biophysical Environment
ENVB 315*	(3)	Science of Inland Waters
ENVB 500	(3)	Advanced Topics in Ecotoxicology
ENVR 540*	(3)	Ecology of Species Invasions
GEOG 305*	(3)	Soils and Environment
GEOG 350	(3)	Ecological Biogeography
MICR 331	(3)	Microbial Ecology
NRSC 333	(3)	Pollution and Bioremediation
PARA 410	(3)	Environment and Infection
WILD 401	(4)	Fisheries and Wildlife Management

List B

6-9 credits chosen from:

* Note: you may take ATOC 219 or CHEM 219, but not both; you may take ATOC 519 or CHEM 519, but not both; you may take ENVB 529 or GEOG 201, but not both.

ATOC 219*	(3)	Introduction to Atmospheric Chemistry
ATOC 519*	(3)	Advances in Chemistry of Atmosphere
CHEM 219*	(3)	Introduction to Atmospheric Chemistry
CHEM 267	(3)	Introductory Chemical Analysis
CHEM 519*	(3)	Advances in Chemistry of Atmosphere
ENVB 529*	(3)	GIS for Natural Resource Management
EPSC 220	(3)	Principles of Geochemistry
GEOG 201*	(3)	Introductory Geo-Information Science
GEOG 308	(3)	Principles of Remote Sensing

GEOG 372	(3)	Running Water Environments
GEOG 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)

This concentration (60 credits including core) is open only to students in the B.Sc.(Ag.Env.Sc.) Major in Environment or B.Sc. Major in Environment program.

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

Students interested in studying the transport and transformation mechanisms of water on the planet, from rivers to the oceans and atmosphere, will select the Physical concentration. They will acquire, as well, a solid background in the biological processes taking place in water bodies. Those electing the Biological concentration will focus on the mechanisms regulating the different forms of life in water bodies. They will acquire, as well, a good understanding of the physical mechanisms controlling water properties.

Graduates of this domain are qualified to enter the work force or to pursue advanced studies in fields such as marine biology, geography, physical oceanography and atmospheric science.

Suggested First Year (U1) Courses

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

Program Requirements

Note: Students are required to take a maximum of 30 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes core and required courses.

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

Domain: Complementary Courses (30 credits)

30 credits of complementary courses are selected as follows:

GEOG 308	(3)	Principles of Remote Sensing
GEOG 537	(3)	Advanced Fluvial Geomorphology
NRSC 510	(3)	Agricultural Micrometeorology
URBP 520	(3)	Globalization: Planning and Change

And/or one of:

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

And/or one of:

BREE 506	(3)	Advances in Drainage Management
BREE 509	(3)	Hydrologic Systems and Modelling

And/or one of:

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

And/or one of:

ENVB 529	(3)	GIS for Natural Resource Management
GEOG 306	(3)	Raster Geo-Information Science

List B:

6 credits chosen from:

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

BIOL 342	(3)	Contemporary Topics in Aquatic Ecology
BIOL 432*	(3)	Limnology
BIOL 441	(3)	Biological Oceanography
BIOL 465	(3)	Conservation Biology
BIOL 553	(3)	Neotropical Environments
ENVB 315*	(3)	Science of Inland Waters
GEOG 350	(3)	Ecological Biogeography
GEOG 505	(3)	Global Biogeochemistry
WILD 401	(4)	Fisheries and Wildlife Management

7.5 Major in Environment – B.Sc.

In addition to the domains available to students in the Major program in either the Faculty of Science or the Faculty of Agricultural and Environmental Sciences, “Major in Environment - B.Sc.” students in the Faculty of Science can choose from one of the following two domains:

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

Refer to [section 7.4: Major in Environment – B.Sc.\(Ag.Env.Sc.\) and B.Sc.](#) for the general guidelines and regulations, which apply to all domains in the Major in Environment program.

7.5.1 Atmospheric Environment and Air Quality Domain

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

Adviser	Mentor
Ms. Kathy Roulet Telephone: 514-398-4306 Email: kathy.roulet@mcgill.ca	Professor Frédéric Fabry Telephone: 514-398-3652 Email: frederic.fabry@mcgill.ca

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 "MSE Student Handbook" available on the MSE website (<http://www.mcgill.ca/mse>).

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 of

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)	Principles of Remote Sensing

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
CHEE 230	(3)	Environmental Aspects of Technology
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)	Urban Activity, Air Pollution, and Health
COMP 208	(3)	Computers in 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
		Environment and Dev

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 of 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.

ENVR 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
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
	(3)	Mineral Deposits

SOIL 315	(3)	Soil Nutrient Management
SOIL 326	(3)	Soils in a Changing Environment
SOIL 535	(3)	Ecological Soil Management

7.6 Honours Program in Environment

Adviser

Ms. Kathy Roulet, MSE 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 En

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 MSE Program Adviser.

Honours Required Courses (6 credits)

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

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.

T

3. Students must earn a B grade (3.0) or higher for the Honours Research courses (ENVR 496 and ENVR 497).
4. Students are required to achieve a minimum overall CGPA of 3.0 at graduation, and a minimum Program GPA of 3.3 to obtain Honours.

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

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

Honours - Required Courses (6 credits)

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

7.7 Joint Honours Component Environment

Adviser

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

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

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 undertak

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

And 6 credits of honours research from the following:

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

Complementary Courses (9 credits)

One of the following Statistics courses or equivalent:

Biometry

Location Note:

When planning your schedule and re

ECON 405	(3)	Natural Resource Economics
ENVB 437	(3)	Assessing Environmental Impact
ENVR 201	(3)	Society, Environment and Sustainability
ENVR 203	(3)	Knowledge, Ethics and Environment
ENVR 400	(3)	Environmental Thought
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 370	(3)	Protected Areas
GEOG 382	(3)	Principles Earth Citizenship
GEOG 403	(3)	Global Health and Environmental Change Geography of De

URBP 201	(3)	Planning the 21st Century City
URBP 506	(3)	Environmental Policy and Planning
URBP 530	(3)	Urban Infrastructure and Services in International Context
URBP 551	(3)	Urban Design and Planning
WILD 415*	(2)	Conservation Law

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](#).