ENVIRONMENT MAJOR - ECOLOGICAL DETERMINANTS OF HEALTH - CELLULAR (B.SC.(AG.ENV.SC.)) OR (B.SC.) (63 CREDITS)

Offered by: Bieler School of Environment
Degree: Bachelor of Science (Agricultural and Environmental Sciences)
Program credit weight: 63

Program Description

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

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

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

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

Note: For information about Fall 2025 and Winter 2026 course offerings, please check back on May 8, 2025. Until then, the "Terms offered" field will appear blank for most courses while the class schedule is being finalized.

Suggested First Year (U1) Courses

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

Program Requirements

Note: You are required to take a maximum of 33 credits at the 200 level and a minimum of 12 credits at the 400 level or higher in this program. This includes core and required courses.

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

Core: Required Courses (18 credits)

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

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Course	Title	Credits
ENVR 200	The Global Environment.	3
ENVR 201	Society, Environment and Sustainability.	3
ENVR 202	The Evolving Earth.	3
ENVR 203	Knowledge, Ethics and Environment.	3
ENVR 301	Environmental Research Design.	3
ENVR 400	Environmental Thought.	3

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

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

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Course	Title	Credits
AEBI 427	Barbados Interdisciplinary Project.	6
ENVR 401	Environmental Research.	3
ENVR 451	Research in Panama.	6
FSCI 444	Barbados Research Project.	6

Domain: Required Course (6 credits)

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Course	Title	Credits
GEOG 403	Global Health and Environmental Change.	3
PARA 410	Environment and Infection.	3

Domain: Complementary Courses (36 credits)

36 credits of the complementary courses are selected as follows:

18 credits - Fundamentals, 3 credits from each category

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

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

Fundamentals

18 credits of Fundamentals, 3 credits from each category.

Health, Society, and Environment

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Course	Title	Credits
GEOG 221	Environment and Health.[1]	3
GEOG 303	Health Geography.	3
GEOG 503	Advanced Topics in Health Geography.	3
NRSC 221	Environment and Health.[1]	3
PPHS 529	Global Environmental Health and Burden of Disease.	3
SOCI 234	Population and Society.	3
SOCI 309	Health and Illness.	3
SOCI 331	Population and Environment.	3

[1] Note: You may take GEOG 221 Environment and Health. or NRSC 221 Environment and Health., but not both.

Cellular Biology

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Course	Title	Credits
ANSC 234	Biochemistry 2.	3
BIOL 201	Cell Biology and Metabolism.[1]	3
LSCI 202	Molecular Cell Biology.[1]	3

[1] Note: You will not receive credit for either LSCI 211 Biochemistry 1. or LSCI 202 Molecular Cell Biology. if you have already received credit for both BIOL 200 Molecular Biology. and BIOL 201 Cell Biology and Metabolism.; you will not receive credit for either BIOL 200 Molecular Biology. or BIOL 201 Cell Biology and Metabolism. if you have already received credit for both LSCI 202 Molecular Cell Biology. and LSCI 211 Biochemistry 1..

Genetics

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Course	Title	Credits
BIOL 202	Basic Genetics.	3
LSCI 204	Genetics.	3

Molecular Biology

Expand allContract all

Course	Title	Credits
BIOL 200	Molecular Biology.[1]	3
LSCI 211	Biochemistry 1.[1]	3

[1] Note: You will not receive credit for either LSCI 211 Biochemistry 1. or LSCI 202 Molecular Cell Biology. if you have already received credit for both BIOL 200 Molecular Biology. and BIOL 201 Cell Biology and Metabolism.; you will not receive credit for either BIOL 200 Molecular Biology. or BIOL 201 Cell Biology and Metabolism. if you have already received credit for both LSCI 202 Molecular Cell Biology. and LSCI 211 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.

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Course	Title	Credits
AEMA 310	Statistical Methods 1.	3
MATH 203	Principles of Statistics 1.	3

Nutrition

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Course	Title	Credits
ANSC 433	Animal Nutrition and Metabolism.	3
NUTR 207	Nutrition and Health.	3
NUTR 307	Metabolism and Human Nutrition.	3

Human Health

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

Immunology and Pathogenicity

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Course	Title	Credits
MICR 341	Mechanisms of Pathogenicity.	3
MIMM 214	Introductory Immunology: Elements of Immunity.	3
MIMM 314	Intermediate Immunology.	3
PARA 438	Immunology.	3
PATH 300	Human Disease.	3

Infectious Disease

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Course	Title	Credits
ANSC 400	Eukaryotic Cells and Viruses.	3
MIMM 324	Fundamental Virology.	3
MIMM 413	Parasitology.[1]	3
PARA 424	Fundamental Parasitology.[1]	3
PPHS 501	Population Health and Epidemiology.	3

[1] Note: You can take MIMM 413 Parasitology. or PARA 424 Fundamental Parasitology., but not both.

Toxicology

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Course	Title	Credits
ANSC 312	Animal Health and Disease.	3
ENVB 500	Advanced Topics in Ecotoxicology.	3

NUTR 512	Herbs, Foods and Phytochemicals.	3
PHAR 300	Drug Action.	3
PHAR 303	Principles of Toxicology.	3

Hormones

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Course	Title	Credits
ANSC 424	Metabolic Endocrinology.[1]	3
PHGY 210	Mammalian Physiology 2.[1]	3
PSYC 342	Hormones and Behaviour.	3

[1] Note: You will not receive credit for ANSC 424 Metabolic Endocrinology. if you have already received credit for both PHGY 209 Mammalian Physiology 1. and PHGY 210 Mammalian Physiology 2.; you will not receive credit for PHGY 210 Mammalian Physiology 2. if you have already received credit for both ANSC 323 Mammalian Physiology. and ANSC 424 Metabolic Endocrinology..

Physiology

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Course	Title	Credits
ANSC 323	Mammalian Physiology.[1]	3
PHGY 209	Mammalian Physiology 1.[1]	3

[1] Note: You will not receive credit ANSC 323 Mammalian Physiology. if you have already received credit for both PHGY 209 Mammalian Physiology 1. and PHGY 210 Mammalian Physiology 2.; you will not receive credit for PHGY 209 Mammalian Physiology 1. if you have already received credit for both ANSC 323 Mammalian Physiology. and ANSC 424 Metabolic Endocrinology..

Natural Environment

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

Hydrology and Climate

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Course	Title	Credits
ATOC 341	Caribbean Climate and Weather.	3
BREE 217	Hydrology and Water Resources.[1]	3
GEOG 321	Climatic Environments.	3
GEOG 322	Environmental Hydrology.[1]	3

[1] Note: You may take BREE 217 Hydrology and Water Resources. or GEOG 322 Environmental Hydrology., but not both.

Techniques and Management

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

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

Pest Management

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Course	Title	Credits
BIOL 350	Insect Biology and Control.	3
ENTO 352	Biocontrol of Pest Insects.	3

Pollution Control and Management

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Course	Title	Credits
BREE 322	Organic Waste Management.	3
BREE 518	Ecological Engineering.	3
NRSC 333	Pollution and Bioremediation.	3
PARA 515	Water, Health and Sanitation.	3

Ecology

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Course	Title	Credits
AEBI 421	Tropical Horticultural Ecology.	3
BIOL 343	Biodiversity in the Caribean.	3
BIOL 432	Limnology.	3
BIOL 451	Research in Ecology and Development in Africa.[1]	3
BIOL 465	Conservation Biology.	3
BIOL 540	Ecology of Species Invasions.[1]	3
BIOL 553	Neotropical Environments.	3
ENVB 410	Ecosystem Ecology.	3
ENVR 540	Ecology of Species Invasions.[1]	3
MICR 331	Microbial Ecology.	3
NRSC 451	Research in Ecology and Development in Africa.[1]	3
PLNT 304	Biology of Fungi.	3
PLNT 460	Plant Ecology.	3

[1] Note: You may take ENVR 540 Ecology of Species Invasions. or BIOL 540 Ecology of Species Invasions., but not both; you many take BIOL 451 Research in Ecology and Development in Africa. or NRSC 451 Research in Ecology and Development in Africa., but not both.