

X—Degree Programs, Bachelor of Science in Environmental Sciences [B.Sc.(Env.)]

Program Information

Objectives of the Program

The Environmental Sciences program is designed to provide a strong interdisciplinary grounding in specific environmental sciences including the socioeconomic context in which environmental issues are resolved.

There is an emphasis on management and decision-making skills for the application of scientific knowledge to environmental problems, and the evaluation of appropriate environmental policies. A practical problem solving perspective is central to the program, and this is often done in the context of group work.

Substantial emphasis is placed on communication skills, including the development of both good writing ability and oral communication ability. This is emphasized particularly in the Environmental Sciences core courses, starting in first year, and running through to fourth year. Students in the final years of their program will be expected to take part in more intensive communication skill development.

Graduates will seek employment in a range of fields, from government agencies to private industry and research.

Academic Counselling

General information on the degree program is available from the Program Counsellor, Faculty of Environmental Sciences. Advising for each major is available through the assigned faculty advisor responsible for the major. Students are encouraged to seek the advice of the faculty advisors when choosing restricted electives and planning course selections.

Degree

The degree granted for the successful completion of the program will be the Bachelor of Science in Environmental Sciences—B.Sc.(Env.).

Continuation of Study

Students are advised to consult the regulations for Continuation of Study in Section VIII—Undergraduate Degree Regulations and Procedures of this Calendar.

Conditions for Graduation

In order to qualify for graduation from the B.Sc.(Env.) program, the student must have completed successfully the stated course requirements for the program.

Environmental Sciences (Co-op)

Office of the Associate Dean, Faculty of Environmental Sciences.

A 4-year Honours Program in Environmental Sciences is offered as a Co-operative Education Program. This option is offered within the B.Sc. (Env.) degree and is available to all majors. The program requirements are the same as those listed for the regular B.Sc. (Env.) program, by the Co-operative Education Program and as outlined in the Continuation of Study policy (Section VIII—Undergraduate Degree Regulations & Procedures).

Two streams are available (A and B) with entry to Stream A directly from high school and entry to Stream B after completion of semester 2. In Stream A, 3 co-op work terms (COOP*1000, COOP*2000, COOP*3000) are required. In Stream B, an optional 4th co-op work term (COOP*4000) is available. COOP*1100 must be completed during the semester preceding COOP*1000 (ie. in semester 2 in Stream A and semester 4 in Stream B).

The recommended work/study semester sequence for Streams A and B are given below. **Work / Study Semesters:**

Year	Stream	Fall	Winter	Spring
1	A	Academic Term 1	Academic Term 2	Academic Term 3
2	A	COOP*1000	Academic Term 4	COOP*2000
	B	Academic Term 3	Academic Term 4	COOP*1000
3	A	Academic Term 5	COOP*3000	Academic Term 6
	B	COOP*2000	Academic Term 5	Off
4	A	Academic Term 7	Academic Term 8	COOP*4000
	B	Academic Term 6	COOP*3000	Optional
5	B	Academic Term 7	Academic Term 8	

Since some of the program requirements in the degree program (core, major, area of emphasis) are not offered each semester, careful planning and program consultation with the Environmental Co-op Advisor is essential.

The Environmental Sciences Program

The degree in Environmental Sciences consists of 20.00 credits, as follows:

- 5.00 First Year Curriculum

- 3.00 Environmental Sciences Core
- 7.00–8.00 Environmental Sciences Major
- 2.50 minimum Area of Emphasis
- free electives

Within these courses, students must include at least 6.00 credits at the 3000 or 4000 level, and no program may include more than 7.00 credits at the 1000 level.

First Year Curriculum

The first year courses have been selected to provide students with sufficient background and knowledge to enter any one of the Environmental Sciences majors.

Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1110	[0.50]	Introductory Physics with Applications I

Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Introductory Physics with Applications II

Environmental Sciences Core

In addition to the common first year curriculum, students are required to take the following core Environmental Sciences courses in the semesters recommended below:

BIOL*2060	[0.50]	Ecology
ENVS*2010	[0.50]	Decision-making and Communication Skills
ENVS*4011/2	[0.50]	Colloquium/Project in Environmental Sciences
PHIL*2070	[0.50]	Philosophy of the Environment

Note: BIOL*2060 is to be taken in Semester 3 or 4, ENVS*2010 is to be taken in Semester 4, ENVS*4011/2 is to be taken in Semester 7 or 8, and PHIL*2070 is to be taken in Semester 4 or 6.

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

Note: AGECE*2700 is to be taken in Semester 4 and ECON*2100 is to be taken in Semester 3.

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
ZOO*4050	[0.50]	Natural Resources Policy

Note: GEOG*3210 and POLS*3370 are to be taken in Semester 5 or 6 and ZOO*4050 is to be taken in Semester 7 or 8.

Environmental Sciences Majors

- Earth and Atmospheric Science
- Ecology
- Environmental Economics and Policy
- Environmental Geography
- Environmental Monitoring and Analysis
- Environmental Protection
- Environmetrics
- Natural Resources Management

Requirements for each of these majors are described in the detailed schedules of studies below.

Area of Emphasis Requirements

All students must choose an area of emphasis consisting of a minimum of 2.50 credits in a particular topic area. These are listed after "Schedules of Studies". The sequence of courses normally begins in third year. With the approval of the Program Counsellor, students may develop their own area of emphasis. All areas of emphasis must be approved by the Program Counsellor. Students should note that entry to certain areas of emphasis is restricted by the student's choice of major. Thus program approval should be gained before registering in courses to count towards their area of emphasis.

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Earth and Atmospheric Science (EAAS/EAAS:C)

Department of Land Resource Science, Ontario Agricultural College.

Major

Semester 3

GEOL*1050 [0.50] Geology and the Environment
 MET*2030 [0.50] Meteorology and Climatology
 STAT*2040 [0.50] Statistics I

1.00 core requirement or electives

Semester 4

SOIL*2010 [0.50] Soil Science

2.00 core requirement or electives

Semester 5

GEOL*2110 [0.50] Earth Material Science

1.50 core requirement, restricted electives or electives

One of:

MATH*1210 [0.50] Calculus II
 MATH*2080 [0.50] Elements of Calculus II
 STAT*2050 [0.50] Statistics II

Semester 6

SOIL*3600 [0.50] Remote Sensing

1.50 core requirement, restricted electives or electives

One of:

GEOL*3060 [0.50] Groundwater
 SOIL*3070 [0.50] Environmental Soil Physics

Semester 7

SOIL*4210 [0.50] Earth and Atmospheric Science Field Camp

2.00 core requirement, restricted electives or electives

Semester 8

2.50 core requirement, restricted electives or electives

Restricted Electives

Students in the Earth and Atmospheric Science major are required to choose 2.50 credits from the following lists. Students are encouraged to consult with the faculty advisor for assistance.

List A – Environmental Geology

GEOL*2020 [0.50] Stratigraphy
 GEOL*2150 [0.75] Glacial Geology
 GEOL*3100 [0.50] Non-Renewable Earth Resources
 GEOL*3130 [0.50] Agrogeology
 GEOL*4090 [0.50] Sedimentology
 GEOL*4130 [0.50] Clay and Humic Chemistry

List B – Soil Science

PBIO*4100 [0.50] Soil Plant Relationships
 SOIL*3060 [0.50] Environmental Soil Chemistry
 SOIL*3070 [0.50] Environmental Soil Physics
 SOIL*3080 [0.50] Soil and Water Conservation
 SOIL*3200 [0.50] Environmental Soil Biology
 SOIL*4090 [0.50] Soil Management
 SOIL*4170 [0.50] Soil Processes in the Landscape

List C – Water

ENGG*2550 [0.50] Water Management
 ENGG*3650 [0.50] Hydrology
 GEOG*3610 [0.50] Environmental Hydrology
 GEOG*4150 [0.50] Sedimentary Processes
 GEOL*3190 [0.50] Environmental Water Chemistry
 SOIL*3080 [0.50] Soil and Water Conservation

List D – Atmosphere

GEOG*2110 [0.50] Climate and the Biophysical Environment
 MET*3050 [0.50] Microclimatology
 MET*4210 [0.50] Atmospheric Monitoring and Physical Meteorology
 MET*4300 [0.50] Atmospheric Transport and Chemistry

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Ecology (ECOL/ECOL:C)

College of Biological Science.

Major

Semester 3

BIOL*2210 [0.50] Introductory Cell Biology

CHEM*2300 [0.50] Chemical Reactivity

MBG*2000 [0.50] Introductory Genetics

STAT*2040 [0.50] Statistics I

One of:

CIS*1200 [0.50] Introduction to Computing

CIS*1500 [0.50] Introduction to Programming

Semester 4

BIOL*3110 [0.50] Population Ecology

CHEM*2580 [0.50] Introductory Biochemistry

STAT*2050 [0.50] Statistics II

1.00 core requirements or electives

Semester 5

BIOL*3120 [0.50] Community Ecology

1.00 core requirements or electives

One of:

BOT*3410 [0.50] Plant Anatomy

ZOO*2070 [0.50] Invertebrate Zoology I

ZOO*2090 [0.50] Vertebrate Structure and Function

One of:

BOT*2100 [0.50] Life Strategies of Plants

ZOO*3200 [0.50] Comparative Animal Physiology I

Semester 6

BIOL*3010 [0.50] Laboratory and Field Work in Ecology

1.50 core requirements or electives

One of:

MBG*3000 [0.50] Population Genetics

ZOO*3200 [0.50] Comparative Animal Physiology I

Semester 7

BIOL*4110 [0.75] Ecological Methods

1.75 core requirements or electives

Semester 8

BIOL*4120 [0.50] Evolutionary Ecology

2.00 core requirements or electives

Note: Ecology majors are not required to complete BIOL*2060 as a core course.

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Environmental Economics and Policy (EEP/EEP:C)

Department of Economics, College of Social and Applied Human Sciences.
Department of Agricultural Economics and Business, Ontario Agricultural College.

Major

Semester 3

ECON*1100 [0.50] Introductory Macroeconomics
ECON*2100 [0.50] Economic Growth and Environmental Quality
1.50 core requirements, restricted electives or electives

Semester 4

AGEC*2700 [0.50] Survey of Natural Resource Economics
ECON*2310 [0.50] Intermediate Microeconomics
ECON*2740 [0.50] Economic Statistics
1.00 core requirements, restricted electives or electives
Note: ECON*2740 may be substituted by STAT*2040.

Semester 5

AGEC*4290 [0.50] Land Economics
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*2770 [0.50] Introductory Mathematical Economics
1.00 core requirements, restricted electives or electives
Note: AGECE*4290 is taught in even-numbered years.

Semester 6

ECON*3740 [0.50] Introduction to Econometrics
2.00 core requirements, restricted electives or electives

Semester 7

ECON*3710 [0.50] Advanced Microeconomics
ECON*4930 [0.50] Environmental Economics
1.50 core requirements, restricted electives or electives
Note: Students must obtain permission from the instructor to take ECON*3710 and ECON*4930 at the same time.

Semester 8

AGEC*4310 [0.50] Resource Economics
2.00 core requirements, restricted electives or electives

Restricted Electives

Students in the Environmental Economics and Policy major are required to choose 2.00 credits additional Agricultural Economics and Business (AGEC*XXXX) or Economics (ECON*XXXX). Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000–4000 level.

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Environmental Geography (ENVG/ENVG:C)

Department of Geography, College of Social and Applied Human Sciences.

Major

Semester 3

GEOG*2000 [0.50] Geomorphology
 GEOG*2460 [0.50] Analysis in Geography
 1.50 core requirements or electives

Semester 4

GEOG*2110 [0.50] Climate and the Biophysical Environment
 GEOG*2210 [0.50] Environment and Resources
 GEOG*2480 [0.50] Cartographic Methods
 1.00 core requirements or electives

Note: GEOG*2420 or SOIL*3600 may be substituted for GEOG*2480.

Semester 5

GEOG*3110 [0.50] Biotic and Natural Resources
 GEOG*3210 [0.50] Management of the Biophysical Environment
 1.50 core requirements, restricted electives* or electives

Semester 6

GEOG*3480 [0.50] Geographic Information Systems
 2.00 core requirements, restricted electives* or electives

Semester 7

GEOG*4690 [1.00] Geography Field Research
 1.50 core requirements, restricted electives* or electives
 OR

0.50 credits in Geography at the 3000–4000 level
 2.00 core requirements, restricted electives* or electives

Semester 8

GEOG*4880 [0.50] Senior Seminar in Geography
 2.00 core requirements, restricted electives* or electives

* students in the Environmental Geography major must take at least 4 additional geography courses at the 3000–4000 level including:

At least 1 of:

GEOG*3000 [0.50] Fluvial Processes
 GEOG*3610 [0.50] Environmental Hydrology
 GEOG*3620 [0.50] Desert Environments

At least 2 of:

GEOG*3020 [0.50] Global Environmental Change
 GEOG*4110 [0.50] Environmental Systems Analysis
 GEOG*4210 [0.50] Environmental Resource Analysis

Note: Environmental Geography majors are required to complete GEOG*3210 and (POLS*3370 or ZOO*4050).

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Environmental Monitoring and Analysis (EMA/EMA:C)

College of Physical and Engineering Science.

Major

Semester 3

CHEM*2300	[0.50]	Chemical Reactivity
MATH*2080	[0.50]	Elements of Calculus II
MET*2030	[0.50]	Meteorology and Climatology
STAT*2040	[0.50]	Statistics I

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

Note: CIS*1650 may be substituted for CIS*1200 / CIS*1500 by students who have an OAC credit in Computing Science and are intending to take further courses in Computing and Information Science.

Semester 4

CHEM*2480	[0.50]	Analytical Chemistry I
CHEM*2580	[0.50]	Introductory Biochemistry
PHYS*2040	[0.50]	Fundamental Electronics and Sensors

1.00 core requirement or electives

Semester 5

PHYS*2550	[0.50]	Radiation and the Environment
STAT*2050	[0.50]	Statistics II
TOX*2000	[0.50]	Principles of Toxicology

1.00 core requirement or electives

Note: PHYS*2550 is offered in even numbered years.

Semester 6

PHYS*3080	[0.50]	Energy
STAT*3510	[0.50]	Environmental Risk Assessment

1.00 core requirement or electives

One of:

MET*4210	[0.50]	Atmospheric Monitoring and Physical Meteorology
MET*4300	[0.50]	Atmospheric Transport and Chemistry

Semester 7

ENVS*3360	[0.50]	Waste Management and Utilization
TOX*3300	[0.50]	Analytical Toxicology

1.50 core requirement or electives

Semester 8

CHEM*4010	[0.50]	Chemistry and Industry
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2.00 core requirement or electives

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Environmental Protection (ENVP/ENVP:C)

Department of Environmental Biology, Ontario Agricultural College.

Major

Semester 3

CHEM*2300 [0.50] Chemical Reactivity
 ENVB*2030 [0.50] Current Issues in Forest Science
 STAT*2040 [0.50] Statistics I

1.00 core requirement or electives

Semester 4

CHEM*2580 [0.50] Introductory Biochemistry
 ENVB*2010 [0.50] Food Production and the Environment

1.00 core requirement or electives

One of:

BOT*2100 [0.50] Life Strategies of Plants
 ZOO*3200 [0.50] Comparative Animal Physiology I

Semester 5

BIOL*3450 [0.50] Introduction to Aquatic Environments
 CHEM*3560 [0.50] Structure and Function in Biochemistry
 MET*2030 [0.50] Meteorology and Climatology
 TOX*2000 [0.50] Principles of Toxicology

0.50 core requirement or electives

Semester 6

ENVB*3030 [0.50] Pesticides and the Environment
 MBG*2000 [0.50] Introductory Genetics

1.50 core requirement or electives

Semester 7

ENVB*3300 [0.50] Applied Ecology and Environment
 MICR*4140 [0.50] Soil Microbiology and Biotechnology
 MICR*4180 [0.50] Microbial Processes in Environmental Management
 ZOO*4350 [0.50] Biology of Polluted Waters

0.50 core requirement or electives

Semester 8

ENVB*4240 [0.50] Biological Activity of Pesticides

2.00 core requirement or electives

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Environmetrics (ENVM/ENVM:C)

Department of Mathematics and Statistics, College of Physical and Engineering Science.

Department of Computing and Information Science, College of Physical and Engineering Science.

Major

Semester 3

CIS*1650 [0.50] Programming I
 MATH*2080 [0.50] Elements of Calculus II

0.50 core requirement, restricted elective or elective

One of:

MATH*2150 [0.50] Applied Matrix Algebra
 MATH*2160 [0.50] Linear Algebra I

Note: MATH*2160 is preferred for mathematics emphasis.

One of:

STAT*2040 [0.50] Statistics I
 STAT*2100 [0.50] Introductory Probability and Statistics

Students electing List C – Computing must consult the Environmetrics Faculty Advisor for course scheduling in semesters 4 through 8.

Semester 4

MATH*2130 [0.50] Numerical Methods
 MATH*2170 [0.50] Differential Equations I
 STAT*2050 [0.50] Statistics II

1.00 core requirements, restricted electives or electives

Semester 5

2.50 core requirements, restricted electives or electives

Semester 6

MATH*3510 [0.50] Biomathematics
 STAT*3510 [0.50] Environmental Risk Assessment

1.50 core requirements, restricted electives or electives

Semester 7

2.50 core requirements, restricted electives or electives

Semester 8

2.50 core requirements, restricted electives or electives

Restricted Electives

Students in the Environmetrics major are required to choose 3.50 credits of restricted electives from 1 of the following lists:

List A – Mathematics

MATH*2200 [0.50] Advanced Calculus I
 MATH*2210 [0.50] Advanced Calculus II
 MATH*3100 [0.50] Differential Equations II
 MATH*3170 [0.50] Partial Differential Equations and Special Functions
 MATH*3240 [0.50] Operations Research
 MATH*4430 [0.50] Advanced Numerical Methods

One of:

MATH*4070 [0.50] Case Studies in Modeling
 MATH*4510 [0.50] Environmental Transport and Dynamics

List B – Statistics

STAT*3100 [0.50] Introductory Mathematical Statistics I
 STAT*3110 [0.50] Introductory Mathematical Statistics II
 STAT*3240 [0.50] Applied Regression Analysis
 STAT*3320 [0.50] Sampling Theory with Applications
 STAT*4350 [0.50] Applied Multivariate Statistical Methods
 STAT*4510 [0.50] Advanced Risk Analysis

One of:

STAT*4340 [0.50] Statistical Inference
 STAT*4360 [0.50] Applied Time Series Analysis

List C – Computing

Students electing List C – Computing must consult the Environmetrics Faculty Advisor for course scheduling in semesters 4 through 8.

CIS*1900 [0.50] Discrete Structures in Computer Science
 CIS*2420 [0.50] Data Structures
 CIS*2450 [0.50] Software Systems Development and Integration
 CIS*2650 [0.50] Programming II
 CIS*3460 [0.50] System Simulation
 CIS*3490 [0.50] The Analysis and Design of Computer Algorithms
 CIS*3650 [0.50] Compilers

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Natural Resources Management (NRM/NRM:C)

Department of Land Resource Science, Ontario Agricultural College.

Major

Semester 3

MET*2030 [0.50] Meteorology and Climatology
 SOIL*2120 [0.50] Introduction to Environmental Stewardship
 STAT*2040 [0.50] Statistics I

1.00 core requirements, restricted electives or electives

Note: GEOG*2460 may be substituted for STAT*2040.

Semester 4

SOIL*2010 [0.50] Soil Science
 2.00 core requirements, restricted electives or electives

Semester 5

ENVB*2030 [0.50] Current Issues in Forest Science
 SOIL*3050 [0.50] Land Utilization
 SOIL*3080 [0.50] Soil and Water Conservation

1.00 core requirements, restricted electives or electives

Semester 6

ENGG*2550 [0.50] Water Management
 SOIL*3100 [0.50] Resource Planning Techniques

1.50 core requirements, restricted electives or electives

Semester 7

SOIL*4110 [0.50] Natural Resources Management Field Camp
 ZOO*4110 [0.50] Principles of Fish and Wild Life Management

1.50 core requirements, restricted electives or electives

Note: BIOL*4150 may be substituted for ZOO*4110.

Semester 8

2.50 core requirements, restricted electives or electives

Restricted Electives

Students in the Natural Resources Management major are required to choose 1.50 restricted elective credits from the following list:

CROP*2280 [0.50] Crops in Land Reclamation
 ENVB*3000 [0.50] Nature Interpretation
 ENVB*4780 [0.50] Forest Ecology
 ENVS*3320 [0.50] Principles of Landscape Ecology
 ENVS*4220 [0.50] Environmental Impact Assessment
 GEOG*2420 [0.50] Aerial-photo Interpretation
 GEOG*3210 [0.50] Management of the Biophysical Environment
 GEOG*3480 [0.50] Geographic Information Systems
 GEOL*3130 [0.50] Agrogeology
 LARC*4520 [0.50] Park and Recreation Administration
 MET*3050 [0.50] Microclimatology
 SOIL*3060 [0.50] Environmental Soil Chemistry
 SOIL*3070 [0.50] Environmental Soil Physics
 SOIL*3200 [0.50] Environmental Soil Biology
 SOIL*4170 [0.50] Soil Processes in the Landscape

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Areas of Emphasis

All students must choose an area of emphasis consisting of a minimum of 2.50 credits in a particular topic area. The sequence of courses normally begins in third year. With the approval of the program counsellor, students may develop their own area of emphasis. All areas of emphasis must be approved by the program counsellor. Students should note that entry to certain areas of emphasis is restricted by the student's choice of major. Thus program approval should be gained before registering in courses to count towards their area of emphasis.

Atmospheric Resources (AR)

MET*2030 [0.50] Meteorology and Climatology

Four of:

GEOG*2110 [0.50] Climate and the Biophysical Environment
 MET*2020 [0.50] Agrometeorology
 MET*3050 [0.50] Microclimatology
 MET*4210 [0.50] Atmospheric Monitoring and Physical Meteorology
 MET*4300 [0.50] Atmospheric Transport and Chemistry

Biotic Systems (BS)

BIOL*3110 [0.50] Population Ecology
 BIOL*3120 [0.50] Community Ecology

Three of:

BIOL*3010 [0.50] Laboratory and Field Work in Ecology
 BIOL*3130 [0.50] Conservation Biology
 BIOL*3450 [0.50] Introduction to Aquatic Environments
 BOT*2050 [0.50] Plant Ecology
 ENVB*4780 [0.50] Forest Ecology
 MBG*2000 [0.50] Introductory Genetics
 MICR*4140 [0.50] Soil Microbiology and Biotechnology
 ZOO*4350 [0.50] Biology of Polluted Waters

Crop Ecology (CE)

ENVB*2010 [0.50] Food Production and the Environment

Four of:

CROP*2110 [0.50] Crop Ecology
 CROP*2280 [0.50] Crops in Land Reclamation
 CROP*4220 [0.50] Cropping Systems
 CROP*4240 [0.50] Weed Science
 CROP*4340 [0.50] Seminar: Selected Topics in Crop Science
 ENVB*2040 [0.50] Biology of Plant Pests
 ENVB*3030 [0.50] Pesticides and the Environment
 GEOG*3320 [0.50] Agricultural Systems and Dynamics
 SOIL*2010 [0.50] Soil Science

Development and Stewardship (DS)

SOIL*2120 [0.50] Introduction to Environmental Stewardship
 and 4 courses from List A or List B:

List A

AGEC*4210 [0.50] World Agriculture and Economic Development
 IDEV*2010 [0.50] Introduction to International Development
 REXT*4020 [0.50] Rural Extension in Change and Development

List B

GEOG*4390 [0.50] Rural Systems in Transition
 LARC*2820 [0.50] Urban and Regional Planning
 SOIL*3050 [0.50] Land Utilization

Environmental Administration (EA)

GEOG*3210 [0.50] Management of the Biophysical Environment
 HAFA*4390 [0.50] Individuals and Groups in Organizations

Three of:

COST*2020 [0.50] Information Management
 HAFA*3000 [0.50] Human Resources Management
 LARC*2820 [0.50] Urban and Regional Planning
 POLS*2250 [0.50] Public Administration
 POLS*3250 [0.50] Public Policy: Challenges and Prospects
 REXT*3040 [0.50] Communication Process

Environmental Degradation (ED)

Three of:

ENGG*2550 [0.50] Water Management
 ENVS*3360 [0.50] Waste Management and Utilization
 MICR*4180 [0.50] Microbial Processes in Environmental Management
 SOIL*3200 [0.50] Environmental Soil Biology
 TOX*2000 [0.50] Principles of Toxicology
 ZOO*4350 [0.50] Biology of Polluted Waters

Two of:

BIOL*3010 [0.50] Laboratory and Field Work in Ecology
 CROP*2280 [0.50] Crops in Land Reclamation
 GEOG*3110 [0.50] Biotic and Natural Resources
 SOIL*3050 [0.50] Land Utilization
 SOIL*3080 [0.50] Soil and Water Conservation

Environmental Economics and Policy (EEP)

ECON*1100 [0.50] Introductory Macroeconomics

One of:

AGEC*2700 [0.50] Survey of Natural Resource Economics

ECON*2100 [0.50] Economic Growth and Environmental Quality
 Note: Whichever course of AGECE*2100 or AGECE*2700 is not taken for the Environmental Sciences core is required for this area of emphasis.

Three of:

AGEC*4290 [0.50] Land Economics
 AGECE*4310 [0.50] Resource Economics
 ECON*2310 [0.50] Intermediate Microeconomics
 ECON*2650 [0.50] Introductory Development Economics
 ECON*3580 [0.50] Economics of Regulation
 ECON*4930 [0.50] Environmental Economics

Note: Additional prerequisites are needed for ECON*4930.

Environmental Impact Assessment (EIA)

ENVS*4220 [0.50] Environmental Impact Assessment
 STAT*3510 [0.50] Environmental Risk Assessment

One of:

ENGG*3340 [0.50] Geographic Information Systems in Environmental Engineering

GEOG*3480 [0.50] Geographic Information Systems

Two of:

BIOL*3450 [0.50] Introduction to Aquatic Environments
 GEOG*4110 [0.50] Environmental Systems Analysis
 GEOL*3190 [0.50] Environmental Water Chemistry
 PBIO*4530 [0.50] Environmental Pollution Stresses on Plants
 PHYS*3080 [0.50] Energy
 TOX*2000 [0.50] Principles of Toxicology
 ZOO*4350 [0.50] Biology of Polluted Waters

Note: Additional prerequisites are needed for STAT*3510.

Environmental Management in the U.S. (EMUS)

This Area of Emphasis is undertaken at Bowling Green State University, Ohio. Students are strongly encouraged to undertake an internship (for University of Guelph credit) at a location/agency in the U.S. to be approved jointly by Bowling Green State University (Center for Environmental Programs) and the University of Guelph (Associate Dean's Office, Faculty of Environmental Sciences). The internship is undertaken upon the completion of the courses at Bowling Green State University.

At least 2 of the following BGSU courses:

ENVS301 – Environmental Problems (3 cr.)
 ENVS401 – Environmental Strategies (2 cr.)
 ENVS402 – Environmental Impact Statements (3 cr.)

At least 2 of the following BGSU courses:

POLS302 – American Domestic Public Policy (3 cr.)
 POLS303 – Introduction to Public Administration (3 cr.)
 POLS331 – State and Local Government (3 cr.)
 POLS336 – Environmental Policy and Politics (3 cr.)

Students must complete at least 15 BGSU credits. Upon completion of the U.S. internship, students will receive credit for ENVS*3100.

Land Resources (LR)

GEOG*2000 [0.50] Geomorphology
 GEOL*1050 [0.50] Geology and the Environment
 SOIL*2010 [0.50] Soil Science

Two of:

GEOL*2150 [0.75] Glacial Geology
 GEOL*3130 [0.50] Agrogeology
 MET*2030 [0.50] Meteorology and Climatology
 SOIL*3080 [0.50] Soil and Water Conservation
 SOIL*4170 [0.50] Soil Processes in the Landscape

Landscape Ecology (LE)

ENVS*3320 [0.50] Principles of Landscape Ecology

Four of:

BIOL*3010 [0.50] Laboratory and Field Work in Ecology
 BIOL*4150 [0.50] Wildlife Conservation and Management
 ENVB*2030 [0.50] Current Issues in Forest Science
 ENVB*4780 [0.50] Forest Ecology
 GEOG*2000 [0.50] Geomorphology
 GEOG*2110 [0.50] Climate and the Biophysical Environment
 GEOG*4110 [0.50] Environmental Systems Analysis
 LARC*2100 [0.50] Landscape Analysis
 SOIL*2010 [0.50] Soil Science
 SOIL*3080 [0.50] Soil and Water Conservation
 ZOO*4110 [0.50] Principles of Fish and Wild Life Management

Mathematical Modelling and Risk Assessment (MMRA)

MATH*2150 [0.50] Applied Matrix Algebra
 MATH*2170 [0.50] Differential Equations I
 MATH*3510 [0.50] Biomathematics
 STAT*2050 [0.50] Statistics II
 STAT*3510 [0.50] Environmental Risk Assessment

One of:

MATH*2080 [0.50] Elements of Calculus II
 STAT*2040 [0.50] Statistics I

If any of the above are included in the student's major, then one of the following must be taken:

CIS*2650 [0.50] Programming II
 MATH*2130 [0.50] Numerical Methods

STAT*3240 [0.50] Applied Regression Analysis

Water Resources (WR)

GEOL*3060 [0.50] Groundwater

One of:

ENGG*3650 [0.50] Hydrology

GEOG*3610 [0.50] Environmental Hydrology

Three of:

BIOL*3450 [0.50] Introduction to Aquatic Environments

ENGG*2550 [0.50] Water Management

GEOG*3000 [0.50] Fluvial Processes

GEOL*3190 [0.50] Environmental Water Chemistry

SOIL*3070 [0.50] Environmental Soil Physics