ENVIRONMENTAL SCIENCES CO-OP (ENVS:C)

School of Environmental Sciences, Ontario Agricultural College

This major combines a foundation in the breadth of environmental science while giving students practical experience in integrating the basic science in environmental problem solving. The integration of biophysical sciences with real-world applications provides students with a unique skill set for engaging with current and future environmental issues. The many opportunities in the major for experiential learning and independent research give students an ability to collect, analyze and interpret environmental data, and propose solutions that account for both the biophysical science and the socio-economic context. The second year core curriculum develops a cross-disciplinary understanding of the biophysical environment, while the third and fourth years allow students to engage more deeply with issues of interest to them. Students will graduate from this major ready to address diverse problems such as pollinator conservation, soil and water conservation, greenhouse gas mitigation, plant disease management and chemical movement in the environment. It provides a solid background for careers in environmental protection, resource management and research, in both the public and private sectors.

Program Requirements

The Co-op program in Environmental Sciences is a four and a half year program including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Environmental Sciences Academic and Co-op Work Term Schedule

Year	Fall	Winter	Summer
1	Academic Semester 1	Academic Semester 2; COOP*1100	Off
2	Academic Semester 3	COOP*1000 Work Term I	Academic Semester 4
3	COOP*2000 Work Term II	Academic Semester 5	COOP*3000 Work Term III
4	Academic Semester 6	Academic Semester 7	COOP*4000 Work Term IV
5	Academic Semester 8	N/A	N/A

To be eligible to continue in the Co-op program, students must meet a minimum 70% cumulative average requirement after second semester, as well as meet all work term requirements. Please refer to the Co-operative Education program policy with respect to work term performance grading, work term report grading and program completion requirements.

For additional program information students should consult with their Co-op Co-ordinator and Co-op Faculty Advisor, listed on the Co-operative Education web site.

Credit Summary

(21.50 Total Credits)[1]

Code	Title	Credits
Environmental Sciences Core		7.00
Required Courses for the Major		4.50
Restricted Electives		5.50
Free Electives		3.00
Co-op Work Terms		1.50
Total Credits		**21.5**

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COOP*4000 Co-op Work Term IV is optional and if completed the total number of credits will equal 22.00.

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement.

Students are encouraged to seek advice from their faculty advisor and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000-4000 level. With prior approval, students may be able to use courses not on Lists C, D, E or F toward their restricted electives.

The recommended program sequence is outlined below.

Major

Code	Title	Credits
Semester 1 - Fall		
BIOL*1070	Discovering Biodiversity	0.50
CHEM*1040	General Chemistry I	0.50
ENVS*1030	Introduction to Environmental Sciences	1.00
MATH*1080	Elements of Calculus I	0.50
Semester 2 - Winter		
BIOL*1090	Introduction to Molecular and Cellular Biology	0.50
CHEM*1050	General Chemistry II	0.50
COOP*1100	Introduction to Co-operative Education	0.00
FARE*1040	Introduction to Environmental Economics, Law and Policy	1.00
GEOG*1300	Introduction to the Biophysical Environment	0.50
Semester 3 - Fall		
ENVS*2030	Meteorology and Climatology	0.50
ENVS*2060	Soil Science	0.50
ENVS*2240	Fundamentals of Environmental Geology	0.50
1.00 electives or restricted electives		1.00
Winter Semester		
COOP*1000	Co-op Work Term I	0.50
Semester 4 - Summer		
STAT*2040	Statistics I	0.50
2.00 electives or restricted electives		2.00
Fall Semester		
COOP*2000	Co-op Work Term II	0.50
Semester 5 - Winter		
BIOL*2060	Ecology	0.50
ENVS*2080	Introduction to Environmental Microbiology	0.50

ENVS*2310	Introduction to Biogeochemistry	0.50
1.00 electives or restricted electives		1.00
Summer Semester		
COOP*3000	Co-op Work Term III	0.50
Semester 6 - Fall [2]		
ENVS*4001	Project in Environmental Sciences	0.50
1.50 electives or restricted electives		1.50
Select 0.50 credits from the following:		
ECON*2100	Economic Growth and Environmental Quality	0.50
FARE*2700	Survey of Natural Resource Economics	0.50
GEOG*2210	Environment and Resources [3]	0.50
Semester 7 - Winter		
ENVS*3150	Aquatic Systems [2]	0.50
ENVS*4002	Project in Environmental Sciences	0.50
1.50 electives or restricted electives		1.50
Summer Semester - (Optional)		
COOP*4000	Co-op Work Term IV	0.50
Semester 8 - Fall		
2.50 electives or restricted electives		2.50

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Students wishing to register in BIOL*4350 Limnology of Natural and Polluted Waters must substitute BIOL*3450 Introduction to Aquatic Environments in Semester 6 for ENVS*3150 Aquatic Systems in Semester 7.

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Students can take GEOG*2210 Environment and Resources in semester 5 or 7.

Restricted Electives

Students must take a total of 6.50 restricted elective credits as prescribed by the following lists.

Students must take 0.50 credits from each of List A & B

List A

Code	Title	Credits
ENVS*2330	Current Issues in Ecosystem Science and Biodiversity	0.50
or ENVS*2040	Plant Health and the Environment	

List B

Code	Title	Credits
Select 0.50 credits from the following: [4]		
PHYS*1070	Physics for Life Sciences II	0.50
PHYS*1080	Physics for Life Sciences	0.50
PHYS*1300	Fundamentals of Physics	0.50

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Students lacking 4U Physics or equivalent must take PHYS*1300 Fundamentals of Physics.

Students are required to choose a minimum of 5.50 credits from Lists C, D, E, and F. Students must take a minimum of 1.50 credits from List C, a minimum of 1.00 credits from List D, and students may not count more than 1.00 credits from List F towards their restricted electives. Students should note that many restricted electives, particularly in List D, require other courses as prerequisites. Students should consult the most recent Undergraduate Calendar for specific requirements.

List C

Students must take a minimum of 1.50 credits from the following list:

Code	Title	Credits
BIOL*3130	Conservation Biology	0.50
CHEM*3360	Environmental Chemistry and Toxicology	0.50
ENVS*2120	Introduction to Environmental Stewardship	0.50
ENVS*2210	Apiculture and Honey Bee Biology	0.50
ENVS*2230	Communications in Environmental Science	0.50
ENVS*3000	Nature Interpretation	0.50
ENVS*3010	Climate Change Biology	0.50
ENVS*3020	Pesticides and the Environment	0.50
ENVS*3040	Natural Chemicals in the Environment	0.50
ENVS*3050	Microclimatology	0.50
ENVS*3060	Groundwater	0.50
ENVS*3080	Soil and Water Conservation	0.50
ENVS*3090	Insect Diversity and Biology	0.50
ENVS*3180	Sedimentary Environments	0.50
ENVS*3210	Plant Pathology	0.50
ENVS*3220	Terrestrial Chemistry	0.50
ENVS*3240	Creative Writing for Environmental Science	0.50
ENVS*3230	Agroforestry Systems	0.50
ENVS*3250	Forest Health and Disease	0.50
ENVS*3270	Forest Biodiversity	0.50
ENVS*3290	Waterborne Disease Ecology	0.50
ENVS*3300	Introduction to Controlled Environment Systems	0.50
ENVS*3310	Soil Biodiversity and Ecosystem Function	0.50
ENVS*3340	Environmental Data Analysis	0.50
ENVS*3370	Terrestrial Ecosystem Ecology	0.50
MICR*3220	Plant Microbiology	0.50
TOX*2000	Principles of Toxicology	0.50

List D

Students must take a minimum of 1.00 credits from the following list:

Code	Title	Credits
BIOL*4350	Limnology of Natural and Polluted Waters	0.50
ENVS*4000	Toxicological Risk Assessment	0.50
ENVS*4030	Ecohydrology	0.50
ENVS*4050	Predicting Impacts of Environmental Change	0.50
ENVS*4070	Pollinator Conservation	0.50
ENVS*4090	Soil Management	0.50
ENVS*4100	Integrated Management of Invasive Insect Pests	0.50
ENVS*4160	Soil and Nutrient Management	0.50
ENVS*4180	Insecticide Biological Activity and Resistance	0.50
ENVS*4190	Biological Activity of Herbicides	0.50
ENVS*4210	Meteorological and Environmental Instrumentation	0.50

ENVS*4230	Biology of Aquatic Insects	0.50
ENVS*4260	Field Entomology	0.50
ENVS*4320	Laboratory and Field Methods in Soil Biodiversity	1.00
ENVS*4350	Forest Ecology	0.50
ENVS*4360	Glacial Environments	0.50
ENVS*4370	Natural and Anthropogenic Compounds in the Environment	0.50
ENVS*4390	Soil Variability and Land Evaluation	1.00
ENVS*4440	Advanced Controlled Environment Systems	0.50
PBIO*4290	Cannabis Production	0.50
PBIO*4530	Plants and Environmental Pollution	0.50

List E

Code	Title	Credits
ENVS*3330	Environmental Flexible Internship	0.50
ENVS*4410	Introduction to Advanced Independent Research	0.50
ENVS*4420	Advanced Independent Research	0.50
ENVS*4430	Advanced Independent Research	1.00
ENVS*4510	Topics in Environmental Sciences	0.50

List F

Students may count up to 1.00 credits from the following list towards their 6.50 credit restricted electives.

Code	Title	Credits
GEOG*2420	The Earth From Space	0.50
GEOG*2480	Mapping and GIS	0.50
GEOG*3420	Remote Sensing of the Environment	0.50
GEOG*3480	GIS and Spatial Analysis	0.50