ENVIRONMENTAL MANAGEMENT MAJOR CO-OP (EM:C)

School of Environmental Sciences and Department of Food, Agricultural and Resource Economics, Ontario Agricultural College

The major in Environmental Management focuses on the development of leaders in the areas of environmental science and technology. The program combines a solid background in environmental science and management with business, using a mix of theoretical and applied study. The flexibility provided in semesters 6 through 8 permits students to develop their understanding of specific areas of environmental science and business or take a variety of areas within the discipline. This flexibility also allows students to participate in international exchanges. Students have the opportunity to incorporate a variety of field trips, experiential learning in the workplace and independent research projects into their program.

A principal aim of the Co-op program in Environmental Management is to facilitate the transition of students from academic studies to a professional career by enhancing the integration of theory and practice. Students taking the degree may also take a minor in another subject area. A maximum of 2.50 credits required for the BBRM.EM co-op program may be applied to meet the requirements of a minor. Students should note that completion of a minor may require additional credits beyond the 20.00 required for the program. Students intending to acquire a minor should consult with their Program Counsellor.

Program Requirements

The Co-op program in Environmental Management is a five-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 Management Academic and Co-op Work Term Schedule

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Academic Semester 1</td>
<td>Academic Semester 2</td>
<td>Off</td>
</tr>
<tr>
<td>2</td>
<td>Academic Semester 3, COOP*1100</td>
<td>Academic Semester 4</td>
<td>COOP*1000 Work Term I</td>
</tr>
<tr>
<td>3</td>
<td>Academic Semester 5</td>
<td>Academic Semester 6</td>
<td>COOP*2000 Work Term II</td>
</tr>
<tr>
<td>4</td>
<td>COOP*3000 Work Term III</td>
<td>COOP*4000 Work Term IV</td>
<td>Off</td>
</tr>
<tr>
<td>5</td>
<td>Academic Semester 7</td>
<td>Academic Semester 8</td>
<td>N/A</td>
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</tbody>
</table>

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 website.

Credit Summary (22.00 Total Credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Required Courses</td>
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<tr>
<td>Restricted Electives</td>
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<tr>
<td>Free Electives</td>
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<td>2.00</td>
</tr>
<tr>
<td>Co-op Work Terms</td>
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<tr>
<td>Total Credits</td>
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<td>22</td>
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</table>

Of these credits, a minimum of 6.00 credits are required at the 3000 level or higher, of which at least 2.00 credits must be at the 4000 level.

Major

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Semester 1 - Fall</td>
<td></td>
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</tr>
<tr>
<td>BIOL*1070</td>
<td>Discovering Biodiversity</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>General Chemistry I</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*1030</td>
<td>Introduction to Environmental Sciences</td>
<td>1.00</td>
</tr>
<tr>
<td>MGMT*2150</td>
<td>Introduction to Canadian Business Management</td>
<td>0.50</td>
</tr>
<tr>
<td>Semester 2 - Winter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCT*1220</td>
<td>Introductory Financial Accounting</td>
<td>0.50</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>Introduction to Molecular and Cellular Biology</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*1040</td>
<td>Introduction to Environmental Economics, Law and Policy</td>
<td>1.00</td>
</tr>
<tr>
<td>HROB*2090</td>
<td>Individuals and Groups in Organizations</td>
<td>0.50</td>
</tr>
<tr>
<td>Summer Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP*1000</td>
<td>Co-op Work Term I</td>
<td>0.50</td>
</tr>
<tr>
<td>Semester 3 - Fall</td>
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<td></td>
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<tr>
<td>BIOL*2060</td>
<td>Ecology</td>
<td>0.50</td>
</tr>
<tr>
<td>COOP*1100</td>
<td>Introduction to Co-operative Education</td>
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</tr>
<tr>
<td>ENVS*2060</td>
<td>Soil Science</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*2230</td>
<td>Communications in Environmental Science</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*2700</td>
<td>Survey of Natural Resource Economics</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*2480</td>
<td>Mapping and GIS</td>
<td>0.50</td>
</tr>
<tr>
<td>Semester 4 - Winter</td>
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<td></td>
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<tr>
<td>ENVS*2040</td>
<td>Plant Health and the Environment</td>
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</tr>
<tr>
<td>ENVS*2080</td>
<td>Introduction to Environmental Microbiology</td>
<td>0.50</td>
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<td>1.50</td>
</tr>
<tr>
<td>Summer Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP*1000</td>
<td>Co-op Work Term I</td>
<td>0.50</td>
</tr>
<tr>
<td>Semester 5 - Fall</td>
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<td></td>
</tr>
<tr>
<td>GEOG*2420</td>
<td>The Earth From Space</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*2460</td>
<td>Analysis in Geography</td>
<td>0.50</td>
</tr>
<tr>
<td>or STAT*2060</td>
<td>Statistics for Business Decisions</td>
<td>0.50</td>
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<tr>
<td>1.50 electives or restricted electives</td>
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<td>1.50</td>
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</table>
### Semester 6 - Winter

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS*3020</td>
<td>Pesticides and the Environment</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3060</td>
<td>Groundwater</td>
<td>0.50</td>
</tr>
<tr>
<td>1.50 electives or restricted electives</td>
<td></td>
<td>1.50</td>
</tr>
</tbody>
</table>

### Summer Semester

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*2000</td>
<td>Co-op Work Term II</td>
<td>0.50</td>
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### Fall Semester

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*3000</td>
<td>Co-op Work Term III</td>
<td>0.50</td>
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</table>

### Winter Semester

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*4000</td>
<td>Co-op Work Term IV</td>
<td>0.50</td>
</tr>
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</table>

### Semester 7 - Fall

2.50 electives or restricted electives | 2.50

### Semester 8 - Winter

2.50 electives or restricted electives | 2.50

### Restricted Electives

Students should note that some restricted electives require other courses not included among the required courses for the major as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements.

Students should consult with a faculty advisor before Semester 4 in planning their restricted elective choices. Students are advised to pay particular attention to prerequisite requirements when choosing individual courses and seek advice as needed.

1. Students must select a minimum of 6.50 credits from the following lists of restricted electives.

#### List A

Students must select a minimum of 3.50 credits from any of the following courses without regard to group of which at least 1.00 credits must be at the 4000 level:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*3450</td>
<td>Introduction to Aquatic Environments</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*3360</td>
<td>Environmental Chemistry and Toxicology</td>
<td>0.50</td>
</tr>
<tr>
<td>EDRD*3450</td>
<td>Watershed Planning Practice</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3220</td>
<td>Terrestrial Chemistry</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4030</td>
<td>Ecodynamics</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4370</td>
<td>Natural and Anthropogenic Compounds in the Environment</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*3610</td>
<td>Environmental Hydrology</td>
<td>0.50</td>
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</table>

#### List B

Students must select a minimum of 1.50 credits from list B. At least 0.50 credits must be at the 4000 level:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS*2330</td>
<td>Current Issues in Ecosystem Science and Biodiversity</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3000</td>
<td>Nature Interpretation</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3010</td>
<td>Climate Change Biology</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3090</td>
<td>Insect Diversity and Biology</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3230</td>
<td>Agroforestry Systems</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3250</td>
<td>Forest Health and Disease</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3270</td>
<td>Forest Biodiversity</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4070</td>
<td>Pollinator Conservation</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4230</td>
<td>Biology of Aquatic Insects</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4260</td>
<td>Field Entomology</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4350</td>
<td>Forest Ecology</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*3320</td>
<td>Food Systems: Issues in Security and Sustainability</td>
<td>0.50</td>
</tr>
<tr>
<td>BIOL*4500</td>
<td>Natural Resource Policy Analysis</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*2120</td>
<td>Introduction to Environmental Stewardship</td>
<td>0.50</td>
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<tr>
<td>ENVS*2240</td>
<td>Fundamentals of Environmental Geology</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4000</td>
<td>Toxicological Risk Assessment</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4230</td>
<td>Integrated Management of Invasive Insect Pests</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4180</td>
<td>Insecticide Biological Activity and Resistance</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4190</td>
<td>Biological Activity of Herbicides</td>
<td>0.50</td>
</tr>
<tr>
<td>PBIO*4530</td>
<td>Plants and Environmental Pollution</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3040</td>
<td>Natural Chemicals in the Environment</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3310</td>
<td>Soil Biodiversity and Ecosystem Function</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3090</td>
<td>Soil Management</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4160</td>
<td>Soil and Nutrient Management</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4320</td>
<td>Laboratory and Field Methods in Soil Biodiversity</td>
<td>1.00</td>
</tr>
<tr>
<td>ENVS*4390</td>
<td>Soil Variability and Land Evaluation</td>
<td>1.00</td>
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</tbody>
</table>

### Ecosystem and Resource Management

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOG*3420</td>
<td>Remote Sensing of the Environment</td>
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</tr>
<tr>
<td>GEOG*4110</td>
<td>Environmental Systems Analysis</td>
<td>1.00</td>
</tr>
<tr>
<td>GEOG*4220</td>
<td>Local Environmental Management</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*4230</td>
<td>Environmental Impact Assessment</td>
<td>0.50</td>
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</table>

### Plant Health

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENVS*3040</td>
<td>Natural Chemicals in the Environment</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3210</td>
<td>Plant Pathology</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4100</td>
<td>Integrated Management of Invasive Insect Pests</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4180</td>
<td>Insecticide Biological Activity and Resistance</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4190</td>
<td>Biological Activity of Herbicides</td>
<td>0.50</td>
</tr>
<tr>
<td>PBIO*4530</td>
<td>Plants and Environmental Pollution</td>
<td>0.50</td>
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### Soil and Nutrient Management

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS*3080</td>
<td>Soil and Water Conservation</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*3310</td>
<td>Soil Biodiversity and Ecosystem Function</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4090</td>
<td>Soil Management</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4160</td>
<td>Soil and Nutrient Management</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4320</td>
<td>Laboratory and Field Methods in Soil Biodiversity</td>
<td>1.00</td>
</tr>
<tr>
<td>ENVS*4390</td>
<td>Soil Variability and Land Evaluation</td>
<td>1.00</td>
</tr>
</tbody>
</table>

### List B

Students must select a minimum of 1.50 credits from list B. At least 0.50 credits must be at the 4000 level:
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT*1240</td>
<td>Applied Financial Accounting</td>
<td>0.50</td>
</tr>
<tr>
<td>ACCT*2230</td>
<td>Management Accounting</td>
<td>0.50</td>
</tr>
<tr>
<td>ACCT*3230</td>
<td>Intermediate Management Accounting</td>
<td>0.50</td>
</tr>
<tr>
<td>ACCT*4230</td>
<td>Advanced Management Accounting</td>
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</table>

**Business and Management**

<table>
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<tr>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT*3020</td>
<td>Corporate Social Responsibility</td>
<td>0.50</td>
</tr>
<tr>
<td>MGMT*3320</td>
<td>Financial Management</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Food, Agriculture and Resource Economics**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FARE*2410</td>
<td>Agri-food Markets and Policy</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*3170</td>
<td>Cost-Benefit Analysis</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*3310</td>
<td>Operations Management</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*4290</td>
<td>Land Economics</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*4310</td>
<td>Resource Economics</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*4360</td>
<td>Marketing Research</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*4370</td>
<td>Food &amp; Agri Marketing Management</td>
<td>0.50</td>
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</tbody>
</table>

**Leadership and Communications**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>EDRD*2020</td>
<td>Interpersonal Communication</td>
<td>0.50</td>
</tr>
<tr>
<td>EDRD*3140</td>
<td>Organizational Communication</td>
<td>0.50</td>
</tr>
<tr>
<td>EDRD*3400</td>
<td>Sustainable Communities</td>
<td>0.50</td>
</tr>
<tr>
<td>EDRD*4120</td>
<td>Leadership Development in Small Organizations</td>
<td>0.50</td>
</tr>
<tr>
<td>HROB*2010</td>
<td>Foundations of Leadership</td>
<td>0.50</td>
</tr>
<tr>
<td>HROB*4010</td>
<td>Leadership Certificate Capstone</td>
<td>0.50</td>
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</table>

**List C**

Students may also select any of the following courses as restricted electives:

<table>
<thead>
<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>AGR*3450</td>
<td>Research Methods in Agricultural Science</td>
<td>0.50</td>
</tr>
<tr>
<td>AGR*4450</td>
<td>Research Project I</td>
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<tr>
<td>AGR*4460</td>
<td>Research Project II</td>
<td>1.00</td>
</tr>
<tr>
<td>AGR*4600</td>
<td>Agriculture and Food Issues Problem Solving</td>
<td>1.00</td>
</tr>
<tr>
<td>BIOC*2580</td>
<td>Introduction to Biochemistry</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*1050</td>
<td>General Chemistry II</td>
<td>0.50</td>
</tr>
<tr>
<td>ECON*1100</td>
<td>Introductory Macroeconomics</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4410</td>
<td>Introduction to Advanced Independent Research</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4420</td>
<td>Advanced Independent Research</td>
<td>0.50</td>
</tr>
<tr>
<td>ENVS*4430</td>
<td>Advanced Independent Research</td>
<td>1.00</td>
</tr>
<tr>
<td>FARE*4550</td>
<td>Independent Studies I</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*4560</td>
<td>Independent Studies II</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*1300</td>
<td>Introduction to the Biophysical Environment</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*1350</td>
<td>Earth: Hazards and Global Change</td>
<td>0.50</td>
</tr>
</tbody>
</table>

1 Students considering graduate studies are encouraged to take at least 1.00 of these credits.