

# Environmental Science

Co-operative Education option is available in the Environmental Science program.

## Graduation Requirements

In addition to the requirements listed below, students must satisfy:

1. the University regulations (see the *Academic Regulations of the University* section of this Calendar),
2. the common regulations applying to all B.Sc. programs including those relating to Science Continuation and Breadth requirements (see *Academic Regulations for the Bachelor of Science Degree*).

Students should consult with the Institute when planning their program and selecting courses.

## Course Categories

The Environmental Science program description makes use of the following course categories:

### Approved Arts or Social Sciences

(approved by the Environmental Science Institute)

### Approved Environmental Science Specialization

(Approved by the Environmental Science Institute)

### Free Electives

(see Academic Regulations for the Bachelor of Science Degree)

### Approved Science for Environmental Science

Courses approved by the Institute of Environmental Science include the following that comply with the Academic Regulations for the Bachelor of Science degree.

- Biochemistry
- Biology
- Chemistry
- Computer Science
- Earth Science
- Environmental Science
- Geography
- Geomatics
- Mathematics and Statistics
- Physics

### Prohibited and Restricted Courses

Technology, Society, Environment Studies (TSES) courses are not accepted as Science Continuation courses in these programs, but may be used as Approved Environmental Science Specialization courses or as free electives.

## Program Requirements

### Environmental Science

#### B.Sc. Honours (20.0 credits)

##### A. Credits Included in the Major CGPA (11.0 credits)

<b>1. 5.0 credits from:</b>		<b>5.0</b>
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Camp	
ENSC 2001 [0.5]	Earth Resources and Natural Hazards: Environmental Impacts	
ENSC 2002 [0.5]	Methods and Analysis in Environmental Science	
ENSC 3000 [0.5]	Environmental Science and Management: Theory and Practice	
ENSC 3001 [0.5]	Professional Practice in Environmental Science	
ENSC 3509 [0.5]	Group Research Project	
ENSC 3906 [0.5]	Research Techniques and Project Planning	
ENSC 4906 [1.0]	Honours Research Project	
<b>2. 1.0 credit in:</b>		<b>1.0</b>
BIOL 2600 [0.5]	Introduction to Ecology	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
<b>3. 0.5 credit from:</b>		<b>0.5</b>
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3108 [0.5]	Soil Properties	
<b>4. 0.5 credit from:</b>		<b>0.5</b>
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3205 [0.5]	Physical Hydrogeology	
<b>5. 1.0 credit in Approved Science for Environmental Science at the 4000-level excluding:</b>		<b>1.0</b>
ENSC 4001 [0.5]	Environmental Science Practicum	
<b>6. 1.5 credits in Approved Science for Environmental Science</b>		<b>1.5</b>
<b>7. 1.5 credits in Approved Environmental Science Specialization</b>		<b>1.5</b>
<b>B. Credits Not Included in the Major CGPA (9.0 credits)</b>		
<b>8. 1.0 credits in:</b>		<b>1.0</b>
MATH 1007 [0.5]	Elementary Calculus I	
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
<b>9. 3.0 credits in:</b>		<b>3.0</b>
BIOL 1103 [0.5]	Foundations of Biology I	
BIOL 1104 [0.5]	Foundations of Biology II	
CHEM 1001 [0.5]	General Chemistry I	
CHEM 1002 [0.5]	General Chemistry II	
ERTH 1006 [0.5]	Exploring Planet Earth	
GEOG 2013 [0.5]	Weather and Water	
<b>10. 0.5 credit in:</b>		<b>0.5</b>
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
<b>11. 0.5 credit in:</b>		<b>0.5</b>
CHEM 2302 [0.5]	Analytical Chemistry	
<b>12. 0.5 credit from:</b>		<b>0.5</b>
BIOL 2107 [0.5]	Fundamentals of Genetics	

or BIOL 2201 [0.5]	Cell Biology and Biochemistry	
<b>13. 0.5 credit from:</b>		0.5
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3108 [0.5]	Soil Properties	
<b>14. 0.5 credit from:</b>		0.5
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3205 [0.5]	Physical Hydrogeology	
<b>15. 1.5 credits in</b>	Approved Arts and Social Sciences	1.5
<b>16. 1.0 credit in</b>	free electives.	1.0
<b>Total Credits</b>		<b>20.0</b>

## Environmental Science with Concentration in Biology B.Sc. Honours (20.0 credits)

### A. Credits Included in the Major CGPA (11.5 credits)

<b>1. 5.0 credits from:</b>		5.0
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Camp	
ENSC 2001 [0.5]	Earth Resources and Natural Hazards: Environmental Impacts	
ENSC 2002 [0.5]	Methods and Analysis in Environmental Science	
ENSC 3000 [0.5]	Environmental Science and Management: Theory and Practice	
ENSC 3001 [0.5]	Professional Practice in Environmental Science	
ENSC 3509 [0.5]	Group Research Project	
ENSC 3906 [0.5]	Research Techniques and Project Planning	
ENSC 4906 [1.0]	Honours Research Project	
<b>2. 1.0 credit in:</b>		1.0
BIOL 2600 [0.5]	Introduction to Ecology	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
<b>3. 0.5 credit from:</b>		0.5
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3108 [0.5]	Soil Properties	
<b>4. 0.5 credit from:</b>		0.5
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3205 [0.5]	Physical Hydrogeology	
<b>5. 0.5 credit in</b>	Approved Science for Environmental Science at the 4000-level, excluding:	0.5
ENSC 4001 [0.5]	Environmental Science Practicum	
<b>6. 4.0 credits in:</b>		4.0
a. 1.5 credit in:		
BIOL 2001 [0.5]	Animals: Form and Function	
BIOL 2002 [0.5]	Plants: Form and Function	
BIOL 2200 [0.5]	Cellular Biochemistry	
b. 0.5 credit from:		
BIOL 2303 [0.5]	Microbiology	

BIOL 3004 [0.5]	Insect Diversity	
BIOL 3102 [0.5]	Mycology	
BIOL 3205 [0.5]	Plant Biochemistry and Physiology	
c. 2.0 credits in a focus:		
Ecology focus:		
i) 0.5 credit in:		
BIOL 3604 [0.5]	Analysis of Ecological Relationships	
ii) 1.0 credit from:		
BIOL 3601 [0.5]	Ecosystems and Environmental Change	
BIOL 3602 [0.5]	Conservation Biology	
BIOL 3605 [0.5]	Field Course I	
BIOL 3606 [0.5]	Field Course II	
iii) 0.5 credit BIOL at the 4000-level		
or		
Microbiology/genetics focus:		
i) 1.0 credit from:		
BIOL 3104 [0.5]	Molecular Genetics	
BIOL 4103 [0.5]	Population Genetics	
ii) 0.5 credit from:		
BIOL 2303 [0.5]	Microbiology	
BIOL 3102 [0.5]	Mycology	
BIOL 3303 [0.5]	Experimental Microbiology	
iii) 0.5 credit BIOL at the 4000-level		
<b>B. Credits Not Included in the Major CGPA (8.5 credits)</b>		
<b>8. 1.0 credit in:</b>		1.0
MATH 1007 [0.5]	Elementary Calculus I	
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
<b>9. 3.0 credits in:</b>		3.0
BIOL 1103 [0.5]	Foundations of Biology I	
BIOL 1104 [0.5]	Foundations of Biology II	
CHEM 1001 [0.5]	General Chemistry I	
CHEM 1002 [0.5]	General Chemistry II	
GEOG 2013 [0.5]	Weather and Water	
ERTH 1006 [0.5]	Exploring Planet Earth	
<b>10. 0.5 credit in:</b>		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
<b>11. 0.5 credit in:</b>		0.5
CHEM 2302 [0.5]	Analytical Chemistry	
<b>12. 0.5 credit in:</b>		0.5
BIOL 2104 [0.5]	Introductory Genetics	
<b>13. 0.5 credit from:</b>		0.5
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3108 [0.5]	Soil Properties	
<b>14. 0.5 credit from:</b>		0.5
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3205 [0.5]	Physical Hydrogeology	
<b>15. 1.5 credits in</b>	Approved Arts and Social Sciences	1.5
<b>16. 0.5 credit in</b>	free electives.	0.5
<b>Total Credits</b>		<b>20.0</b>

## Environmental Science with Concentration in Chemistry

### B.Sc. Honours (20.0 credits)

#### A. Credits Included in the Major CGPA (12.0 credits)

##### 1. 5.0 credits from: 5.0

ENSC 1500 [0.5]	Environmental Science Seminar
ENSC 2000 [0.5]	Environmental Science Field Camp
ENSC 2001 [0.5]	Earth Resources and Natural Hazards: Environmental Impacts

ENSC 2002 [0.5]	Methods and Analysis in Environmental Science
-----------------	---

ENSC 3000 [0.5]	Environmental Science and Management: Theory and Practice
-----------------	---

ENSC 3001 [0.5]	Professional Practice in Environmental Science
-----------------	--

ENSC 3509 [0.5]	Group Research Project
-----------------	------------------------

ENSC 3906 [0.5]	Research Techniques and Project Planning
-----------------	--

ENSC 4906 [1.0]	Honours Research Project
-----------------	--------------------------

##### 2. 1.0 credit in: 1.0

BIOL 2600 [0.5]	Introduction to Ecology
-----------------	-------------------------

CHEM 2800 [0.5]	Foundations for Environmental Chemistry
-----------------	---

##### 3. 0.5 credit from: 0.5

GEOG 3103 [0.5]	Watershed Hydrology
-----------------	---------------------

GEOG 3104 [0.5]	Principles of Biogeography
-----------------	----------------------------

GEOG 3105 [0.5]	Climate and Atmospheric Change
-----------------	--------------------------------

GEOG 3108 [0.5]	Soil Properties
-----------------	-----------------

##### 4. 0.5 credit from: 0.5

ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective
-----------------	---

ERTH 2403 [0.5]	Introduction to Oceanography
-----------------	------------------------------

ERTH 3205 [0.5]	Physical Hydrogeology
-----------------	-----------------------

##### 5. 3.0 credits in: 3.0

CHEM 2203 [0.5]	Organic Chemistry I
-----------------	---------------------

CHEM 2204 [0.5]	Organic Chemistry II
-----------------	----------------------

CHEM 2303 [0.5]	Analytical Chemistry
-----------------	----------------------

CHEM 2501 [0.5]	Introduction to Inorganic and Bioinorganic Chemistry
-----------------	--

CHEM 3305 [0.5]	Advanced Analytical Chemistry Laboratory
-----------------	--

CHEM 3800 [0.5]	The Chemistry of Environmental Pollutants
-----------------	---

##### 6. 1.5 credits in: 1.5

Organic focus:

CHEM 3201 [0.5]	Advanced Organic Chemistry I
-----------------	------------------------------

CHEM 3202 [0.5]	Advanced Organic Chemistry II
-----------------	-------------------------------

CHEM 3205 [0.5]	Experimental Organic Chemistry
-----------------	--------------------------------

or

Inorganic focus:

i) 1.0 credit in:

CHEM 3503 [0.5]	Inorganic Chemistry I
-----------------	-----------------------

CHEM 3504 [0.5]	Inorganic Chemistry II
-----------------	------------------------

ii) 0.5 credit in CHEM at the 4000-level

##### 7. 0.5 credit in: 0.5

CHEM 4800 [0.5]	Atmospheric Chemistry
-----------------	-----------------------

#### B. Credits not included in the Major CGPA (8.0 credits)

##### 8. 1.5 credit in: 1.5

MATH 1007 [0.5]	Elementary Calculus I
-----------------	-----------------------

MATH 1107 [0.5]	Linear Algebra I
-----------------	------------------

STAT 2507 [0.5]	Introduction to Statistical Modeling I
-----------------	--

##### 9. 3.0 credits in: 3.0

BIOL 1103 [0.5]	Foundations of Biology I
-----------------	--------------------------

BIOL 1104 [0.5]	Foundations of Biology II
-----------------	---------------------------

CHEM 1001 [0.5]	General Chemistry I
-----------------	---------------------

CHEM 1002 [0.5]	General Chemistry II
-----------------	----------------------

ERTH 1006 [0.5]	Exploring Planet Earth
-----------------	------------------------

GEOG 2013 [0.5]	Weather and Water
-----------------	-------------------

##### 10. 0.5 credit in: 0.5

PHIL 2380 [0.5]	Introduction to Environmental Ethics
-----------------	--------------------------------------

##### 11. 0.5 credit in: 0.5

CHEM 2302 [0.5]	Analytical Chemistry
-----------------	----------------------

##### 12. 0.5 credit from: 0.5

BIOL 2107 [0.5]	Fundamentals of Genetics
-----------------	--------------------------

or BIOL 2201 [0.5]	Cell Biology and Biochemistry
--------------------	-------------------------------

##### 13. 0.5 credit from: 0.5

GEOG 3103 [0.5]	Watershed Hydrology
-----------------	---------------------

GEOG 3104 [0.5]	Principles of Biogeography
-----------------	----------------------------

GEOG 3105 [0.5]	Climate and Atmospheric Change
-----------------	--------------------------------

GEOG 3108 [0.5]	Soil Properties
-----------------	-----------------

##### 14. 1.5 credits in Approved Arts and Social Sciences 1.5

Total Credits 20.0

## Environmental Science with Concentration in Earth Sciences

### B.Sc. Honours (20.0 credits)

#### A. Credits Included in the Major CGPA (11.5 credits)

##### 1. 5.0 credits from: 5.0

ENSC 1500 [0.5]	Environmental Science Seminar
-----------------	-------------------------------

ENSC 2000 [0.5]	Environmental Science Field Camp
-----------------	----------------------------------

ENSC 2001 [0.5]	Earth Resources and Natural Hazards: Environmental Impacts
-----------------	--

ENSC 2002 [0.5]	Methods and Analysis in Environmental Science
-----------------	---

ENSC 3000 [0.5]	Environmental Science and Management: Theory and Practice
-----------------	---

ENSC 3001 [0.5]	Professional Practice in Environmental Science
-----------------	--

ENSC 3509 [0.5]	Group Research Project
-----------------	------------------------

ENSC 3906 [0.5]	Research Techniques and Project Planning
-----------------	--

ENSC 4906 [1.0]	Honours Research Project
-----------------	--------------------------

##### 2. 1.0 credit in: 1.0

BIOL 2600 [0.5]	Introduction to Ecology
-----------------	-------------------------

CHEM 2800 [0.5]	Foundations for Environmental Chemistry
-----------------	---

##### 3. 0.5 credit from: 0.5

GEOG 3103 [0.5]	Watershed Hydrology
-----------------	---------------------

GEOG 3104 [0.5]	Principles of Biogeography
-----------------	----------------------------

GEOG 3105 [0.5]	Climate and Atmospheric Change
-----------------	--------------------------------

GEOG 3108 [0.5]	Soil Properties
-----------------	-----------------

##### 4. 3.0 credits in: 3.0

ERTH 2102 [0.5]	Mineralogy to Petrology
-----------------	-------------------------

ERTH 2104 [0.5]	Igneous Systems, Geochemistry and Processes
-----------------	---

ERTH 2105 [0.5]	Geodynamics	
ERTH 2314 [0.5]	Sedimentation and Stratigraphy	
ERTH 2406 [0.5]	Geology and Map Interpretation	
ERTH 3205 [0.5]	Physical Hydrogeology	
<b>5. 1.0 credit from:</b>		1.0
ERTH 2312 [0.5]	Paleontology	
ERTH 3003 [0.5]	Geochemistry and Geochronology	
ERTH 3204 [0.5]	Mineral Deposits	
ERTH 3206 [0.5]	Oceanography: Its Modern and Geologic Records	
ERTH 3207 [0.5]	Metamorphic Petrology and Processes	
ERTH 3405 [0.5]	Geophysical Methods	
ERTH 3806 [0.5]	Structural Geology	
<b>6. 1.0 credit in EARTH at the 4000-level</b>		1.0
<b>B. Credits not included in the Major CGPA (8.5 credits)</b>		
<b>7. 1.0 credit in:</b>		1.0
MATH 1007 [0.5]	Elementary Calculus I	
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
<b>8. 3.0 credits in:</b>		3.0
BIOL 1103 [0.5]	Foundations of Biology I	
BIOL 1104 [0.5]	Foundations of Biology II	
CHEM 1001 [0.5]	General Chemistry I	
CHEM 1002 [0.5]	General Chemistry II	
ERTH 1006 [0.5]	Exploring Planet Earth	
GEOG 2013 [0.5]	Weather and Water	
<b>9. 0.5 credit in:</b>		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
<b>10. 0.5 credit in:</b>		0.5
CHEM 2302 [0.5]	Analytical Chemistry	
<b>11. 0.5 credit in:</b>		0.5
PHYS 1007 [0.5]	Elementary University Physics I	
<b>12. 0.5 credit from:</b>		0.5
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3108 [0.5]	Soil Properties	
<b>13. 0.5 credit from:</b>		0.5
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 2802 [0.5]	Field Geology	
<b>14. 1.5 credits in Approved Arts or Social Sciences</b>		1.5
<b>15. 0.5 credit in:</b>		0.5
GEOM 2007 [0.5]	Geographic Information Systems	
<b>Total Credits</b>		<b>20.0</b>

## Environmental Science B.Sc. Major (20.0 credits)

### A. Credits Included in the Major CGPA (11.0 credits)

<b>1. 4.0 credits in:</b>		4.0
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Camp	
ENSC 2001 [0.5]	Earth Resources and Natural Hazards: Environmental Impacts	
ENSC 2002 [0.5]	Methods and Analysis in Environmental Science	

ENSC 3000 [0.5]	Environmental Science and Management: Theory and Practice	
ENSC 3001 [0.5]	Professional Practice in Environmental Science	
ENSC 3509 [0.5]	Group Research Project	
ENSC 4700 [0.5]	Topics in Environmental Science	
<b>2. 1.0 credit in:</b>		1.0
BIOL 2600 [0.5]	Introduction to Ecology	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
<b>3. 0.5 credit from:</b>		0.5
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3108 [0.5]	Soil Properties	
<b>4. 0.5 credit from:</b>		0.5
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3205 [0.5]	Physical Hydrogeology	
<b>5. 1.0 credit in Approved Science for Environmental Science at the 4000-level excluding:</b>		1.0
ENSC 4001 [0.5]	Environmental Science Practicum	
<b>6. 1.5 credits in Approved Science for Environmental Science</b>		1.5
<b>7. 1.5 credits in Approved Environmental Science Specialization</b>		1.5
<b>B. Credits Not Included in the Major CGPA (10.0 credits)</b>		
<b>8. 1.0 credit in:</b>		1.0
MATH 1007 [0.5]	Elementary Calculus I	
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
<b>9. 3.0 credits in:</b>		3.0
BIOL 1003 [0.5]	Introductory Biology I	
BIOL 1004 [0.5]	Introductory Biology II	
CHEM 1001 [0.5]	General Chemistry I	
CHEM 1002 [0.5]	General Chemistry II	
ERTH 1006 [0.5]	Exploring Planet Earth	
GEOG 2013 [0.5]	Weather and Water	
<b>10. 0.5 credit in:</b>		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
<b>11. 0.5 credit in:</b>		0.5
CHEM 2302 [0.5]	Analytical Chemistry	
<b>12. 0.5 credit from:</b>		0.5
BIOL 2107 [0.5]	Fundamentals of Genetics	
or BIOL 2201 [0.5]	Cell Biology and Biochemistry	
<b>13. 0.5 credit from:</b>		0.5
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3108 [0.5]	Soil Properties	
<b>14. 0.5 credit from:</b>		0.5
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3205 [0.5]	Physical Hydrogeology	

15. 1.5 credits in Approved Arts and Social Sciences	1.5
16. 2.0 credits in free electives.	2.0
Total Credits	20.0

## Environmental Science (ENSC) Courses

### Institute of Environ Science

#### Faculty of Science

#### ENSC 1500 [0.5 credit]

##### Environmental Science Seminar

The purpose and nature of the program; society's view on the natural and human-modified environment; major environmental issues and their scientific aspects; preparation and presentation of paper and seminars. Prerequisite(s): enrolment in the Environmental Science program.

Lectures, seminars and workshops four hours a week.

#### ENSC 2000 [0.5 credit]

##### Environmental Science Field Camp

A ten-day field course taken before classes begin in the fall, including exercises from geological, hydro geological, chemical, biological, and geographic aspects of environmental science. A supplementary field camp fee may apply.

Prerequisite(s): EARTH 1006 and BIOL 1004 or BIOL 1104, CHEM 1001 and CHEM 1002 and permission of the Institute.

#### ENSC 2001 [0.5 credit]

##### Earth Resources and Natural Hazards: Environmental Impacts

Environmental impact of mineral, energy and water resource exploitation and impact of hazardous Earth processes such as volcanic eruptions, earthquakes and others: their prediction and mitigation.

Lectures three hours per week.

#### ENSC 2002 [0.5 credit]

##### Methods and Analysis in Environmental Science

Study and application of qualitative and quantitative techniques in environmental science, including data collection and assembly, database manipulation, data analysis, and strategy development. Example case studies focus on multidisciplinary environmental problems involving techniques, such as, life cycle analysis, environmental impact analysis and carbon footprint analysis.

Prerequisite(s): completion of ENSC 2000 and permission of the institute.

Lectures and seminars three hours a week.

#### ENSC 3000 [0.5 credit]

##### Environmental Science and Management: Theory and Practice

Theoretical and practical perspectives related to environmental science and management; Emphasis on real-world problems associated with human activities and development of solutions in natural and built environments; Hands-on experience with environmental monitoring and restoration. A supplementary fee will apply. Prerequisite(s): third-year standing in Environmental Science or permission of the Institute. Field trips, lectures and workshops, 7 hours per week (delivered on a single day).

#### ENSC 3001 [0.5 credit]

##### Professional Practice in Environmental Science

Study of professional activities and the documentation of proposals, planning, accreditation and research; issues of health and safety, professional ethics and codes of certification; review of practicum, internship and co-op work terms, and the professional application of Environmental Science; Guest lectures and visits. Prerequisite(s): third-year standing in Environmental Science or permission of the Institute.

Lectures, seminars and workshops three hours a week.

#### ENSC 3509 [0.5 credit]

##### Group Research Project

Major project relating to an issue involving environmental science; effective methods of team research and presentation of group work.

Prerequisite(s): third-year standing in the Environmental Science program or permission of the Institute.

Lectures, seminars and workshops three hours a week.

#### ENSC 3700 [0.5 credit]

##### Topics in Environmental Science

Specific topics of current interest. Topics may vary from year to year.

Prerequisite(s): Third year standing in the Environmental Science program or permission of the Institute.

#### ENSC 3906 [0.5 credit]

##### Research Techniques and Project Planning

Assists students in preparing a research plan and proposal for their fourth year Honours project; discussion and workshop experience in the fundamentals of scientific investigation, including use of literature, theory and data, preparation and evaluation of a scientific research proposal.

Prerequisite(s): ENSC 3509 and good standing in third year Environmental Science with a minimum CGPA of 6.0 or permission of the Program Director.

Discussion groups and workshops three hours a week.



**ENSC 3999 [0.0 credit]****Co-operative Work Term**

Practical experience for students enrolled in the Co-operative Option. To receive course credit a student must receive satisfactory evaluations from their work term employer. Written reports describing the work term project will be required. Graded Sat or Uns.

Prerequisite(s): registration in the Environmental Science Co-operative Option and permission of the Institute. Four-month work term.

Four-month work term.

**ENSC 4001 [0.5 credit]****Environmental Science Practicum**

Experience in an external agency setting, translating the academic dimension into practical involvement with environmental issues. Requires a final report integrating the placement experience with the student's background knowledge. Graded Sat/Uns.

Prerequisite(s): fourth-year standing in the Environmental Science program.

**ENSC 4700 [0.5 credit]****Topics in Environmental Science**

Prerequisite: third-year standing in the Environmental Science program or permission of the Institute.

Lectures and discussion three hours a week.

**ENSC 4901 [0.5 credit]****Directed Projects**

Independent or group study, for fourth-year major students to explore a particular project, in consultation with a Faculty supervisor. May include directed reading, written assignments, tutorials, laboratory or field work.

Prerequisite(s): permission of the Institute. Students normally may not offer more than 1.0 credit of Directed Special Studies in their program.

**ENSC 4906 [1.0 credit]****Honours Research Project**

An independent investigation into an aspect of environmental science supervised by a member of the faculty. Approval of the topic and the research schedule must be obtained from the project supervisor and the course coordinator before the last date for late registration.

Prerequisite(s): fourth-year standing in the Honours Environmental Science program and permission of the Institute.

**Summer session:** some of the courses listed in this Calendar are offered during the summer. Hours and scheduling for summer session courses will differ significantly from those reported in the fall/winter Calendar. To determine the scheduling and hours for summer session classes, consult the class schedule at [central.carleton.ca](http://central.carleton.ca)

Not all courses listed are offered in a given year. For an up-to-date statement of course offerings for the current session and to determine the term of offering, consult the class schedule at [central.carleton.ca](http://central.carleton.ca)