Environmental Science

This section presents the requirements for programs in:

- **Environmental Science B.Sc. Honours**
- **Environmental Science with Concentration in Chemistry B.Sc. Honours**
- **Environmental Science with Concentration in Earth Sciences B.Sc. Honours**
- **Environmental Science with Concentration in Ecology, Biodiversity and Conservation B.Sc. Honours**
- **Environmental Science with Concentration in Geomatics B.Sc. Honours**
- **Environmental Science B.Sc. Major**

Program Requirements

Course Categories

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

Approved Courses Outside the Faculties of Science and Engineering and Design (approved by the Environmental Science Institute)	
Approved Environmental Science Electives (approved by the Environmental Science Institute)	
Free Electives (see Academic Regulations for the B.Sc.)	
Approved Science for Environmental Science	
Courses approved by the Institute of Environmental Science include the following that comply with the Academic Regulations for the B.Sc.:	
Biochemistry	
Biology	
Chemistry	
Computer Science	
Earth Science	
Environmental Science	
Geography	
Geomatics	
Mathematics and Statistics	
Physics	
Prohibited and Restricted Courses	
Technology, Society, Environment Studes (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.	

Environmental Science B.Sc. Honours (20.0 credits)

A. Credits Included in the Major CGPA (11.5 credits)		
1. 3.0 credits in:		3.0
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Methods	
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 3509 [0.5]	Group Research in Environmental Science	
2. 1.0 credit from:		1.0
ENSC 4906 [1.0]	Honours Research Project	
or		
ENSC 4909 [1.0]	Translational Approach to Indigenous Community Wellness	
or		
ENSC 4901 [0.5]	Directed Projects (and [0.5] credit Science faculty elective or science continuation at the 4000 level)	
3. 2.0 credits in:		2.0
BIOL 2600 [0.5]	Ecology	
CHEM 2302 [0.5]	Analytical Chemistry I	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
GEOG 2013 [0.5]	Weather and Water	
4. 1.0 credit from:		1.0
GEOG 3102 [0.5]	Geomorphology	
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3106 [0.5]	Aquatic Science and Management	
GEOG 3108 [0.5]	Soil Properties	
5. 1.0 credit from:		1.0
ERTH 2102 [0.5]	Mineralogy to Petrology	
ERTH 2105 [0.5]	Geodynamics	
ERTH 2312 [0.5]	Paleontology	
ERTH 2314 [0.5]	Sedimentation and Stratigraphy	
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3113 [0.5]	Geology of Human Origins	
ERTH 3205 [0.5]	Physical Hydrogeology	
6. 0.5 credit from:		0.5
BIOL 2201 [0.5]	Cell Biology and Biochemistry	
BIOL 2107 [0.5]	Fundamentals of Genetics	
7. 1.0 credit from Science Faculty Electives or Science Continuation Courses at the 4000 level		1.0
8. 2.0 credits from Science Faculty Electives or Science Continuation Courses		2.0
B. Credits Not Included in the Major CGPA (8.5 credits)		
9. 1.0 credit in:		1.0
MATH 1007 [0.5]	Elementary Calculus I	
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
10. 2.5 credits in:		2.5
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 1002 [0.5]	The Earth and Life Odyssey: A Journey Through Billions of Years	
11. 0.5 credit in:		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	

12. 1.5 credits in approved courses outside the faculties of Science and Engineering and Design (may include ISAP 1000)		1.5
13. 3.0 credits in free electives.		3.0
Total Credits		**20.0**

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

A. Credits Included in the Major CGPA (13 credits)

1. 3.0 credits in:		3.0
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Methods	
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 3509 [0.5]	Group Research in Environmental Science	
2. 1.0 credit from:		1.0
ENSC 4906 [1.0]	Honours Research Project	
or		
ENSC 4909 [1.0]	Translational Approach to Indigenous Community Wellness	
or		
ENSC 4901 [0.5] and a 0.5 credit Science faculty elective or science continuation at the 4000-level		
3. 2.0 credit in:		2.0
BIOL 2600 [0.5]	Ecology	
CHEM 2302 [0.5]	Analytical Chemistry I	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
GEOG 2013 [0.5]	Weather and Water	
4. 1.0 credit from:		1.0
GEOG 3102 [0.5]	Geomorphology	
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3106 [0.5]	Aquatic Science and Management	
GEOG 3108 [0.5]	Soil Properties	
5. 0.5 credit from:		0.5
ERTH 2102 [0.5]	Mineralogy to Petrology	
ERTH 2105 [0.5]	Geodynamics	
ERTH 2312 [0.5]	Paleontology	
ERTH 2314 [0.5]	Sedimentation and Stratigraphy	
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3113 [0.5]	Geology of Human Origins	
ERTH 3205 [0.5]	Physical Hydrogeology	
6. 0.5 credit from:		0.5
BIOL 2107 [0.5]	Fundamentals of Genetics	
BIOL 2201 [0.5]	Cell Biology and Biochemistry	
7. 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 II	
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	
8. 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		
9. 0.5 credit in:		0.5
CHEM 4800 [0.5]	Atmospheric Chemistry	

B. Credits not included in the Major CGPA (7.0 credits)

10. 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	
11. 2.5 credits in:		2.5
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 1002 [0.5]	The Earth and Life Odyssey: A Journey Through Billions of Years	
12. 0.5 credit in:		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
13. 1.5 credits in approved courses outside the faculties of Science and Engineering and Design (may include ISAP 1000)		1.5
14. 1.0 credit in free elective		1.0
Total Credits		**20.0**

Environmental Science with Concentration in Earth Sciences
B.Sc. Honours (20.0 credits)

A. Credits Included in the Major CGPA (10.5 credits)

1. 3.0 credits from:		3.0
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Methods	
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 3509 [0.5]	Group Research in Environmental Science	
2. 1.0 credit from:		1.0
ENSC 4906 [1.0]	Honours Research Project	

or		
ENSC 4909 [1.0]	Translational Approach to Indigenous Community Wellness	
or		
ENSC 4901 [0.5] and [0.5] credit Science faculty elective or science continuation at the 4000 level		
3. 2.0 credits in:		2.0
BIOL 2600 [0.5]	Ecology	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
GEOG 2013 [0.5]	Weather and Water	
GEOG 3108 [0.5]	Soil Properties	
4. 3.5 credits in:		3.5
ERTH 2102 [0.5]	Mineralogy to Petrology	
ERTH 2105 [0.5]	Geodynamics	
ERTH 2106 [0.5]	Geochemistry	
ERTH 2314 [0.5]	Sedimentation and Stratigraphy	
ERTH 2407 [0.5]	Structural Geology	
ERTH 3205 [0.5]	Physical Hydrogeology	
ERTH 3405 [0.5]	Geophysical Methods	
5. 1.0 credit in ERTH at the 4000-level		1.0
B. Credits Not Included in the Major CGPA (9.5 credits)		
6. 1.5 credits 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	
7. 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 1002 [0.5]	The Earth and Life Odyssey: A Journey Through Billions of Years	
PHYS 1007 [0.5]	Elementary University Physics I	
8. 1.5 credits from:		1.5
CHEM 2302 [0.5]	Analytical Chemistry I	
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 2802 [0.5]	Field Geology I	
ERTH 2312 [0.5]	Paleontology	
ERTH 3204 [0.5]	Mineral Deposits	
ERTH 3207 [0.5]	Metamorphic Petrology and Processes	
GEOG 3102 [0.5]	Geomorphology	
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3106 [0.5]	Aquatic Science and Management	
GEOM 3002 [0.5]	Introduction to Remote Sensing	
GEOM 3005 [0.5]	Geospatial Analysis	
9. 1.5 credits in approved courses outside the faculties of Science and Engineering and Design (may include ISAP 1000), including:		**1.5**
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
10. 1.0 credit in:		1.0
GEOM 1004 [0.5]	Maps, Satellites and the Geospatial Revolution	
GEOM 2008 [0.5]	Raster GIS: Pixels and Grids	
11. 1.0 credit in free elective		1.0
Total Credits		**20.0**

Environmental Science with Concentration in Ecology, Biodiversity and Conservation B.Sc. Honours (20.0 credits)

A. Credits Included in the Major CGPA (12.5 credits)		
1. 3.0 credits in:		3.0
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Methods	
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 3509 [0.5]	Group Research in Environmental Science	
2. 1.0 credit from:		1.0
ENSC 4906 [1.0]	Honours Research Project	
or		
ENSC 4909 [1.0]	Translational Approach to Indigenous Community Wellness	
or		
ENSC 4901 [0.5] and [0.5] credit Science faculty elective or science continuation at the 4000 level		
3. 2.0 credit in:		2.0
BIOL 2600 [0.5]	Ecology	
CHEM 2302 [0.5]	Analytical Chemistry I	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
GEOG 2013 [0.5]	Weather and Water	
4. 1.0 credit from:		1.0
GEOG 3102 [0.5]	Geomorphology	
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3106 [0.5]	Aquatic Science and Management	
GEOG 3108 [0.5]	Soil Properties	
5. 1.0 credit from:		1.0
ERTH 2102 [0.5]	Mineralogy to Petrology	
ERTH 2105 [0.5]	Geodynamics	
ERTH 2312 [0.5]	Paleontology	
ERTH 2314 [0.5]	Sedimentation and Stratigraphy	
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3113 [0.5]	Geology of Human Origins	
ERTH 3205 [0.5]	Physical Hydrogeology	
6. 0.5 credit from Science faculty elective or science continuation at the 4000 level		0.5
7. 4.0 credits in:		4.0
a. 1.5 credit in:		
BIOL 2001 [0.5]	Animals: Form and Function	
BIOL 2002 [0.5]	Plants: Form and Function	

BIOL 2201 [0.5]	Cell Biology and Biochemistry	
b. 0.5 credit from:		
BIOL 2303 [0.5]	Microbiology	
BIOL 3004 [0.5]	Insect Diversity	
BIOL 3102 [0.5]	Mycology	
c. 2.0 credits in a focus:		
Ecology focus:		
i) 0.5 credit in:		
BIOL 3604 [0.5]	Statistics for Biologists	
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. Credits Not Included in the Major CGPA (7.5 credits)		
8. 1.0 credit in:		1.0
MATH 1007 [0.5]	Elementary Calculus I	
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
9. 2.5 credits in:		2.5
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 1002 [0.5]	The Earth and Life Odyssey: A Journey Through Billions of Years	
10. 0.5 credit in:		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
11. 0.5 credit from:		0.5
BIOL 2107 [0.5]	Fundamentals of Genetics	
12. 1.5 credits in approved courses outside the faculties of Science and Engineering and Design (may include ISAP 1000)		1.5
13. 1.5 credit in free electives.		1.5
Total Credits		**20.0**

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

A. Credits Included in the Major CGPA (13.0 credits)		
1. 3.0 credits in:		3.0
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Methods	
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 3509 [0.5]	Group Research in Environmental Science	
2. 1.0 credit from:		1.0
ENSC 4906 [1.0]	Honours Research Project	
or		
ENSC 4909 [1.0]	Translational Approach to Indigenous Community Wellness	
or		
ENSC 4901 [0.5]	Directed Projects	
or		
GEOM 4005 [0.5]	Directed Studies in Geomatics	
and 0.5 credit 4000-level Approved Science for Environmental Science		
3. 2.0 credit in:		2.0
BIOL 2600 [0.5]	Ecology	
CHEM 2302 [0.5]	Analytical Chemistry I	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
GEOG 2013 [0.5]	Weather and Water	
4. 1.0 credit from:		1.0
GEOG 3102 [0.5]	Geomorphology	
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3106 [0.5]	Aquatic Science and Management	
GEOG 3108 [0.5]	Soil Properties	
5. 1.0 credit from:		1.0
ERTH 2312 [0.5]	Paleontology	
ERTH 2102 [0.5]	Mineralogy to Petrology	
ERTH 2105 [0.5]	Geodynamics	
ERTH 2314 [0.5]	Sedimentation and Stratigraphy	
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3113 [0.5]	Geology of Human Origins	
ERTH 3205 [0.5]	Physical Hydrogeology	
6. 3.5 credits in:		3.5
GEOM 1004 [0.5]	Maps, Satellites and the Geospatial Revolution	
GEOM 2005 [0.5]	Introduction to Geospatial Programming	
GEOM 2007 [0.5]	Vector GIS: Points, Lines and Polygons	
GEOM 2008 [0.5]	Raster GIS: Pixels and Grids	
GEOM 3002 [0.5]	Introduction to Remote Sensing	
GEOM 3005 [0.5]	Geospatial Analysis	
GEOG 3003 [0.5]	Quantitative Geography	
7. 1.5 credits from:		1.5
GEOM 4001 [0.5]	Special Topics in Geomatics	
GEOM 4003 [0.5]	Remote Sensing of the Environment	
GEOM 4008 [0.5]	Advanced Topics in Geographic Information Systems	
GEOM 4009 [0.5]	Custom Geomatics Applications	
B. Credits not included in the Major CGPA (7.0 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	
or GEOG 2006 [0	Introduction to Quantitative Research	
9. 2.5 credits in:		2.5
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 1002 [0.5]	The Earth and Life Odyssey: A Journey Through Billions of Years	
10. 0.5 credit in:		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
11. 0.5 credit from:		0.5
BIOL 2107 [0.5]	Fundamentals of Genetics	
BIOL 2201 [0.5]	Cell Biology and Biochemistry	
12. 1.5 credits in approved courses outside the faculties of Science and Engineering and Design (may include ISAP 1000)		1.5
13. 0.5 credit in free elective		0.5
Total Credits		**20.0**

Environmental Science B.Sc. Major (20.0 credits)

A. Credits Included in the Major CGPA (10.0 credits)		
1. 2.5 credits in:		2.5
ENSC 1500 [0.5]	Environmental Science Seminar	
ENSC 2000 [0.5]	Environmental Science Field Methods	
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	
2. 2.0 credit in:		2.0
BIOL 2600 [0.5]	Ecology	
CHEM 2302 [0.5]	Analytical Chemistry I	
CHEM 2800 [0.5]	Foundations for Environmental Chemistry	
GEOG 2013 [0.5]	Weather and Water	
3. 1.0 credit from:		1.0
GEOG 3102 [0.5]	Geomorphology	
GEOG 3103 [0.5]	Watershed Hydrology	
GEOG 3104 [0.5]	Principles of Biogeography	
GEOG 3105 [0.5]	Climate and Atmospheric Change	
GEOG 3106 [0.5]	Aquatic Science and Management	
GEOG 3108 [0.5]	Soil Properties	
4. 1.0 credit from:		1.0
ERTH 2102 [0.5]	Mineralogy to Petrology	
ERTH 2105 [0.5]	Geodynamics	
ERTH 2312 [0.5]	Paleontology	
ERTH 2314 [0.5]	Sedimentation and Stratigraphy	
ERTH 2402 [0.5]	Climate Change: An Earth Sciences Perspective	
ERTH 2403 [0.5]	Introduction to Oceanography	
ERTH 3113 [0.5]	Geology of Human Origins	
ERTH 3205 [0.5]	Physical Hydrogeology	
5. 0.5 credit from		0.5
BIOL 2107 [0.5]	Fundamentals of Genetics	
BIOL 2201 [0.5]	Cell Biology and Biochemistry	
6. 1.0 credits from Science faculty electives or science continuation at the 4000 level		1.0
7. 2.0 credits from Science faculty electives or science continuation courses		2.0
B. Credits Not Included in the Major CGPA (10.0 credits)		
8. 1.0 credit in:		1.0
MATH 1007 [0.5]	Elementary Calculus I	
STAT 2507 [0.5]	Introduction to Statistical Modeling I	
9. 2.5 credits in:		2.5
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 1002 [0.5]	The Earth and Life Odyssey: A Journey Through Billions of Years	
10. 0.5 credit in:		0.5
PHIL 2380 [0.5]	Introduction to Environmental Ethics	
11. 1.5 credits in approved courses outside the faculties of Science and Engineering and Design (may include ISAP 1000)		1.5
12. 4.5 credits in free electives.		4.5
Total Credits		**20.0**

B.Sc. Regulations

The regulations presented in this section apply to all Bachelor of Science programs. In addition to the requirements presented here, students must satisfy the University regulations common to all undergraduate students including the process of Academic Continuation Evaluation (see the *Academic Regulations of the University* section of this Calendar).

Breadth Requirement for the B.Sc.

Students in a Bachelor of Science program must present the following credits at graduation:

1. 2.0 credits in Science Continuation courses not in the major discipline; **students completing a double major are considered to have completed this requirement providing they have 2.0 credits in Science Continuation courses in each of the two majors;**
2. 2.0 credits in courses outside of the faculties of Science and Engineering and Design (may include ISAP 1000)

In most cases, the requirements for individual B.Sc. programs, as stated in this Calendar, contain these requirements, explicitly or implicitly.

Students admitted to B.Sc. programs by transfer from another institution must present at graduation (whether taken at Carleton or elsewhere):

1. 2.0 credits in courses outside of the faculties of Science and Engineering and Design (may include

ISAP 1000) if the student received fewer than 10.0 transfer credits; or,

2. 1.0 credit in courses outside of the faculties of Science and Engineering and Design (may include ISAP 1000) if the student received 10.0 or more transfer credits.

Declared and Undeclared Students

Degree students are considered "Undeclared" if they have been admitted to a degree, but have not yet selected and been accepted into a program within that degree. The status "Undeclared" is available only in the B.A. and B.Sc. degrees. Undeclared students must apply to enter a program upon or before completing 3.5 credits.

Change of Program within the B.Sc. Degree

To transfer to a program within the B.Sc. degree, applicants must normally be *Eligible to Continue* (EC) in the new program, by meeting the CGPA thresholds described in Section 3.1.9 of the *Academic Regulations of the University.*

Applications to declare or change programs within the B.Sc. degree must be made online through Carleton Central by completing a Change of Program Elements (COPE) application form within the published deadlines. Acceptance into a program, or into a program element or option, is subject to any enrolment limitations, and/or specific program, program element or option requirements as published in the relevant Calendar entry.

Minors, Concentrations, and Specializations

Students may add a Minor, Concentration, or Specialization by completing a Change of Program Elements (COPE) application form online through Carleton Central. Acceptance into a Minor, Concentration, or Specialization normally requires that the student be *Eligible to Continue* (EC) and is meeting the minimum CGPAs described in Section 3.1.9 of the *Academic Regulations of the University*, as well as being subject to any specific requirements of the intended Minor, Concentration, or Specialization as published in the relevant Calendar entry.

Experimental Science Requirement

Students in a B.Sc. degree program must present at graduation at least two full credits of Experimental Science chosen from two different departments or institutes from the list below:

Approved Experimental Science Courses

Biochemistry	
BIOC 2200 [0.5]	Cellular Biochemistry
BIOC 4001 [0.5]	Methods in Biochemistry
BIOC 4201 [0.5]	Advanced Cell Culture and Tissue Engineering
Biology	
BIOL 1103 [0.5]	Foundations of Biology I
BIOL 1104 [0.5]	Foundations of Biology II
BIOL 2001 [0.5]	Animals: Form and Function
BIOL 2002 [0.5]	Plants: Form and Function
BIOL 2104 [0.5]	Introductory Genetics
BIOL 2200 [0.5]	Cellular Biochemistry
BIOL 2600 [0.5]	Ecology
Chemistry	
CHEM 1001 [0.5]	General Chemistry I
CHEM 1002 [0.5]	General Chemistry II
CHEM 2103 [0.5]	Physical Chemistry I
CHEM 2203 [0.5]	Organic Chemistry I
CHEM 2204 [0.5]	Organic Chemistry II
CHEM 2302 [0.5]	Analytical Chemistry I
CHEM 2303 [0.5]	Analytical Chemistry II
CHEM 2800 [0.5]	Foundations for Environmental Chemistry
Earth Sciences	
ERTH 1002 [0.5]	The Earth and Life Odyssey: A Journey Through Billions of Years
ERTH 2102 [0.5]	Mineralogy to Petrology
ERTH 2404 [0.5]	Engineering Geoscience
ERTH 2802 [0.5]	Field Geology I
ERTH 3111 [0.5]	Vertebrate Evolution: Mammals, Reptiles, and Birds
ERTH 3112 [0.5]	Vertebrate Evolution: Fish and Amphibians
ERTH 3204 [0.5]	Mineral Deposits
ERTH 3205 [0.5]	Physical Hydrogeology
Food Sciences	
FOOD 3001 [0.5]	Food Chemistry
FOOD 3002 [0.5]	Food Analysis
FOOD 3005 [0.5]	Food Microbiology
Geography	
GEOG 1010 [0.5]	Global Environmental Systems
GEOG 3108 [0.5]	Soil Properties
Neuroscience	
NEUR 3206 [0.5]	Sensory and Motor Neuroscience
NEUR 3207 [0.5]	Systems Neuroscience
NEUR 4600 [0.5]	Advanced Lab in Neuroanatomy
Physics	
PHYS 1001 [0.5]	Foundations of Physics I
PHYS 1002 [0.5]	Foundations of Physics II
PHYS 1003 [0.5]	Introductory Mechanics and Thermodynamics
PHYS 1004 [0.5]	Introductory Electromagnetism and Wave Motion
PHYS 1007 [0.5]	Elementary University Physics I
PHYS 1008 [0.5]	Elementary University Physics II
PHYS 2202 [0.5]	Wave Motion and Optics
PHYS 2604 [0.5]	Modern Physics I
PHYS 3007 [0.5]	Third Year Physics Laboratory: Selected Experiments and Seminars
PHYS 3606 [0.5]	Modern Physics II
PHYS 3608 [0.5]	Modern Applied Physics

Course Categories for B.Sc. Programs

Science Geography Courses

GEOG 1010 [0.5]	Global Environmental Systems
GEOG 2006 [0.5]	Introduction to Quantitative Research
GEOG 2013 [0.5]	Weather and Water
GEOG 2014 [0.5]	The Earth's Surface
GEOG 3003 [0.5]	Quantitative Geography

GEOG 3010 [0.5]	Field Methods in Physical Geography
GEOG 3102 [0.5]	Geomorphology
GEOG 3103 [0.5]	Watershed Hydrology
GEOG 3104 [0.5]	Principles of Biogeography
GEOG 3105 [0.5]	Climate and Atmospheric Change
GEOG 3106 [0.5]	Aquatic Science and Management
GEOG 3108 [0.5]	Soil Properties
GEOG 4000 [0.5]	Field Studies
GEOG 4005 [0.5]	Directed Studies in Geography
GEOG 4013 [0.5]	Cold Region Hydrology
GEOG 4017 [0.5]	Global Biogeochemical Cycles
GEOG 4101 [0.5]	Two Million Years of Environmental Change
GEOG 4103 [0.5]	Water Resources Engineering
GEOG 4104 [0.5]	Microclimatology
GEOG 4108 [0.5]	Permafrost

Science Psychology Courses

PSYC 2001 [0.5]	Introduction to Research Methods in Psychology
PSYC 2002 [0.5]	Introduction to Statistics in Psychology
PSYC 2700 [0.5]	Introduction to Cognitive Psychology
PSYC 3000 [1.0]	Design and Analysis in Psychological Research
PSYC 3506 [0.5]	Cognitive Development
PSYC 3700 [1.0]	Cognition (Honours Seminar)
PSYC 3702 [0.5]	Perception
PSYC 2307 [0.5]	Human Neuropsychology I
PSYC 3307 [0.5]	Human Neuropsychology II

Science Continuation Courses

A course at the 2000 level or above may be used as a Science Continuation credit in a B.Sc. program if it is not in the student's major discipline, and is chosen from the following:

- BIOC (Biochemistry)
- BIOL (Biology) Biochemistry students may use BIOL 2005 only as a free elective.
- CHEM (Chemistry)
- COMP (Computer Science) A maximum of two half-credits at the 1000-level in COMP, excluding COMP 1001 may be used as Science Continuation credits.
- ERTH (Earth Sciences), except ERTH 2415 which may be used only as a free elective for any B.Sc. program. Students in Earth Sciences programs may use ERTH 2401, ERTH 2402, and ERTH 2403 only as free electives.
- Engineering. Students wishing to register in Engineering courses must obtain the permission of the Faculty of Engineering and Design.
- ENSC (Environmental Science)
- FOOD (Food Science and Nutrition)
- GEOM (Geomatics)
- HLTH (Health Sciences)
- ISAP (Interdisciplinary Science Practice)
- MATH (Mathematics)
- NEUR (Neuroscience)
- PHYS (Physics), except PHYS 2903
- Science Geography Courses (see list above)
- Science Psychology Courses (see list above)
- STAT (Statistics)
- TSES (Technology, Society, Environment) except TSES 2305. Biology students may use these courses only as free electives. Integrated Science and Environmental Science students may include these courses in their programs but may not count them as part of the Science Sequence.

Science Faculty Electives

Science Faculty Electives are courses at the 1000-4000 level chosen from:

- BIOC (Biochemistry)
- BIOL (Biology) Biology & Biochemistry students may use BIOL 1010 and BIOL 2005 only as free electives
- CHEM (Chemistry) except CHEM 1003, CHEM 1004 and CHEM 1007
- COMP (Computer Science) except COMP 1001
- ERTH (Earth Sciences) except ERTH 1004 and ERTH 2415. Earth Sciences students may use ERTH 2401, ERTH 2402 and ERTH 2403 only as free electives.
- Engineering
- ENSC 2001
- FOOD (Food Science and Nutrition)
- GEOM (Geomatics)
- HLTH (Health Science)
- ISAP (Interdisciplinary Science Practice)
- MATH (Mathematics)
- NEUR (Neuroscience)
- PHYS (Physics) except PHYS 1901, PHYS 1902, PHYS 1905, PHYS 2903
- Science Geography (see list above)
- Science Psychology (see list above)
- STAT (Statistics)
- TSES (Technology, Society, Environment) Biology students may use these courses only as free electives.

Advanced Science Faculty Electives

Advanced Science Faculty Electives are courses at the 2000-4000 level chosen from the Science Faculty Electives list above.

Approved Courses Outside the Faculties of Science and Engineering and Design (may include ISAP 1000)

All courses offered by the Faculty of Arts and Social Sciences, the Faculty of Public and Global Affairs, and the Sprott School of Business are approved as Arts or Social Sciences courses EXCEPT FOR: All Science Geography courses (see list above), all Geomatics (GEOM) courses, all Science Psychology courses (see list above). ISAP 1000 may be used as an Approved Course Outside the Faculties of Science and Engineering and Design.

Free Electives

Any course is allowable as a Free Elective providing it is not prohibited (see below). Students are expected to comply with prerequisite requirements and enrolment restrictions for all courses as published in this Calendar.

Courses Allowable Only as Free Electives in any B.Sc. Program

BIOL 4810 [0.5]	Education Research in Undergraduate Science
CHEM 1003 [0.5]	The Chemistry of Food, Health and Drugs
CHEM 1004 [0.5]	Drugs and the Human Body
CHEM 1007 [0.5]	Chemistry of Art and Artifacts
ERTH 1004 [0.5]	Earth's Epic Tale: A Story Across Billions of Years
ERTH 2415 [0.5]	Natural Disasters
ISCI 1001 [0.5]	Introduction to the Environment
ISCI 2000 [0.5]	Natural Laws
ISCI 2002 [0.5]	Human Impacts on the Environment
PHYS 1901 [0.5]	Planetary Astronomy
PHYS 1902 [0.5]	From our Star to the Cosmos
PHYS 1905 [0.5]	Physics Behind Everyday Life
PHYS 2903 [0.5]	Physics Towards the Future
Prohibited Courses	
The following courses are not acceptable for credit in any B.Sc. program:	
COMP 1001 [0.5]	Introduction to Computational Thinking for Arts and Social Science Students
MATH 1009 [0.5]	Mathematics for Business
MATH 1119 [0.5]	Linear Algebra: with Applications to Business
MATH 1401 [0.5]	Elementary Mathematics for Economics I
MATH 1402 [0.5]	Elementary Mathematics for Economics II
all 0000-level courses	

Co-operative Education

For more information about how to apply for the Co-op program and how the Co-op program works please visit the Co-op website.

All students participating in the Co-op program are governed by the Undergraduate Co-operative Education Policy.

Undergraduate Co-operative Education Policy

Admission Requirements

Students can apply to Co-op in one of two ways: directly from high school, or after beginning a degree program at Carleton.

If a student applies to a degree program with a Co-op option from high school, their university grades will be reviewed two terms to one year prior to their first work term to ensure they meet the academic requirements after their first or second year of study. The time at which the evaluation takes place depends on the program of study. Students will automatically receive an admission decision via their Carleton email account.

Students who did not request Co-op at the time they applied to Carleton can request Co-op after they begin their university studies. To view application instructions and deadlines, please visit carleton.ca/co-op.

To be admitted to Co-op, a student must successfully complete 5.0 or more credits that count towards their degree, meet the minimum CGPA requirement(s) for the student's Co-op option, and fulfil any specified course prerequisites. To see the unique admission and continuation requirements for each Co-op option, please refer to the specific degree programs listed in the Undergraduate Calendar.

Participation Requirements

Co-op Participation Agreement

All students must adhere to the policies found within the Co-op Participation Agreement.

COOP 1000

Once a student has been admitted to the Co-op Program, they will be given access to register in COOP 1000. This zero-credit online course must be completed at least two terms prior to the student's first work term.

Communication with the Co-op Office

Students must maintain contact with the Co-op Office during their job search and while on a work term. All email communication will be conducted via the students' Carleton email account.

Employment

Although every effort is made to ensure a sufficient number of job postings for all Co-op students, no guarantee of employment can be made. The Co-op job search process is competitive, and success is dependent upon factors such as current market conditions, academic performance, skills, motivation, and level of commitment to the job search. It is the student's responsibility to apply for positions via the Co-op job board in addition to actively conducting a self-directed job search. Students who do not obtain a co-op work term are expected to continue with their academic studies. It should be noted that hiring priority for positions within the Federal Government of Canada is given to Canadian citizens.

Registration

- Students must be registered as full-time during all fall and winter study terms beginning the term in which they enroll in COOP 1000.
- Students will be registered in a Co-op Work Term course while at work. This course does not carry academic course credit, but is noted on academic transcripts.
- Students may register in a 0.5 credit during a work term, provided the course is offered during the evening or is offered asynchronously online.
- Students must have at least one term of full-time studies left to complete following their final co-op work term. Students cannot end their degree on a work term.

Work Term Assessment and Evaluation

Work Term Evaluation

Employers are responsible for submitting to Carleton University final performance evaluations for their Co-op students at the end of their work terms.

Work Term Assessment

In order to successfully complete the co-op work term, students must receive a Satisfactory (SAT) grade on their Co-op Work Term Report, which they must submit at the completion of each four-month work term.

Graduation with the Co-op Designation

In order to graduate with the Co-op Designation, students must satisfy all requirements of the degree program in addition to the successful completion of three or four work terms (the number is dependent upon the student's academic program). Students found in violation of the Co-op Participation Agreement may have the Co-op Designation withheld.

Note: Participation in the co-op option will add up to one additional year for a student to complete their degree program.

Voluntary Withdrawal from the Co-op Option

Students who are currently on a co-op work term or who have already committed to a co-op work term either verbally or in writing may not leave the position and/or withdraw from the co-op option until they have completed the work term and all related requirements.

Involuntary or Required Withdrawal from the Co-op Option

Students may be removed from the Co-op Program for any of the following reasons:

1. Failure to achieve a grade of SAT in COOP 1000;
2. Failure to attend all interviews for positions to which the student has applied;
3. Declining more than one job offer during the job search;
4. Reneging on a co-op position that the student has accepted either verbally or in writing;
5. Continuing a job search after accepting a co-op position;
6. Dismissal from a work term by the co-op employer;
7. Leaving a work term without approval from the Co-op Management Team;
8. Receipt of an unsatisfactory work term evaluation;
9. Receiving a grade of UNS on the work term report.

International Students

All international students are required to possess a Co-op Work Permit issued by Immigration, Refugees and Citizenship Canada before they can begin working. The Co-operative Education Office will provide students with a letter of support to accompany their Co-op Work Permit application. Students are advised to discuss the application process and application requirements with the International Student Services Office.

Co-op Fees

All participating Co-op students are required to pay Co-op fees. For full details, please see the Co-op website.

B.Sc. Environmental Science: Co-op Admission and Continuation Requirements

- Maintain full-time status in each study term;
- Be eligible to work in Canada (for off-campus work);
- Have successfully completed COOP 1000 .

In addition to the following:

1. Registered as a full-time student in the B.Sc. Honours Environmental Science program;
2. Successfully completed 5.0 or more credits;
3. Obtained an Overall CGPA of at least 6.50 and a Major CGPA of at least 8.00. These CGPAs must be maintained throughout the duration of the degree.

B.Sc. Honours Environmental Science students must successfully complete three (3) work terms to obtain the Co-op Designation.

Work Term Course: ENSC 3999
Work/Study Pattern:

Year 1		Year 2		Year 3		Year 4		Year 5	
Term	**Pattern**	**Term**	**Pattern**	**Term**	**Pattern**	**Term**	**Pattern**	**Term**	**Pattern**
Fall	S	Fall	S	Fall	S	Fall	W	Fall	S
Winter	S	Winter	S	Winter	S	Winter	W	Winter	S
Summer		Summer	W	Summer	W	Summer	W		

Legend
S: Study
W: Work

Admissions Information

Admission Requirements are for the 2025-26 year only, and are based on the Ontario High School System. Holding the minimum admission requirements only establishes eligibility for consideration. The cut-off averages for admission may be considerably higher than the minimum. See also the **General Admission and Procedures** section of this Calendar. An overall average of at least 70% is normally required to be considered for admission. Some programs may also require specific course prerequisites and prerequisite averages and/or supplementary admission portfolios. Higher averages are required for admission to programs for which the demand for places by qualified applicants exceeds the number of places available. The overall average required for admission is determined each year on a program by program basis. Consult admissions.carleton.ca for further details.

Note: Courses listed as *recommended* are not mandatory for admission. Students who do not follow the recommendations will not be disadvantaged in the admission process.

Admissions Information

Admission requirements are based on the Ontario High School System. Prospective students can view the admission requirements through the Admissions website at admissions.carleton.ca. The overall average required for admission is determined each year on a program-by-program basis. Holding the minimum admission requirements only establishes eligibility for consideration; higher averages are required for

admission to programs for which the demand for places by qualified applicants exceeds the number of places available. All programs have limited enrolment and admission is not guaranteed. Some programs may also require specific course prerequisites and prerequisite averages and/or supplementary admission portfolios. Consult admissions.carleton.ca for further details.

Note: If a course is listed as *recommended*, it is not mandatory for admission. Students who do not follow the recommendations will not be disadvantaged in the admission process.

Degrees

- B.Sc. (Honours)
- B.Sc. (Major)
- B.Sc.

Admission Requirements

B. Sc. Honours

First Year

The Ontario Secondary School Diploma (OSSD) or equivalent including a minimum of six 4U or M courses. For most programs including Biochemistry, Bioinformatics, Biotechnology, Chemistry, Combined Honours in Biology and Physics, Chemistry and Physics, Computational Biochemistry, Food Science, Nanoscience, Neuroscience and Biology, Neuroscience and Mental Health, and Psychology, the six 4U or M courses must include Advanced Functions, and two of Biology, Chemistry, Earth and Space Sciences, or Physics. (Calculus and Vectors is strongly recommended).

Specific Honours Admission Requirements
For the Honours programs in Earth Sciences, Environmental Science, Geomatics, Integrated Science, and Physical Geography, Calculus and Vectors may be substituted for Advanced Functions.

For the Honours programs in Physics and Applied Physics, and for double Honours in Mathematics and Physics, Calculus and Vectors is required in addition to Advanced Functions and one of 4U Physics, Chemistry, Biology, or Earth and Space Sciences. For all programs in Physics, 4U Physics is strongly recommended.

For Honours in Psychology, a 4U course in English is recommended.

For Honours in Environmental Science, a 4U course in Biology and Chemistry is recommended.

Advanced Standing

Applications for admission beyond first year will be assessed on their merits. Applicants must normally be *Eligible to Continue* in their year level, in addition to meeting the CGPA thresholds described in Section 3.1.9 of the Academic Regulations of the University. Advanced standing will be granted only for those subjects deemed appropriate for the program and stream selected.

B.Sc. Major and B.Sc.

First Year

The Ontario Secondary School Diploma (OSSD) or equivalent including a minimum of six 4U or M courses. The six 4U or M courses must include Advanced Functions and two of Calculus and Vectors, Biology, Chemistry, Earth and Space Science, or Physics (Calculus and Vectors is strongly recommended). For the B.Sc. Major in Physics, 4U Physics is strongly recommended.

Advanced Standing

Applications for admission beyond first year will be assessed on their merits. Applicants must normally be *Eligible to Continue* (EC) in their year level. Advanced standing will be granted only for those subjects deemed appropriate for the program and stream selected.

Co-op Option

Direct Admission to the First Year of the Co-op Option
Applicants must:

1. meet the required overall admission cut-off average and prerequisite course average. These averages may be higher than the stated minimum requirements;
2. be registered as a full-time student in the Bachelor of Science Honours program;
3. be eligible to work in Canada (for off-campus work placements).

Note that meeting the above requirements only establishes eligibility for admission to the program. The prevailing job market may limit enrolment in the co-op option.

Note: continuation requirements for students previously admitted to the co-op option and admission requirements for the co-op option after beginning the program are described in the Co-operative Education Regulations section of this Calendar.

Environmental Science (ENSC) Courses

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.
Includes: Experiential Learning Activity
Prerequisite(s): enrolment in the Environmental Science program.
Lectures, seminars and workshops four hours a week.

ENSC 2000 [0.5 credit]
Environmental Science Field Methods
A field-based course introducing students to practical methods in environmental science. Topics will include earth sciences, geography, biology, and chemistry related aspects of environmental sciences and will focus on quantitative techniques to assess environmental impacts and management. A supplementary fee will apply.
Includes: Experiential Learning Activity
Prerequisite(s): ERTH 1002 and BIOL 1004 or BIOL 1104, CHEM 1001 and CHEM 1002 and permission of the Institute.
Field trips, lectures and workshops, seven hours per week (delivered on a single day and on up to two mandatory weekend trips).

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 study design, data collection and assembly, database manipulation, data analysis, and critically evaluating scientific information.
Includes: Experiential Learning Activity
Prerequisite(s): STAT 2507 or permission from 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.

Includes: Experiential Learning Activity
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 3002 [0.5 credit]
Applied Data Analysis
Data analysis strategies to tackle real-world, wicked problems. Includes a hands-on applied environmental data science project with a variety of partners. Topics include: obtaining and working with data, exploring causal relationships, data ethics, communicating data, and moving from data to information to action.
Includes: Experiential Learning Activity
Also listed as ISAP 3001.
Prerequisite(s): STAT 2507.
Lecture three hours per week.

ENSC 3106 [0.5 credit]
Aquatic Science and Management
Fundamentals of aquatic science. The physical, chemical, and biotic aspects of lake, river, and estuary systems including human impacts, management and conservation.
Includes: Experiential Learning Activity
Also listed as GEOG 3106.
Prerequisite(s): third-year standing and a second year science or engineering course.
lectures, three hours per week

ENSC 3509 [0.5 credit]
Group Research in Environmental Science
Major project relating to an issue involving environmental science; effective methods of team research and presentation of group work. May include field work during class time or on weekends.
Includes: Experiential Learning Activity
Prerequisite(s): third-year standing in the Honours 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]
Project Planning for Environmental Research
Independent or group study on the fundamentals of scientific investigation, which may include use of literature, learning of research techniques, and development of a research proposal, in consultation with a Faculty supervisor. May include directed reading, written assignments, tutorials, laboratory or field work.
Includes: Experiential Learning Activity
Prerequisite(s): Good standing in third year Environmental Science and permission of the Institute.

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

ENSC 4001 [0.5 credit]
Environmental Science Practicum
Experience working in the environmental science sector, applying academic training to practical environmental issues. Graded Sat/Uns.
Includes: Experiential Learning Activity
Prerequisite(s): fourth-year standing in the Environmental Science program.
practicum

ENSC 4002 [0.5 credit]
Environmental Decisions
The regulatory and scientific aspects of environmental management decisions, including risk analysis and mitigation, managing chronic and acute environmental impacts, and conservation of species and landscapes. Students will use real-world case studies to learn traditional and cutting-edge decision-making tools.
Includes: Experiential Learning Activity
Prerequisite(s): third-year standing in any B.Sc. program or permission of the Institute.
Workshops three hours per week.

ENSC 4003 [0.5 credit]
Food Systems and the Environment
This course explores issues of food systems and their sustainability. We will discuss aspects of food systems, including production, distribution, consumption, waste management, and their impact on communities and the environment.
Includes: Experiential Learning Activity
Prerequisite(s): third year standing in B.Sc. or B.HSc. program or permission of the Institute.
Lecture three hours per week.

ENSC 4005 [0.5 credit]
Environmental Solutions and Sustainability Science
Focus on conceptualization and application of different knowledges and knowledge systems to complex, interdisciplinary real-world problems through an environmental lens. Development of skills and mindset needed to generate creative solutions that will be embraced by diverse publics and decision makers.
Includes: Experiential Learning Activity
Precludes additional credit for ENSC 4700A if taken in Winter term 2021 or Winter term 2022.
Prerequisite(s): Third year standing in B.Sc. programs in Environmental Science, Interdisciplinary Science and Practice, Earth Science, Biology, and Geography and B.A. programs in Biology and Geography, or permission of the Institute.
Lecture, seminar, or workshops three hours a week.

ENSC 4700 [0.5 credit]
Topics in Environmental Science
Prerequisite(s): 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 students to explore a particular project, in consultation with a Faculty supervisor. May include directed reading, written assignments, tutorials, laboratory or field work.
Includes: Experiential Learning Activity
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 registration.
Includes: Experiential Learning Activity
Prerequisite(s): fourth-year standing in the Honours Environmental Science program, a major CGPA 8.0 and permission of the Institute.
independent study

ENSC 4909 [1.0 credit]
Translational Approach to Indigenous Community Wellness
This course involves co-developing an Indigenous community-led process or product that addresses a current and specific mental health issue. Involves working in interdisciplinary groups with a community partner.
Includes: Experiential Learning Activity.
Includes: Experiential Learning Activity
Also listed as ISAP 4909, MPAD 4906, NEUR 4906.
Precludes additional credit for ENSC 4906, ISAP 4906, ISAP 4907, ISAP 4908, NEUR 4905, NEUR 4907, NEUR 4908.
Prerequisite(s): Fourth-year standing with a minimum Major CGPA of 10.0 in the Honours Environmental Science program and permission of the instructor.
Seminars or workshops three hours a week. A field trip to the partner community is typically required.