# 2007-2008 Undergraduate Calendar

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2007-2008 academic year, including the Summer Semester 2007, the Fall Semester 2007 and the Winter Semester 2008. For your convenience the Undergraduate Calendar is available in PDF format.

If you wish to link to the Undergraduate Calendar please refer to the Linking Guidelines.

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# Disclaimer

## **University of Guelph 2007**

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2007-2008 academic year, including the Summer Semester 2007, the Fall Semester 2007 and the Winter Semester 2008.

The University reserves the right to change without notice any information contained in this calendar, including any rule or regulation pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or diplomas in any or all of its programs. The publication of information in this calendar does not bind the University to the provision of courses, programs, schedules of studies, or facilities as listed herein.

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### Address for University Communication

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### **Email Address**

The University issued email address is considered an official means of communication with the student and will be used for correspondence from the University. Students are responsible for monitoring their University-issued email account regularly. See Section I--Statement of Students' Academic Responsibilities for more information.

### **Home Address**

Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through Undergraduate Program Services.

### Name Changes

The University of Guelph is committed to the integrity of its student records, therefore, each student is required to provide either on application for admission or on personal data forms required for registration, his/her complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation.

### Student Confidentiality and Release of Student Information Policy Excerpt

The University undertakes to protect the privacy of each student and the confidentiality of his or her record. To this end the University shall refuse to disclose personal information to any person other than the individual to whom the information relates where disclosure would constitute an unjustified invasion of the personal privacy of that person or of any other individual. All members of the University community must respect the confidential nature of the student information which they acquire in the course of their work. Complete policy at http://www.uoguelph.ca/policies.

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# **Bachelor of Science in Environmental Sciences** [B.Sc.(Env.)]

### **Program Information**

### **Objectives of the Program**

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

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

Substantial emphasis is placed on communication skills, including the development of competence in both written and oral presentations. These skills will be progressively developed in core courses from the first to the fourth year. Students in the final years of their program will be expected to take part in more intensive communication skill development. Graduates will seek employment in a range of fields, from government agencies to private industry and research.

### Academic Counselling

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

### Degree

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

### **Continuation of Study**

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

### **Conditions for Graduation**

In order to graduate from the B.Sc.(Env.) program, students must successfully complete a minimum of 20.00 credits including all the stated course requirements for the program. As well, students must achieve a cumulative average of 60% or higher over all course attempts.

### **Environmental Sciences (Co-op)**

Office of the Associate Dean, Faculty of Environmental Sciences.

A 5-year Honours Program in Environmental Sciences is offered as a Co-operative Education Program. This option is offered within the B.Sc. (Env.) degree and is available to all majors. The program requirements are the same as those listed for the regular B.Sc. (Env.) program, by the Co-operative Education Program and as outlined in the Continuation of Study policy (Section VIII--Undergraduate Degree Regulations & Procedures).

3 co-op work terms (COOP\*1000, COOP\*2000, COOP\*3000) are required. An optional 4th co-op work term (COOP\*4000) is available. COOP\*1100 must be completed during semester 2.

Year	Fall	Fall Winter	
1	Academic Term 1	Academic Term 2	Off
2	Academic Term 3	COOP*1000	Academic Term 4
3	COOP*2000	Academic Term 5	COOP*3000
4	Academic Term 6	Academic Term 7	COOP*4000 (Optional)
5	Academic Term 8		

Since some of the program requirements in the degree program (core or major) are not offered each semester, careful planning and program consultation with the Faculty Co-op Advisor is essential. In particular, students are encouraged to seek advice when choosing for their Summer academic semester.

### The Environmental Sciences Program

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

- 1. 5.00 First Year Curriculum
- 2. 5.00 Environmental Sciences Core
- 3. 7.00 Environmental Sciences Major
- 4. free electives\*

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

\* There are not specific subject requirements for the elective courses, however, you may NOT select the following: BOT\*1200, CHEM\*1100, CIS\*1000, GEOL\*1100,

MATH\*1050, MET\*1000, MICR\*1010, MICR\*1020, MBG\*1000, PHYS\*1600, ZOO\*1500.

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

### **First Year Curriculum**

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

### Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2		
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Note: Co-on stu	dents must s	elect COOP*1100 Introduction to Co-operative Educati

### **Environmental Sciences Core**

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

BIOL*2060	[0.50]	Ecology	
ENVS*2150	[0.50]	Terrestrial Systems	
ENVS*3150	[0.50]	Aquatic Systems	
ENVS*3160	[0.50]	Atmospheric Systems	
ENVS*4011/2	[0.50]	Project in Environmental Sciences	
ENVS*4300	[0.50]	Environmental Law & Regulation	
PHIL*2070	[0.50]	Philosophy of the Environment	
One of:			
AGEC*2700	[0.50]	Survey of Natural Resource Economics	
ECON*2100	[0.50]	Economic Growth and Environmental Quality	
One of:			
GEOG*3210	[0.50]	Management of the Biophysical Environment	
POLS*3370	[0.50]	Environmental Policy Formation and Administration	
ZOO*4050	[0.50]	Natural Resources Policy	
One of:			
ECON*2740	[0.50]	Economic Statistics	
GEOG*2460	[0.50]	Analysis in Geography	
STAT*2040	[0.50]	Statistics I	
Note: the statistics course required is prescribed by the student's choice of major.			

#### **Environmental Sciences Majors**

Earth and Atmospheric Science

Ecology

Environmental Biology

Environmental Economics and Policy

Environmental Geography

Environmental Monitoring and Analysis

Environmetrics and Modelling

Natural Resources Management

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

### Earth and Atmospheric Science (EAAS)

### Department of Land Resource Science, Ontario Agricultural College

### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

In this major there are fees charged to cover partial costs of some field trips. Students in need of financial assistance should approach the Chair of the department offering the course.

### Semester 1

I

Semester 2		
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Semester 3		
ENVS*2150	[0.50]	Terrestrial Systems
GEOL*1050	[0.50]	Geology and the Environment
MET*2030	[0.50]	Meteorology and Climatology
STAT*2040	[0.50]	Statistics I
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
Semester 4		
BIOL*2060	[0.50]	Ecology
GEOL*3060	[0.50]	Groundwater
SOIL*2010	[0.50]	Soil Science
One of:		
MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II
STAT*2050	[0.50]	Statistics II
0.50 electives or re	stricted elec	ctives
Semester 5		
GEOL*2110	[0.50]	Earth Material Science
One of:		
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
1.50 electives or re	stricted elec	ctives
Note: ZOO*4050 n	nay be subs	tituted for GEOG*3210 or POLS*3370 and would be taken
in Semester 8.		
Semester 6		
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
PHIL*2070	[0.50]	Philosophy of the Environment
SOIL*3600	[0.50]	Remote Sensing
0.50 electives or re	stricted elec	ctives
Semester 7		
ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation
SOIL*4250	[0.50]	Soils in the Landscape
1.50 electives or re	stricted elec	ctives
Semester 8		
ENVS*4012	[0.50]	Project in Environmental Sciences
2.00 electives or re	stricted elec	ctives
<b>Restricted Elect</b>	ives	
Students in the Ear	th and Atm	ospheric Science major are required to choose 2.50 credits
from the following	lists. Stude	nts are encouraged to seek advice on their choices and are
reminded that 6.00	credits of	their B.Sc.(Env.) degree must be at the 3000-4000 level.
With prior approva	ıl, students	may be able to use courses not on this list towards their
Earth and Atmosph	eric Scienc	e restricted electives.
List A - Environ	imental G	eology
GEOL*2020	[0.50]	Stratigraphy
GEOL*2200	[0.50]	Glacial Geology
GEOL*3100	[0.50]	Non-Renewable Earth Resources
GEOL*3130	[0.50]	Agrogeology

		25
GEOL*3100	[0.50]	Non-Renewable Earth Resources
GEOL*3130	[0.50]	Agrogeology
GEOL*4090	[0.50]	Sedimentology
GEOL*4130	[0.50]	Clay and Humic Chemistry
List B - Soil Sc	eience	
PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*3170	[0.50]	Soil Processes in Landscape
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management
List C - Water		
ENGG*2550	[0.50]	Water Management
ENGG*3650	[0.50]	Hydrology
GEOG*4150	[0.50]	Sedimentary Processes
GEOL*3190	[0.50]	Environmental Water Chemistry
SOIL*3080	[0.50]	Soil and Water Conservation

#### List D - Atmosphere

Forth and	Atmospher	ria Sajanaa (FAAS:C)
MET*4300	[0.50]	Atmospheric Transport and Chemistry
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*3050	[0.50]	Microclimatology
	-	

### Earth and Atmospheric Science (EAAS:C) Department of Land Resource Science, Ontario Agricultural College

### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

In this major there are fees charged to cover partial costs of some field trips. Students in need of financial assistance should approach the Chair of the department offering the course.

#### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2 - W	inter	
BIOI *1040	[0 50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.30]	Introduction to Co. anomative Education
COOF 1100	[0.00]	Introduction to Co-operative Education
CEOC*1200	[0.50]	Introductory Microeconomics
DUVC*1500	[0.50]	Division with Applications
Someston 3 Fe	[0.30]	Physics with Applications
Semester 5 - Fa	111	
ENVS*2150	[0.50]	Terrestrial Systems
GEOL*1050	[0.50]	Geology and the Environment
MET*2030	[0.50]	Meteorology and Climatology
STAT*2040	[0.50]	Statistics I
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
Winter Semest	er	
COOP*1000	[0.0]	Co-op Work Term I
Semester 4 - Su	immer	1
PIOI *2060	[0 50]	Faalagy
DIUL 2000	[0.50]	Philosophy of the Environment
SOIL *2010	[0.50]	Soil Soioneo
1 00 electives or r	[0.50]	
Foll Somestor	estituted ele	cuves
ran Semester		
COOP*2000	[0.00]	Co-op Work Term II
Semester 5 - W	inter	
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
GEOL*3060	[0.50]	Groundwater
SOIL*3600	[0.50]	Remote Sensing
One of:		-
MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II
STAT*2050	[0.50]	Statistics II
Summer Seme	ster	
COOD*2000	100.001	Co. on Work Term III
	[0.00]	co-op work term m
Semester o - ra	111	
ENVS*4011	[0.00]	Project in Environmental Sciences
GEOL*2110	[0.50]	Earth Material Science
One of:		
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
1.50 electives or r	estricted ele	octives
Note: ZOO*4050	may be subs	stituted for GEOG*3210 or POLS*3370 and would be taken
in Semester 7.		
Semester 7 - W	inter	
ENVS*4012	[0 50]	Project in Environmental Sciences
2 00 electives or r	estricted ele	riojeet in Environmental Sciences
Summer Seme	estar (Ontid	anal)
COOP*4000	[0.00]	Co-op Work Term IV
Semester 8 - Fa	all	
ENVS*4300	[0.50]	Environmental Law & Regulation
SOIL*4250	[0.50]	Soils in the Landscape
1.50 electives or r	estricted ele	ctives

### **Restricted Electives**

Students in the Earth and Atmospheric Science major are required to choose 2.50 credits from the following lists. Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of the B.Sc.(Env.) degree must be at the 3000-4000 level. With prior approval, students may be able to use courses not on this list towards their Earth and Atmospheric Science restricted electives.

### List A - Environmental Geology

LIST A - EIIVITU	mmentai	Geology
GEOL*2020	[0.50]	Stratigraphy
GEOL*2200	[0.50]	Glacial Geology
GEOL*3100	[0.50]	Non-Renewable Earth Resources
GEOL*3130	[0.50]	Agrogeology
GEOL*4090	[0.50]	Sedimentology
GEOL*4130	[0.50]	Clay and Humic Chemistry
List B - Soil Sc	ience	
PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*3170	[0.50]	Soil Processes in Landscape
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management
List C - Water		
ENGG*2550	[0.50]	Water Management
ENGG*3650	[0.50]	Hydrology
GEOG*4150	[0.50]	Sedimentary Processes
GEOL*3190	[0.50]	Environmental Water Chemistry
SOIL*3080	[0.50]	Soil and Water Conservation
List D - Atmos	phere	
MET*3050	[0.50]	Microclimatology
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry
Ecology (ECO	OL)	

#### **College of Biological Science**

Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

### Semester 1

PIOI *1020	[0.50]	Piology I
DIOL 1030	[0.50]	Gan anal Changiatana I
CHEMI*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2		
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Semester 3		
BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*2300	[0.50]	Chemical Reactivity
ENVS*2150	[0.50]	Terrestrial Systems
STAT*2040	[0.50]	Statistics I
One of:		
CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
Semester 4		
BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*3110	[0.50]	Population Ecology
MBG*2000	[0.50]	Introductory Genetics
STAT*2050	[0.50]	Statistics II
0.50 electives		
Semester 5		
BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
One of:		
BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I
One of:	. ,	1 5 65
MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution
One of:		
BOT*3410	[0 50]	Plant Anatomy

ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
Semester 6		
BIOL*3120	[0.50]	Community Ecology
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
PHIL*2070	[0.50]	Philosophy of the Environment
0.50 electives		
Semester 7		
BIOL*4110	[0.75]	Ecological Methods
ENVS*4011	[0.00]	Project in Environmental Sciences
One of:		
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
1.25 electives		
Note: ZOO*4050	may be subs	tituted for GEOG*3210 or POLS*3370 and would be taken
in Semester 8.		
Semester 8		
BIOL*4120	[0.50]	Evolutionary Ecology
ENVS*4012	[0.50]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation
1.00 electives		
Note: Ecology ma	ajors are not	required to complete BIOL*2060 as a core course.
Ecology (ECO	OL:C)	
College of Biolog	ical Scienco	

### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2 - Wi	inter	
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Semester 3 - Fal	11	
BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*2300	[0.50]	Chemical Reactivity
ENVS*2150	[0.50]	Terrestrial Systems
STAT*2040	[0.50]	Statistics I
One of:		
CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
Winter Semeste	r	
COOP*1000	[0.00]	Co-op Work Term I
Semester 4 - Su	mmer	
BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
PHIL*2070	[0.50]	Philosophy of the Environment
1.00 electives		
Fall Semester		
COOP*2000	[0.00]	Co-op Work Term II
Semester 5 - Wi		
	inter	
BIOL*3110	<b>inter</b> [0.50]	Population Ecology
BIOL*3110 ENVS*3150	inter [0.50] [0.50]	Population Ecology Aquatic Systems
BIOL*3110 ENVS*3150 ENVS*3160	[0.50] [0.50] [0.50]	Population Ecology Aquatic Systems Atmospheric Systems
BIOL*3110 ENVS*3150 ENVS*3160 STAT*2050	[0.50] [0.50] [0.50] [0.50] [0.50]	Population Ecology Aquatic Systems Atmospheric Systems Statistics II
BIOL*3110 ENVS*3150 ENVS*3160 STAT*2050 0.50 electives	[0.50] [0.50] [0.50] [0.50]	Population Ecology Aquatic Systems Atmospheric Systems Statistics II
BIOL*3110 ENVS*3150 ENVS*3160 STAT*2050 0.50 electives <b>Summer Semes</b>	[0.50] [0.50] [0.50] [0.50] [0.50] ter	Population Ecology Aquatic Systems Atmospheric Systems Statistics II
BIOL*3110 ENVS*3150 ENVS*3160 STAT*2050 0.50 electives Summer Semest COOP*3000	inter [0.50] [0.50] [0.50] [0.50] ter [0.00]	Population Ecology Aquatic Systems Atmospheric Systems Statistics II Co-op Work Term III
BIOL*3110 ENVS*3150 ENVS*3160 STAT*2050 0.50 electives Summer Semesi COOP*3000 Semester 6 - Fai	[0.50] [0.50] [0.50] [0.50] [0.50] <b>ter</b> [0.00]	Population Ecology Aquatic Systems Atmospheric Systems Statistics II Co-op Work Term III
BIOL*3110 ENVS*3150 ENVS*3160 STAT*2050 0.50 electives Summer Semesi COOP*3000 Semester 6 - Fal BIOL*3010	inter [0.50] [0.50] [0.50] [0.50] ter [0.00] <b>11</b>	Population Ecology Aquatic Systems Atmospheric Systems Statistics II Co-op Work Term III

ENVS*4011	[0.00]	Project in Environmental Sciences
One of:		
MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution
One of:		
BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I
One of:		
BOT*3410	[0.50]	Plant Anatomy
ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
Semester 7 - W	inter	
BIOL*3120	[0.50]	Community Ecology
BIOL*4120	[0.50]	Evolutionary Ecology
ENVS*4012	[0.50]	Project in Environmental Sciences
1.00 electives		-
Summer Semes	ster (Optio	onal)
COOP*4000	[0.00]	Co-op Work Term IV
Semester 8- Fa	11	
BIOL*4110	[0.75]	Ecological Methods
ENVS*4300	[0.50]	Environmental Law & Regulation
One of:		C C
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
0.75 electives	_	-
Note: ZOO*4050	may be subs	stituted for GEOG*3210 or POLS*3370 and would be taken
in Semester 7.	•	

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

### **Environmental Biology (ENVB)**

Department of Environmental Biology, Ontario Agricultural College

#### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

Sem	ester	T
Jem	cott	

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2		
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Semester 3		
CHEM*2300	[0.50]	Chemical Reactivity
ENVS*2150	[0.50]	Terrestrial Systems
TOX*2000	[0.50]	Principles of Toxicology
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
0.50 electives or re	stricted ele	ctives
Semester 4		
BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2060	[0.50]	Ecology
MBG*2000	[0.50]	Introductory Genetics
STAT*2040	[0.50]	Statistics I
0.50 electives or re	stricted ele	ctives
Semester 5		
One of:		
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
2.00 electives or re	stricted ele	ctives
Note: ZOO*4050 r	nay be subs	tituted for GEOG*3210 or POLS*3370 and would be taken
in Semester 8.		
Semester 6		
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems

PHIL*2070	[0.50]	Philosophy of the Environment
1.00 electives or re	estricted ele	ctives
Semester 7		
ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation
2.00 electives or re	estricted ele	ctives
Semester 8		
ENVS*4012	[0.50]	Project in Environmental Sciences
2.00 electives or re	estricted ele	ctives
<b>Restricted Elect</b>	tives	
Students in the En	vironmenta	Biology major are required to choose 5.00 credits from
the following list. S	tudents are	encouraged to seek advice on their choices and are reminded
that 6.00 credits of	the B.Sc.(1	Env.) degree must be at the 3000-4000 level.
BIOL*3130	[0.50]	Conservation Biology *
BIOL*3450	[0.50]	Introduction to Aquatic Environments
BIOL*4060	[0.50]	Restoration Ecology *
BIOL*4150	[0.50]	Wildlife Conservation and Management
ENVB*2010	[0.50]	Food Production and the Environment
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3010	[0.50]	Climate Change Biology
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*3250	[0.50]	Forest Health and Disease
ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*4020	[0.50]	Water Quality and Environmental Management *
ENVB*4130	[0.50]	Chemical Ecology: Principles & Practice *
ENVB*4240	[0.50]	Biological Activity of Pesticides
ENVB*4550	[0.50]	Ecotoxicological Risk Characterization *
ENVB*4780	[0.50]	Forest Ecology *
ENVS*4220	[0.50]	Environmental Impact Assessment
GEOG*3020	[0.50]	Global Environmental Change
GEOL*3190	[0.50]	Environmental Water Chemistry
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants *
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
SOIL*3080	[0.50]	Soil and Water Conservation *
IUX*3360	10.501	Environmental Chemistry and Toxicology

TOX\*3360[0.50]Environmental Chemistry and ToxicologyZOO\*4350[0.50]Biology of Polluted Waters \*

\* **Note:** Students should note that some restricted electives (marked by asterisks \*) require other restricted electives as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements.

#### **Environmental Biology (ENVB:C)**

Semester 1 - Fall

Department of Environmental Biolog	gy, Ontario Agricultural College
Maior	

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2 - W	inter	
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Semester 3 - Fa	all	
CHEM*2300	[0.50]	Chemical Reactivity
ENVS*2150	[0.50]	Terrestrial Systems
TOX*2000	[0.50]	Principles of Toxicology
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
0.50 electives or r	estricted ele	ectives
Winter Semest	er	
COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - S	Summer		Semester 1		
BIOC*2580	[0.50]	Introductory Biochemistry	BIOL*1030	[0.50]	Biology I
BIOL*2060	[0.50]	Ecology	CHEM*1040	[0.50]	General Chemistry I
MBG*2000	[0.50]	Introductory Genetics	ENVS*1020	[0.50]	Introduction to Environmental Sciences
STAT*2040	[0.50]	Statistics I	MATH*1080	[0.50]	Elements of Calculus I
0.50 electives or	restricted e	lectives	PHYS*1080	[0.50]	Physics for Life Sciences
Fall Semester			Semester 2		
COOP*2000	[0.00]	Co-op Work Term II	BIOL*1040	[0.50]	Biology II
Semester 5 - V	Winter		CHEM*1050	[0.50]	General Chemistry II
ENVS*3150	[0.50]	Aquatic Systems	ECON*1050	[0.50]	Introductory Microeconomics
ENVS*3160	[0.50]	Atmospheric Systems	GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHIL*2070	[0.50]	Philosophy of the Environment	PHIS*1130	[0.50]	Physics with Applications
One of:	50 50		Semester 5	F0 <b>F</b> 03	
GEOG*3210	[0.50	Management of the Biophysical Environment	AGEC*2700	[0.50]	Survey of Natural Resource Economics
POLS*3370	[U.50]	Environmental Policy Formation and Administration	ECON*1100 ECON*2100	[0.50]	Introductory Macroeconomics
Note: ZOO*405	0 may be su	lectives betituted for GEOG*3210 or POL \$*3370 and would be taken	ECON*2100 ENVS*2150	[0.50]	Terrestrial Systems
in Semester 7	0 may be su	Ustituted for GEOG 5210 of 1 OES 5570 and would be taken	0.50 electives or i	restricted ele	actives
Summer Sem	ester		Semester 4	restricted en	
	[0 00]	Co. on Work Torm III		[0 50]	Faclory
Somestor 6	[0.00] Zall	co-op work renn m	ECON*2310	[0.50]	Intermediate Microeconomics
Semester 0 - 1	ran		ECON*2740	[0.50]	Economic Statistics
ENVS*4011	[U.UU]	Project in Environmental Sciences	PHIL*2070	[0.50]	Philosophy of the Environment
2.50 electives of	Winton	lectives	0.50 electives or	restricted ele	ectives
Semester 7 - V			Note: STAT*204	0 may be su	bstituted for ECON*2740.
ENVS*4012	[0.50]	Project in Environmental Sciences	Semester 5		
ENVS*4300	[U.50] restricted a	Environmental Law & Regulation	AGEC*3190	[0.50]	Markets, Firms & Natural Amenities
Summer Sem	$ostor - (\Omega)$	ational)	AGEC*4290	[0.50]	Land Economics
	[0 00]	Concern Work Town W	ECON*2410	[0.50]	Intermediate Macroeconomics
COOP*4000	[0.00] Zall	Co-op work Term IV	ECON*2770	[0.50]	Introductory Mathematical Economics
Semester o - r			One of:		
2.50 electives or	restricted e	lectives	GEOG*3210	[0.50]	Management of the Biophysical Environment
Restricted Ele	ecuves		POLS*3370	[0.50]	Environmental Policy Formation and Administration
Students in the	Environmer	tal Biology major are required to choose 5.00 credits from	Note: AGEC*42	90 is taught ) may be sub	in even-numbered years.
the following list	the following list. Students are encouraged to seek advice on their choices and are reminded			may be sub	situled for GEOG 5210 of 1 OES 5570 and would be taken
that 6.00 credits	of the B.Sc	(Env.) degree must be at the 3000-4000 level.	Semester 6		
BIOL*3130	[0.50]	Conservation Biology *	AGEC*3170	[0 50]	Cost Bonafit Analysis
BIOL*3430 BIOL *4060	[0.50]	Restoration Ecology *	ECON*3740	[0.50]	Introduction to Econometrics
BIOL*4000 BIOL*4150	[0.50]	Wildlife Conservation and Management	ENVS*3150	[0.50]	Aquatic Systems
ENVB*2010	[0.50]	Food Production and the Environment	ENVS*3160	[0.50]	Atmospheric Systems
ENVB*2030	[0.50]	Current Issues in Forest Science	0.50 electives or	restricted ele	ectives
ENVB*2040	[0.50]	Plant Health and the Environment	Semester 7		
ENVB*3010	[0.50]	Climate Change Biology	ECON*3710	[0.50]	Advanced Microeconomics
ENVB*3030	[0.50]	Pesticides and the Environment	ECON*4930	[0.50]	Environmental Economics
ENVB*3040	[0.50]	Natural Chemicals in the Environment	ENVS*4011	[0.00]	Project in Environmental Sciences
ENVB*3250	[0.50]	Forest Health and Disease	ENVS*4300	[0.50]	Environmental Law & Regulation
ENVB*3300	[0.50]	Applied Ecology and Environment	1.00 electives or	restricted ele	ectives
ENVB*4020 ENVB*4130	[0.50]	Chemical Ecology: Principles & Practice *	Note: Students m	ust obtain p	ermission from instructor to take ECON*4930 and
ENVB*4130 ENVB*4240	[0.50]	Biological Activity of Pesticides	ECON*3/10 at th	he same time	2.
ENVB*4550	[0.50]	Ecotoxicological Risk Characterization *	Semester 8		
ENVB*4780	[0.50]	Forest Ecology *	AGEC*4310	[0.50]	Resource Economics
ENVS*4220	[0.50]	Environmental Impact Assessment	ENVS*4012	[0.50]	Project in Environmental Sciences
GEOG*3020	[0.50]	Global Environmental Change	1.50 restricted ele	ectives or ele	ectives
GEOL*3190	[0.50]	Environmental Water Chemistry	Restricted Lie	cuves	
MICR*4140	[0.50]	Soil Microbiology and Biotechnology	Students in the E	nvironmenta	al Economics and Policy major are required to choose 2.00
MICR*4180	[0.50]	Microbial Processes in Environmental Management	Economics (ECO	I FUOU, Ag	Students are encouraged to seek advice on their choices and
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants *	are reminded that	t 6.00 credit	s of their B Sc (Env.) degree must be at the 3000 level or
SOIL*2120	[0.50]	Soil and Water Conservation *	higher.		o i mon b.oc.(Env.) degree must be at the 5000 level of
TOX*3360	[0.50]	Finite Source Conservation **	<b>En-</b>	tol Farra	miss and Dollar (EED-C)
ZOO*4350	[0.50]	Biology of Polluted Waters *	Environment	iai Econo	mics and Policy (EEP:C)
* Note: Students	should note	that some restricted electives (marked by asterisks *) require	Department of <b>F</b>	Economics,	College of Management and Economics
other restricted	electives a	s prerequisites. Students should consult the most recent	Department of H	Food, Agric	ultural and Resource Economics, Ontario Agricultural
undergraduate ca	alendar for s	specific requirements.	College		

### **Environmental Economics and Policy (EEP)**

### Department of Economics, College of Management and Economics

Department of Food, Agricultural and Resource Economics, Ontario Agricultural College

#### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

### Semester 1 - Fall

Major

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences

- U U	, ,				
MATH*1080	[0.50]	Elements of Calculus I	MATH*1080	[0.50]	Elements of Calculus I
Semester 2 -	[0.50] Winter	Physics for Life Sciences	Semester 2	[0.50]	Physics for Life Sciences
DIOI *1040	10 501	Dielery II	DIOL *1040	[0 50]	Dielery II
CHEM*1050	[0.50]	Diology II General Chemistry II	CHEM*1040	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education	ECON*1050	[0.50]	Introductory Microeconomics
ECON*1050	[0.50]	Introduction to Co operative Education	GEOG*1300	[0.50]	Introductory whereeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment	PHYS*1130	[0.50]	Physics with Applications
PHYS*1130	[0.50]	Physics with Applications	Semester 3	. ,	<b>5</b> 11
Semester 3 -	Fall		ENVS*2150	[0,50]	Terrestrial Systems
AGEC*2700	[0.50]	Survey of Natural Resource Economics	GEOG*2000	[0.50]	Geomorphology
ECON*1100	[0.50]	Introductory Macroeconomics	GEOG*2460	[0.50]	Analysis in Geography
ECON*2100	[0.50]	Economic Growth and Environmental Quality	One of:		
ENVS*2150	[0.50]	Terrestrial Systems	AGEC*2700	[0.50]	Survey of Natural Resource Economics
0.50 electives of	or restricted ele	ectives	ECON*2100	[0.50]	Economic Growth and Environmental Quality
Winter Semo	ester		0.50 electives		
COOP*1000	[0.00]	Co-op Work Term I	Semester 4		
Semester 4 -	Summer		BIOL*2060	[0.50]	Ecology
BIOL*2060	[0.50]	Ecology	GEOG*2110	[0.50]	Climate and the Biophysical Environment
ECON*2310	[0.50]	Intermediate Microeconomics	GEOG*2210	[0.50]	Environment and Resources
ECON*2410	[0.50]	Intermediate Macroeconomics	0.50 electives	[0.50]	Mapping and GIS
PHIL*2070	[0.50]	Philosophy of the Environment	Somester 5		
STAT*2040	[0.50]	Statistics I	CEOC*2110	FO 501	Disting and Matural Deservation
Note: STAT*2	040 may be su	Distituted for ECON*2740.	GEOG*3110 GEOG*3210	[0.50]	Biotic and Natural Resources
Fail Semeste	1		POL \$*3370	[0.50]	Environmental Policy Formation and Administration
COOP*2000	[0.00]	Co-op Work Term II	1.00 electives or 1	restricted ele	ctives*
Semester 5 -	Winter		Note: Environme	ntal Geograp	by majors are required to complete GEOG*3210 and
AGEC*3170	[0.50]	Cost-Benefit Analysis	(POLS*3370 or Z	200*4050).	ZOO*4050 may be substituted for POLS*3370 and would
ECON*27/0	[0.50]	Introductory Mathematical Economics	be taken in Semes	ster 8.	
ENVS*3150	[0.50]	Aquatic Systems	Semester 6		
One of:	[0.50]	Atmospheric Systems	ENVS*3150	[0.50]	Aquatic Systems
GEOG*321	0 [0.50]	Management of the Biophysical Environment	ENVS*3160	[0.50]	Atmospheric Systems
POLS*3370	[0.50]	Environmental Policy Formation and Administration	GEOG*3480	[0.50]	GIS and Spatial Analysis
Note: ZOO*40	50 may be subs	stituted for GEOG*3210 or POLS*3370 and would be taken	PHIL*2070	[0.50]	Philosophy of the Environment
in Semester 7.			0.50 electives or 1	restricted ele	ctives*
Summer Sen	nester		Semester 7		
COOP*3000	[0.00]	Co-op Work Term III	ENVS*4011	[0.00]	Project in Environmental Sciences
Semester 6 -	Fall		ENVS*4300	[0.50]	Environmental Law & Regulation
AGEC*3190	[0.50]	Markets, Firms & Natural Amenities	1 00 electives	[1.00] or restricted	electives*
AGEC*4290	[0.50]	Land Economics	OR	or restricted	electives
ECON*3710	[0.50]	Advanced Microeconomics	ENVS*4011	[0.0]	Project in Environmental Sciences
ENVS*4011	[0.00]	Project in Environmental Sciences	ENVS*4300	[0.50]	Environmental Law & Regulation
1.00 electives of	or restricted ele	ectives	0.50 credits in	Geography a	at the 3000 level or higher
Note: AGEC*4	4290 is taught :	in even-numbered years.	1.50 electives of	or restricted	electives*
Semester / -	winter		Semester 8		
AGEC*4310	[0.50]	Resource Economics	ENVS*4012	[0.50]	Project in Environmental Sciences
ECON*3/40 ENIVS*4012	[0.50]	Introduction to Econometrics	GEOG*4880	[0.50]	Contemporary Geographic Thought
1.50 electives (	[U.JU] or restricted ele	Project in Environmental Sciences	1.50 electives or 1	restricted ele	ctives*
Summer Sen	nester (Onti	anal)	* students in the E	invironmenta	l Geography major must take at least 4 additional geography
COOP*4000	[0 00]	Co-on Work Term IV	courses at the 300	JU level or hi	gner including:
Semester 8 -	[0.00] Fall	co-op work remitiv	At least one of:	[0,50]	
ECON*4020	1 an		GEOG*3000 GEOG*2610	[0.50]	Fluvial Processes
ECUN*4930 ENVS*/300	[0.50]	Environmental Law & Regulation	GEOG*3620	[0.50]	Desert Environments
1 50 electives	or restricted ele	Environnientai Law & Regulation	At least two of	[0.50]	Desert Environments
Restricted F	lectives		ENVS*4220	[0.50]	Environmental Impact Assessment
Students in the	Environmant-	I Economics and Policy major are required to shoose 2.00	GEOG*3020	[0.50]	Global Environmental Change
credits additio	nal Food Ac	ricultural and Resource Economics (AGEC*XXXX) or	GEOG*4110	[0.50]	Environmental Systems Analysis
Economics (EC	CON*XXXX).	Students are encouraged to seek advice on their choices and	GEOG*4210	[0.50]	Environmental Governance
are reminded t	hat 6.00 credit	s of their B.Sc.(Env.) degree must be at the 3000 level or	Environment	tal Geogra	aphy (ENVG:C)
higher.			Department of G	eogranhy	College of Social and Applied Human Sciences

Major

Semester 1 - Fall

BIOL\*1030

CHEM\*1040

ENVS\*1020

MATH\*1080

PHYS\*1080

### **Environmental Geography (ENVG)**

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

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

#### Semester 1

Last Revision: January 28, 2008

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences

2007-2008 University of Guelph Undergraduate Calendar

Introduction to Environmental Sciences

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are strongly encouraged to seek advice from the appropriate advisor when

selecting and scheduling courses, before Semester 3.

Biology I

General Chemistry I

Elements of Calculus I

Physics for Life Sciences

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

Semester 2 - Wi	inter	
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
Somester 3 - Fa	[0.30] <b>II</b>	Physics with Applications
ENVS*2150	IO 501	Torrotrial Systems
GEOG*2000	[0.50]	Geomorphology
GEOG*2460	[0.50]	Analysis in Geography
One of:	[0.00]	
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
0.50 electives		
Winter Semeste	er	
COOP*1000	[0.00]	Co-op Work Term I
Semester 4 - Su	mmer	
BIOL*2060	[0.50]	Ecology
GEOG*2210	[0.50]	Environment and Resources
PHIL*2070	[0.50]	Philosophy of the Environment
1.00 electives		
Fall Semester		
COOP*2000	[0.00]	Co-op Work Term II
Semester 5 - Wi	inter	
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
GEOG*2110 GEOG*2480	[0.50]	Climate and the Biophysical Environment
0.50 electives or re	estricted ele	rectives*
Summer Semes	ter	
COOP*3000	[0 00]	Co-on Work Term III
Semester 6 - Fa	[0.00] ]]	
ENVS*4011	[0.00]	Project in Environmental Sciences
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis
POLS*3370	[0.50]	Environmental Policy Formation and Administration
0.50 electives or re	estricted ele	octives*
(POI \$*3370 or 70	$\Omega \Omega * 4050$	700*4050 may be substituted for POL S*3370 and would
be taken in Semest	ter 8.	200 4050 may be substituted for 1 OLS 5570 and would
Semester 7 - Wi	inter	
ENVS*4012	[0.50]	Project in Environmental Sciences
GEOG*4880	[0.50]	Contemporary Geographic Thought
1.50 electives or re	estricted ele	ectives*
Summer Semes	ter	
COOP*4000	[0.00]	Co-op Work Term IV
Semester 8 - Fa	11	
ENVS*4300	[0.50]	Environmental Law & Regulation
GEOG*4690	[1.00]	Geography Field Research
1.00 electives o	r restricted	electives*
OK ENVE*4200	IO <b>5</b> 01	Environmental Levy & Deculation
0.50 credits in (	[0.50] Geography	at the 3000 level or higher
1.50 electives o	r restricted	electives*
* students in the Er	vironmenta	l Geography major must take at least 4 additional geography
courses at the 3000	0 level or h	igher including:
At least one of:		
GEOG*3000	[0.50]	Fluvial Processes
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*3620	[0.50]	Desert Environments
At least two of:	[0 <b>5</b> 0]	Environmental Impact Assessment
EIN V 5*4220 GEOC*2020	[0.50] [0.50]	Clobal Environmental Change
GEOG*4110	[0.50]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Governance

### **Environmental Monitoring and Analysis (EMA)**

College of Physical and Engineering Science

### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

	Semester 1		
	BIOL*1030	[0.50]	Biology I
	CHEM*1040	[0.50]	General Chemistry I
	ENVS*1020	[0.50]	Introduction to Environmental Sciences
	MATH*1080	[0.50]	Elements of Calculus I
	PHYS*1080	[0.50]	Physics for Life Sciences
	Semester 2		
	BIOL*1040	[0.50]	Biology II
	CHEM*1050	[0.50]	General Chemistry II
	ECON*1050	[0.50]	Introductory Microeconomics
	GEOG*1300	[0.50]	Introduction to the Biophysical Environment
	PHYS*1130	[0.50]	Physics with Applications
	Semester 3		
	CHEM*2300	[0.50]	Chemical Reactivity
	ENVS*2150	[0.50]	Terrestrial Systems
	MATH*2080	[0.50]	Elements of Calculus II
	MET*2030	[0.50]	Meteorology and Climatology
	ACEC*2700	[0 50]	Survey of Netural Resource Feanomies
	FCON*2100	[0.50]	Economic Growth and Environmental Quality
	Semester 4	[0.50]	Economic Growth and Environmental Quanty
	DIOC*2590	[0.50]	Interductory Dischamistry
	CHEM*2480	[0.50]	Analytical Chemistry I
	PHYS*2040	[0.50]	Fundamental Electronics and Sensors
	STAT*2040	[0.50]	Statistics I
	One of:	[0.50]	Statistics I
	CIS*1200	[0.50]	Introduction to Computing
	CIS*1500	[0.50]	Introduction to Programming
	Semester 5		
	BIOL*2060	[0.50]	Ecology
	PHYS*2550	[0.50]	Radiation and the Environment
	STAT*2050	[0.50]	Statistics II
	TOX*2000	[0.50]	Principles of Toxicology
	One of:		
	GEOG*3210	[0.50]	Management of the Biophysical Environment
	POLS*3370	[0.50]	Environmental Policy Formation and Administration
ould	Note: PH 1 5*2550	18 offered 1	in even numbered years.
	in Semester 8 - Wi	nter	lituted for GEOG <sup>+</sup> 5210 of 1 OES <sup>+</sup> 5570 and would be taken
	Semester 6	inter.	
	CHEM*3360	[0 50]	Environmental Chemistry and Toxicology
	ENVS*3150	[0.50]	Aquatic Systems
	ENVS*3160	[0.50]	Atmospheric Systems
	PHIL*2070	[0.50]	Philosophy of the Environment
	STAT*3510	[0.50]	Environmental Risk Assessment
	Semester 7		
	ENVS*4011	[0.00]	Project in Environmental Sciences
	ENVS*4300	[0.50]	Environmental Law & Regulation
	TOX*3300	[0.50]	Analytical Toxicology
	1.00 core requirem	ent or elect	ives
	Semester 8		
	CHEM*4010	[0.50]	Chemistry and Industry
aphy	ENVS*4012	[0.50]	Project in Environmental Sciences
	PHYS*3080	[0.50]	Energy
	One of:	FO =07	
	MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
	ME1*4300	[0.50]	Atmospheric Transport and Chemistry
	Note: MET*/3003	is offered in	even numbered years
	Environmente		aving and Analyzig (EMA (C))

Environmental Monitoring and Analysis (EMA:C)

College of Physical and Engineering Science

#### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

### Semester 1 - Fall BIOL\*1030 [0.

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I

	Winton	
Note: ZOO*405	0 may be sub	stituted for GEOG*3210 or POLS*3370 and would be taken
POLS*3370	[0.50]	Environmental Policy Formation and Administration
GEOG*3210	[0 50]	Management of the Biophysical Environment
TOX*3300	[0.50]	Analytical Toxicology
ENVS*4300	[0.50]	Environmental Law & Regulation
Semester 8		
COOP*4000	[0.00]	Co-op Work Term IV
Summer Sem	ester (Opti	onal)
Note: MET*430	00 is offered i	n even numbered years.
0.50 electives		
MET*4300	[0.50]	Atmospheric Transport and Chemistry
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
One of:		
STAT*3510	[0.50]	Environmental Risk Assessment
PHYS*3080	[0.50]	Energy
ENVS*4012	[0.50]	Project in Environmental Sciences
CHEM*4010	[0.50]	Chemistry and Industry
Semester 7 - V	Winter	
Note: PHYS*25	550 is offered	in even numbered years.
0.50 electives	[]	······································
ECON*2100	[0.50]	Economic Growth and Environmental Quality
AGEC*2700	[0.50]	Survey of Natural Resource Economics
One of	[0.50]	rinciples of roxicology
PHYS*2550 TOX*2000	[0.50]	Radiation and the Environment
PHYS*2040 DHVS*2550	[0.50]	Fundamental Electronics and Sensors
ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4011	[0 00]	Project in Environmental Sciences
Semester 6 - 1	[0.00] Fall	
COOP*3000	[0.00]	Co-op Work Term III
Summer Sem	ester	
STAT*2050	[0.50]	Statistics II
PHYS*2040	[0.50]	Fundamental Electronics and Sensors
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
ENVS*3160	[0.50]	Atmospheric Systems
ENVS*3150	[0.50]	Aquatic Systems
Semester 5 - V	Winter	
COOP*2000	[0.00]	Co-op Work Term II
Fall Semester	•	
STAT*2040	[0.50]	Statistics I
PHIL*2070	[0.50]	Philosophy of the Environment
CHEM*2480	[0.50]	Analytical Chemistry I Philosophy of the Environment
BIOL*2060	[0.50]	Ecology
BIOU*2580	[0.50]	Introductory Biochemistry
BIOC*2590	[0 50]	Introductory Biochamistry
Semester 4 - S	Summer	· · · <b>r</b> . · · · · · · · · · · · · · · · · · · ·
COOP*1000	[0.00]	Co-op Work Term I
Winter Semes	ster	
CIS*1500	[0.50]	Introduction to Programming
CIS*1200	[0.50]	Introduction to Computing
One of:	[0.00]	Little Store S, and Children S,
MET*2030	[0.50]	Meteorology and Climatology
ENVS*2130 MATH*2080	[0.50]	Flements of Calculus II
CHEM*2300	[0.50]	Chemical Reactivity
Semester 3 - 1	ran	
Somestor 3	[0.30] Fall	Physics with Applications
GEUG*1500 DHVS*1130	[0.50]	Physics with Applications
ECON*1050	[0.50]	Introductory Microeconomics
COOP*1100	[0.00]	Introduction to Co-operative Education
CHEM*1050	[0.50]	General Chemistry II
BIOL*1040	[0.50]	Biology II
Semester 2 - V	winter	
Fri S*1080	[0.30]	Physics for Life Sciences
MAIH*1080	[0.50]	Elements of Calculus I
ENVS*1020	[0.50]	Elements of Columbus L

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

### Major

STAT\*3110

[0.50]

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

and scheduling co	urses.	
Semester 1		
BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2		
BIOI *10/0	[0 50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Semester 3	[0.50]	r nysies with rippleutons
CIS*1500	IO 501	Introduction to Decomposing
CIS*1500 ENVS*2150	[0.50]	Torrestrial Systems
STAT*2040	[0.50]	Statistics I
One of:	[0.50]	Statistics I
MATH*2080	[0 50]	Elements of Calculus II
MATH*2160	[0.50]	Linear Algebra I
One of:	[0.50]	Elitear Aigeora i
AGEC*2700	[0 50]	Survey of Natural Resource Economics
FCON*2100	[0.50]	Economic Growth and Environmental Quality
Note: Only one of l	[0.50] MATH*121	0/MATH*2080 and only one of MATH*2150/MATH*2160
will count towards	the degree	(see Semester 4) MATH*1210 and MATH*2160 are
preferred for math	ematics em	nhasis
Note: Students in t	he Environn	plasis.
and Modelling Fac	ulty Advis	or for course scheduling in semester 4 through 8
Semester 4	July Havis	or for course seneduning in semester 7 through 6.
DIOL *2000	FO 501	
BIOL*2060	[0.50]	Ecology
MATH*2150	[0.50]	Numerical Methods
MATH*2170	[0.50]	Statistics H
STAT*2050	[0.50]	Statistics II
MATU*1210	IO <b>5</b> 01	Coloulus II
MATH*1210	[0.50]	Calculus II
Somestor 5	[0.50]	Applied Matrix Algebra
Semester 5		
One of:	50 503	
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
2.00 electives or re	estricted ele	ctives
Note: 200*4050	may be subs	stituted for GEOG*3210 or POLS*3370 and would be taken
in Semester 8.		
Semester 6		
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
MATH*3510	[0.50]	Biomathematics
PHIL*2070	[0.50]	Philosophy of the Environment
STAT*3510	[0.50]	Environmental Risk Assessment
Semester 7		
ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation
2.00 electives or re	estricted ele	ctives
Semester 8		
ENIVE*4012	IO 501	Device tin Environmental Sciences
EIN V 5**4012	[U.SU]	Project in Environmental Sciences
2.00 electives of R		cenves
Restricted Liec	uves	
Students in the Er	ivironmetri	cs major are required to choose 3.50 credits of restricted
electives. A minim	um of 2.50	credits must be at the 3000 level or higher and a minimum
of 1.00 must be at	the 4000 le	vel.
List		
MATH*2200	[0.50]	Advanced Calculus I
MATH*2210	[0.50]	Advanced Calculus II
MATH*3100	[0.50]	Differential Equations II
MATH*3170	[0.50]	Partial Differential Equations and Special Functions
MATH*3240	[0.50]	Operations Research
MATH*4070	[0.50]	Case Studies in Modeling
MATH*4430	[0.50]	Advanced Numerical Methods
MATH*4510	[0.50]	Environmental Transport and Dynamics
STAT*3100	[0.50]	Introductory Mathematical Statistics I
		-

2007-2008 University of Guelph Undergraduate Calendar

Introductory Mathematical Statistics II

STAT*3240	[0.50]	Applied Regression Analysis
STAT*3320	[0.50]	Sampling Theory with Applications
STAT*4510	[0.50]	Advanced Risk Analysis
STAT*4340	[0.50]	Statistical Inference
STAT*4350	[0.50]	Applied Multivariate Statistical Methods
STAT*4360	[0.50]	Applied Time Series Analysis
CIS*1900	[0.50]	Discrete Structures in Computer Science
CIS*2430	[0.50]	Object Oriented Programming
CIS*2460	[0.50]	Modelling of Computer Systems
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration
CIS*3460	[0.50]	System Simulation
CIS*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts

#### **Environmetrics and Modelling (EMM:C)**

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

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

#### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

#### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I		
CHEM*1040	[0.50]	General Chemistry I		
ENVS*1020	[0.50]	Introduction to Environmental Sciences		
MATH*1080	[0.50]	Elements of Calculus I		
PHYS*1080	[0.50]	Physics for Life Sciences		
Semester 2 - V	Vinter			
BIOL*1040	[0.50]	Biology II		
CHEM*1050	[0.50]	General Chemistry II		
COOP*1100	[0.00]	Introduction to Co-operative Education		
ECON*1050	[0.50]	Introductory Microeconomics		
GEOG*1300	[0.50]	Introduction to the Biophysical Environment		
PHYS*1130	[0.50]	Physics with Applications		
Semester 3 - Fall				
CIS*1500	[0.50]	Introduction to Programming		
ENVS*2150	[0.50]	Terrestrial Systems		
MATH*2080	[0.50]	Elements of Calculus II		
STAT*2040	[0.50]	Statistics I		
0.50 electives or restricted electives				

Note: Students in the Environmetrics and Modelling major must consult the Environmetrics and Modelling Faculty Advisor for course scheduling in semester 4 through 8.

Winter Semester 100.001

COOP*1000	[0.00]	Co-op Work Term I		
Semester 4 - Summer				
BIOL*2060	[0.50]	Ecology		
MATH*2130	[0.50]	Numerical Methods		
MATH*2150	[0.50]	Applied Matrix Algebra		
MATH*2170	[0.50]	Differential Equations I		
PHIL*2070	[0.50]	Philosophy of the Environment		
Fall Semester				
COOP*2000	[0.00]	Co-op Work Term II		
Semester 5 - Wi	inter	-		
ENVS*3150	[0.50]	Aquatic Systems		
ENVS*3160	[0.50]	Atmospheric Systems		
STAT*2050	[0.50]	Statistics II		
1.00 electives or re	estricted ele	ctives		
Summer Semester				
COOP*3000	[0.00]	Co-op Work Term III		
Semester 6 - Fa	11	-		
ENVS*4011	[0.00]	Project in Environmental Sciences		
One of:		-		
AGEC*2700	[0.50]	Survey of Natural Resource Economics		
ECON*2100	[0.50]	Economic Growth and Environmental Quality		
One of:				
GEOG*3210	[0.50]	Management of the Biophysical Environment		
POLS*3370	[0.50]	Environmental Policy Formation and Administration		
1.50 electives or re	estricted ele	ctives		
Note: ZOO*40501	nay be subs	tituted for GEOG*3210 or POLS*3370 and would be taken		
in Semester 7.				

Semester 7 - Winter				
ENVS*4012	[0.50]	Project in Environmental Sciences		
MATH*3510	[0.50]	Biomathematics		
STAT*3510	[0.50]	Environmental Risk Assessment		
1.00 electives or	restricted e	lectives		
Summer Sem	ester (Opt	ional)		
COOP*4000	[0.00]	Co-op Work Term IV		
Semester 8 - H	all			
ENVS*4300	[0.50]	Environmental Law & Regulation		
2.00 electives or	restricted e	lectives		
Restricted Electives				
Students in the Environmetrics major are required to choose 3.50 credits of restricted electives. A minimum of 2.50 credits must be at the 3000 level or higher and of these a minimum of 1.00 must be at the 4000 level.				
List				
MATH*2200	[0.50]	Advanced Calculus I		
MATH*2210	[0.50]	Advanced Calculus II		
MATH*3100	[0.50]	Differential Equations II		
MATH*3170	[0.50]	Partial Differential Equations and Special Functions		
MATH*3240	[0.50]	Operations Research		

MITTI 5100	[0.50]	Differential Equations II
MATH*3170	[0.50]	Partial Differential Equations and Special Functions
MATH*3240	[0.50]	Operations Research
MATH*4070	[0.50]	Case Studies in Modeling
MATH*4430	[0.50]	Advanced Numerical Methods
MATH*4510	[0.50]	Environmental Transport and Dynamics
STAT*3100	[0.50]	Introductory Mathematical Statistics I
STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3240	[0.50]	Applied Regression Analysis
STAT*3320	[0.50]	Sampling Theory with Applications
STAT*4510	[0.50]	Advanced Risk Analysis
STAT*4340	[0.50]	Statistical Inference
STAT*4350	[0.50]	Applied Multivariate Statistical Methods
STAT*4360	[0.50]	Applied Time Series Analysis
CIS*1900	[0.50]	Discrete Structures in Computer Science
CIS*2430	[0.50]	Object Oriented Programming
CIS*2460	[0.50]	Modelling of Computer Systems
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration
CIS*3460	[0.50]	System Simulation
CIS*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts

### Natural Resources Management (NRM)

Somestan 1

### Department of Land Resource Science, Ontario Agricultural College Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

In this major there are fees charged to cover partial costs of some field trips. Students in need of financial assistance should approach the Chair of the department offering the course.

Semester 1		
BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
Semester 2		
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications
Semester 3		
ENVS*2150	[0.50]	Terrestrial Systems
MET*2030	[0.50]	Meteorology and Climatology
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
STAT*2040	[0.50]	Statistics I
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
Note: GEOG*246	0 may be su	ubstituted for STAT*2040.
Semester 4		
BIOL*2060	[0.50]	Ecology
PHIL*2070	[0.50]	Philosophy of the Environment

SOIL*2010	[0.50]	Soil Science	
1.00 electives or re	1.00 electives or restricted electives		
Semester 5			
ENVB*2030	[0.50]	Current Issues in Forest Science	
SOIL*3050	[0.50]	Land Utilization	
SOIL*3080	[0.50]	Soil and Water Conservation	
One of:			
GEOG*3210	[0.50]	Management of the Biophysical Environment	
POLS*3370	[0.50]	Environmental Policy Formation and Administration	
0.50 electives or re	stricted ele	ctives	
Note: ZOO*4050 1	nay be subs	tituted for GEOG*3210 or POLS*3370 and would be taken	
in Semester 8.			
Semester 6			
ENVS*3150	[0.50]	Aquatic Systems	
ENVS*3160	[0.50]	Atmospheric Systems	
SOIL*3100	[0.50]	Resource Planning Techniques	
One of:			
ENGG*2550	[0.50]	Water Management	
GEOG*3610	[0.50]	Environmental Hydrology	
GEOL*3060	[0.50]	Groundwater	
0.50 electives or restricted electives			
Semester 7			
ENVS*4011	[0.00]	Project in Environmental Sciences	
ENVS*4300	[0.50]	Environmental Law & Regulation	
SOIL*4110	[0.50]	Natural Resources Management Field Camp	
ZOO*4110	[0.50]	Principles of Fish and Wild Life Management	
1.00 electives or re	estricted ele	ctives	
Note: BIOL*4150	may be sub	ostituted for ZOO*4110.	
Semester 8			
ENVS*4012	[0.50]	Project in Environmental Sciences	
2.00 electives or re	stricted ele	ctives	

#### **Restricted Electives**

Students in the Natural Resources Management major are required to choose 1.50 restricted elective credits from the following list. Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000 level or higher.

CROP*2280	[0.50]	Crops in Land Reclamation		
ENVB*3000	[0.50]	Nature Interpretation		
ENVB*4780	[0.50]	Forest Ecology		
ENVS*3320	[0.50]	Principles of Landscape Ecology		
ENVS*4220	[0.50]	Environmental Impact Assessment		
GEOG*2420	[0.50]	Aerial-photo Interpretation		
GEOG*3210	[0.50]	Management of the Biophysical Environment		
GEOG*3480	[0.50]	GIS and Spatial Analysis		
GEOL*3130	[0.50]	Agrogeology		
LARC*4520	[0.50]	Park and Recreation Administration		
MET*3050	[0.50]	Microclimatology		
SOIL*3060	[0.50]	Environmental Soil Chemistry		
SOIL*3070	[0.50]	Environmental Soil Physics		
SOIL*3170	[0.50]	Soil Processes in Landscape		
SOIL*3200	[0.50]	Environmental Soil Biology		
SOIL*3600	[0.50]	Remote Sensing		
Natural Resources Management (NRM:C)				

### Department of Land Resource Science, Ontario Agricultural College Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

In this major there are fees charged to cover partial costs of some field trips. Students in need of financial assistance should approach the Chair of the department offering the course.

#### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I	GEOG*2420	[0.50
CHEM*1040	[0.50]	General Chemistry I	GEOG*3210	[0.50
ENVS*1020	[0.50]	Introduction to Environmental Sciences	GEOG*3480	[0.50
MATH*1080	[0.50]	Elements of Calculus I	GEOL*3130	[0.50
PHYS*1080	[0.50]	Physics for Life Sciences	LARC*4520	[0.50
Semester 2 - Winter			MET*3050	[0.50
BIOL*1040 CHEM*1050 COOP*1100 ECON*1050 GEOG*1300	[0.50] [0.50] [0.00] [0.50] [0.50]	Biology II General Chemistry II Introduction to Co-operative Education Introductory Microeconomics Introduction to the Biophysical Environment	SOIL*3060 SOIL*3070 SOIL*3170 SOIL*3200 SOIL*3600	[0.50 [0.50 [0.50 [0.50 [0.50
		1 5		

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PHYS\*1130 [0.50] Physics with Applications Semester 3 - Fall ENVB\*2030 [0.50] Current Issues in Forest Science ENVS\*2150 [0.50] Terrestrial Systems MET\*2030 Meteorology and Climatology [0.50] SOIL\*2120 [0.50] Introduction to Environmental Stewardship STAT\*2040 [0.50] Statistics I Note: GEOG\*2460 may be substituted for STAT\*2040. Winter Semester COOP\*1000 [0.00] Co-op Work Term I Semester 4 - Summer BIOL\*2060 [0.50] Ecology PHIL\*2070 [0.50] Philosophy of the Environment 1.50 electives or restricted electives **Fall Semester** COOP\*2000 Co-op Work Term II [0.00] Semester 5 - Winter ENVS\*3150 [0.50]Aquatic Systems ENVS\*3160 Atmospheric Systems [0.50] SOIL\*2010 [0.50] Soil Science One of: ENGG\*2550 [0.50] Water Management GEOG\*3610 Environmental Hydrology [0.50]GEOL\*3060 [0.50] Groundwater 0.50 electives or restricted electives Summer Semester COOP\*3000 [0.00] Co-op Work Term III Semester 6 - Fall ENVS\*4011 [0.00]Project in Environmental Sciences SOIL\*3050 [0.50] Land Utilization SOIL\*3080 [0.50] Soil and Water Conservation One of: AGEC\*2700 [0.50] Survey of Natural Resource Economics ECON\*2100 [0.50] Economic Growth and Environmental Quality One of: GEOG\*3210 [0.50] Management of the Biophysical Environment POLS\*3370 [0.50] Environmental Policy Formation and Administration 0.50 electives or restricted electives Note: ZOO\*4050 may be substituted for GEOG\*3210 or POLS\*3370 and would be taken in Semester 7. Semester 7 - Winter ENVS\*4012 [0.50]Project in Environmental Sciences SOIL\*3100 [0.50] Resource Planning Techniques 1.50 electives or restricted electives Summer Semester (Optional) COOP\*4000 [0.00]Co-op Work Term IV Semester 8 - Fall ENVS\*4300 [0.50] Environmental Law & Regulation SOIL\*4110 [0.50] Natural Resources Management Field Camp Principles of Fish and Wild Life Management ZOO\*4110 [0.50] 1.00 electives or restricted electives Note: BIOL\*4150 may be substituted for ZOO\*4110. **Restricted Electives** Students in the Natural Resources Management major are required to choose 1.50 restricted elective credits from the following list. Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000 level or higher. CROP\*2280 [0.50]Crops in Land Reclamation EN ΕN

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VB*3000	[0.50]	Nature Interpretation
VB*4780	[0.50]	Forest Ecology
VS*3320	[0.50]	Principles of Landscape Ecology
VS*4220	[0.50]	Environmental Impact Assessment
EOG*2420	[0.50]	Aerial-photo Interpretation
EOG*3210	[0.50]	Management of the Biophysical Environment
EOG*3480	[0.50]	GIS and Spatial Analysis
EOL*3130	[0.50]	Agrogeology
RC*4520	[0.50]	Park and Recreation Administration
ET*3050	[0.50]	Microclimatology
IL*3060	[0.50]	Environmental Soil Chemistry
IL*3070	[0.50]	Environmental Soil Physics
IL*3170	[0.50]	Soil Processes in Landscape
IL*3200	[0.50]	Environmental Soil Biology
IL*3600	[0.50]	Remote Sensing