

## The College at Brockport: State University of New York Digital Commons @Brockport

---

College Senate Resolutions

---

4-7-2008

# Aquatic and Terrestrial Ecology and Biology Tracks in Environmental Science

The College at Brockport, College Senate

Follow this and additional works at: [https://digitalcommons.brockport.edu/senate\\_resolutions](https://digitalcommons.brockport.edu/senate_resolutions)

Part of the [Higher Education Commons](#)

---

### Repository Citation

The College at Brockport, College Senate, "Aquatic and Terrestrial Ecology and Biology Tracks in Environmental Science" (2008).  
*College Senate Resolutions*. 1398.

[https://digitalcommons.brockport.edu/senate\\_resolutions/1398](https://digitalcommons.brockport.edu/senate_resolutions/1398)

This Resolution is brought to you for free and open access by Digital Commons @Brockport. It has been accepted for inclusion in College Senate Resolutions by an authorized administrator of Digital Commons @Brockport. For more information, please contact [kmyers@brockport.edu](mailto:kmyers@brockport.edu), [digitalcommons@brockport.edu](mailto:digitalcommons@brockport.edu).

# SUNY BROCKPORT

College Senate  
State University of New York College at Brockport  
350 New Campus Drive  
Brockport, NY 14420-2925  
(585) 395-2586 (Fax) 395-2246

Resolution # 19

2007-2008

## COLLEGE SENATE


New Resolution:   
Supersedes Res #: \_\_\_\_\_

TO: Dr. John R. Halstead, College President

FROM: The College Senate: *April 7, 2008*

- RE:  $\longrightarrow$
- I. Formal Resolution (*Act of Determination*)
  - II. Recommendation (*Urging the Fitness of*)
  - III. Other, For Your Information (*Notice, Request, Report, etc.*)

SUBJ: ***Aquatic and Terrestrial Ecology and Biology Tracks in Environmental Science*** routing #20 07-08 UC


Signed:  Date: \_\_\_\_\_  
*11 / APR / 08*  
 (P. Gibson Ralph, 2007-2008 College Senate President)

**Please fill out the bottom portion and follow the distribution instructions at the end of this page.**

TO: P. Gibson Ralph, The College Senate President

FROM: **John R. Halstead, College President**

- RE:  $\longrightarrow$
- I. Decision and Action Taken on Formal Resolution (circle choice)
    - a. Accepted  
Implementation Effective Date: Fall 2008
    - b. Deferred for discussion with the Faculty Senate on \_\_\_/\_\_\_/\_\_\_
    - c. Unacceptable for the reasons contained in the attached explanation
  - II, III. Response to Recommendation or Other/FYI
    - a. Received and acknowledged \_\_\_/\_\_\_/\_\_\_
    - b. Comment: \_\_\_\_\_

Signed:  Date: 4/22/08  
 (Dr. John R. Halstead, President, SUNY College at Brockport)

### DISTRIBUTION

PRESIDENT'S OFFICE COPIES: Provost, Vice Presidents, College Senate, Other: 4/28/08

PROVOST & VICE PRESIDENT(S) COPIES: Assistant Provost, Dean(s), Academic Advisement, Registrar,  
Other: \_\_\_\_\_

DEAN(S) COPY: Department Chair(s), Other: \_\_\_\_\_

COLLEGE SENATE COPIES: Originator, College Senate Website, Other: \_\_\_\_\_

**DEADLINE FOR SUBMISSIONS: FEBRUARY 28**

Incomplete proposals or proposals received after the deadline may not be reviewed until next semester.

**INSTRUCTIONS:**

- Submit only complete proposals.
- Proposals must be prepared individually in Word format using committee guidelines (guidelines online).
- Fill out this cover page for each proposal (available online at [www.brockport.edu/collegesenate](http://www.brockport.edu/collegesenate)).
- Email proposal and this cover page to [senate@brockport.edu](mailto:senate@brockport.edu) and [facprez@brockport.edu](mailto:facprez@brockport.edu).
- All updates must be resubmitted to the Senate office with the original cover page including routing number.
- Questions? Call the Senate office at 395-2586 or the appropriate committee chairperson.

**1. PROPOSAL TITLE:**

Please be somewhat descriptive, for example, *Graduate Probation/Dismissal Proposal* rather than *Graduate Proposal*.

<b>Revision of the Aquatic and Terrestrial Ecology and Biology Tracks in Environmental Science</b>
--

**2. BRIEF DESCRIPTION OF PROPOSAL:**

- |  |
|--|
| <p><b>A. Restructure categories of elective courses in the Aquatic and Terrestrial Ecology/Biology tracks (no change in credit requirements).</b></p> <p><b>B. Create a curriculum for students wishing to pursue both the Aquatic and Terrestrial Ecology/Biology tracks.</b></p> |
|--|

**3. ANTICIPATED DATE OF IMPLEMENTATION:**

<b>Fall 2008</b>
------------------

Enter date this will be effective if passed by the Senate.

**4. SUBMISSION & REVISION DATES: PLEASE PUT A DATE ON ALL UPDATED DOCUMENTS TO AVOID CONFUSION.**

<i>First Submission</i>	<i>Updated on</i>	<i>Updated on</i>	<i>Updated on</i>
February 20, 2008			

RECEIVED AT SENATE OFFICE

**5. SUBMITTED BY: (contact person)**

<i>Name</i>	<i>Department</i>	<i>Phone</i>	<i>Email</i>
James M. Haynes	Env. Sci. & Biology	x-5783	jhaynes@brockport.edu

**6. COMMITTEES TO COPY: (Senate office use only)**

<b>Standing Committee</b>	<b>Forwarded To</b>	<b>Date</b>
<input type="checkbox"/> Enrollment Planning & Policies	Committee	2/20/08
<input type="checkbox"/> Faculty & Professional Staff Policies	Executive Committee	3/10/08
<input type="checkbox"/> General Education & Curriculum Policies	Senate	3/24/08 – vote 4/7/08
<input type="checkbox"/> Graduate Curriculum & Policies	Senate President’s Signature	4/11/08
<input type="checkbox"/> Student Policies	College President’s Signature	4/11/08
XXUndergraduate Curriculum & Policies	To Vice Provost	NA
	Other	

\*(ROUTING NUMBER IS A CHRONOLOGICAL NUMBER SEQUENCE FOLLOWED BY ACADEMIC YEAR AND COMMITTEE INITIALS)

**2a. Side by side comparison of the old and new curriculum for the aquatic ecology/ biology track of the Environmental Science major.**

<b>Change</b>	<b>Old Program Course</b>	<b>Credits</b>	<b>New Program Course</b>	<b>Credits</b>
None	ENV 419, Limnology <sup>a</sup>	3	ENV 419, Limnology <sup>a</sup>	3
None	ENV 421, Limnol. Lab <sup>a</sup>	2	ENV 421, Limnol. Lab <sup>a</sup>	2
1	ENV 423, Pollution Biol.	3	ENV 423, Pollution Biol.	3
1	ENV 436, WQ Analysis	4	ENV 436, WQ Analysis	4
1	ENV 462, Aq. Toxicology	4	ENV 462, Aq. Toxicology	4
2	ENV 483, Aq. Inverts.	4	ENV 483, Aq. Inverts.	4
2	ENV 484, Fish Ecology	3	ENV 484, Fish Ecology	3
2	ENV 490, Fish Tech./ID	2	ENV 490, Fish Tech./ID	2
None (3)	ENV 319, Biol. Oceanog.	3	ENV 319, Biol. Oceanog.	3
None (3)	ENV 437, Biostatistics	3	ENV 437, Biostatistics	3
None (3)	ENV 439, Conserv. Biol.	3	ENV 439, Conserv. Biol.	3
None (3)	ENV 457, Marine Biology	3	ENV 457, Marine Biology	3
None (3)	ENV 464, Aquaculture I	4	ENV 464, Aquaculture I	4
None (3)	ENV 474, Aquaculture II	4	ENV 474, Aquaculture II	4
None (3)	ENV 476, Anim. Ecophys.	3	ENV 476, Anim. Ecophys.	3
None (3)	ENV 488, Env. Analysis	4-6	ENV 488, Env. Analysis	4-6
None (3)	ENV 498, Collab. Res.	1-3	ENV 498, Collab. Res.	1-3
None (3)	ESC 325, Wetlands	3	ESC 325, Wetlands	3
None (3)	ESC 412, Hydrology	4	ESC 412, Hydrology	4
None (3)	ESC 418, Watershed Sci.	3	ESC 418, Watershed Sci.	3
None (3)	ESC 431, Env.GIS Applic.	4	ESC 431, Env.GIS Applic.	4
4			GEL 457, Geochemistry	4
None (3)	GEL 462, Groundwater	4	GEL 462, Groundwater	4
	<b>Total Credits</b>	<b>20</b>		<b>20</b>

<sup>a</sup>Required for aquatic track majors.

**3a. Brief rationale for aquatic track changes.**

- 1) ENV 423, 436 and 462 are currently free electives in the aquatic track. We are proposing to require that future students choose a minimum of one of these three courses as an elective to develop expertise in aquatic pollution studies.
- 2) ENV 483, 484 and 490 are currently free electives in the aquatic track. We are proposing to require that future students choose a minimum of one of the three courses as an elective to develop expertise in aquatic organism biology, ecology and identification.
- 3) These courses will remain as free electives in the aquatic track. After completing at least one course in each of categories 1 & 2 immediately above, students will be free to complete the track with any of the remaining elective courses in Table 2a (minimum of 15 elective credits).
- 4) Course contains many elements relevant to the track.

**2b. Side by side comparison of the old and new curriculum for the terrestrial ecology/biology track of the Environmental Science major.**

<b>Change</b>	<b>Old Program Course</b>	<b>Credits</b>	<b>New Program Course</b>	<b>Credits</b>
1	ENV 400, Plant Divers.	4	ENV 400, Plant Divers.	4
1	ENV 405, Plant Ecology	4	ENV 405, Plant Ecology	4
2	ENV 430, Ornithology	4	ENV 430, Ornithology	4
2	ENV 440, Herpetology	4	ENV 440, Herpetology	4
2	ENV 459, Mammalogy	4	ENV 459, Mammalogy	4
None (3)	ENV 406, Wildlife Ecol.	4	ENV 406, Wildlife Ecol.	4
None (3)	ENV 423, Pollution Biol.	3	ENV 423, Pollution Biol.	3
None (3)	ENV 427, Anim. Behavior	3	ENV 427, Anim. Behavior	3
None (3)	ENV 437, Biostatistics	3	ENV 437, Biostatistics	3
None (3)	ENV 439, Conserv. Biol.	3	ENV 439, Conserv. Biol.	3
None (3)	ENV 444, Ecosyst. Ecol.	3	ENV 444, Ecosyst. Ecol.	3
None (3)	ENV 476, Anim. Ecophys.	3	ENV 476, Anim. Ecophys.	3
None (3)	ENV 477, Field Biology	4	ENV 477, Field Biology	4
None (3)	ENV 488, Env. Analysis	4-6	ENV 488, Env. Analysis	4-6
None (3)	ENV 498, Collab. Res.	3	ENV 498, Collab. Res.	1-3
None (3)	ESC 313, Env. Climatol.	3	ESC 313, Env. Climatol.	3
None (3)	ESC 325, Wetlands	3	ESC 325, Wetlands	3
None (3)	ESC 431, Env.GIS Applic.	4	ESC 431, Env.GIS Applic.	4
None (3)	ESC 455, Soils Science	4	ESC 455, Soils Science	4
4			GEL 457, Geochemistry	4
	<b>Total Credits</b>	<b>20</b>		<b>20</b>

**3b. Brief rationale for terrestrial track changes.**

- 1) ENV 400 and 405 are currently free electives in the terrestrial track. We are proposing to require that future students choose a minimum of one of the two courses as an elective to develop expertise in plant biology, ecology and identification.**
- 2) ENV 430, 440 and 459 are currently free electives in the terrestrial track. We are proposing to require that future students choose a minimum of one of the three courses as an elective to develop expertise in animal biology, ecology and identification.**
- 3) These courses will remain as free electives in the terrestrial track. After completing at least one course in each of categories 1 & 2 immediately above, students will be free to complete the track with any of the remaining elective courses in Table 2b (minimum of 20 credits total).**
- 4) Course contains many elements relevant to the track.**

2c. Side by side comparison of the old and new curriculum for a combined concentration in aquatic and terrestrial ecology/biology in the Environmental Science major.

Change	Old Program Course	Credits	New Program Course	Credits
1	None		<b>ENV 419, Limnology<sup>a</sup></b>	<b>3</b>
1	None		<b>ENV 421, Limnol. Lab<sup>a</sup></b>	<b>2</b>
2	None		ENV 423, Pollution Biol.	<b>3</b>
2	None		ENV 436, WQ Analysis	<b>4</b>
2	None		ENV 462, Aq. Toxicology	<b>4</b>
3	None		ENV 483, Aq. Inverts.	<b>4</b>
3	None		ENV 484, Fish Ecology	<b>3</b>
3	None		ENV 490, Fish Tech./ID	<b>2</b>
4	None		<b>ENV 400, Plant Divers.</b>	<b>4</b>
4	None		<b>ENV 405, Plant Ecology</b>	<b>4</b>
5	None		ENV 430, Ornithology	<b>4</b>
5	None		ENV 440, Herpetology	<b>4</b>
5	None		ENV 459, Mammalogy	<b>4</b>
6	None		ENV 406, Wildlife Ecol.	<b>4</b>
6	None		ENV 423, Pollution Biol.	<b>3</b>
6	None		ENV 427, Anim. Behavior	<b>3</b>
6	None		ENV 437, Biostatistics	<b>3</b>
6	None		ENV 439, Conserv. Biol.	<b>3</b>
6	None		<b>ENV 444, Ecosyst. Ecol.</b>	<b>3</b>
6	None		ENV 457, Marine Biology	<b>3</b>
6	None		ENV 464, Aquaculture I	<b>4</b>
6	None		ENV 474, Aquaculture II	<b>4</b>
6	None		ENV 476, Anim. Ecophys.	<b>4</b>
6	None		ENV 477, Field Biology	<b>4-6</b>
6	None		ENV 488, Env. Analysis	<b>3</b>
6	None		ENV 498, Collab. Res.	<b>1-3</b>
6	None		<b>ESC313, Env. Climatol.</b>	<b>3</b>
6	None		ESC 325, Wetlands	<b>4</b>
6	None		ESC 412, Hydrology	<b>4</b>
6	None		ESC 418, Watershed Sci.	<b>3</b>
6	None		ESC 455, Soils Science	<b>4</b>
6	None		GEL 457, Geochemistry	<b>4</b>
6	None		GEL 462, Groundwater	<b>4</b>
	<b>Total Credits</b>	<b>31</b>		<b>31</b>

3c. Brief rationale for a combined aquatic and terrestrial track.

During the past two years, several students have asked about the possibility of completing both the aquatic and terrestrial concentrations in the Environmental Science major with less than 40 credits. The students' reasons were two-fold: 1) they had an interest in both areas and did not want to specialize in one, and 2) to be prepared for civil service exams in New York and other states (which now ask questions about both aquatic and terrestrial ecology rather than giving separate fish and wildlife exams), students need coursework in both areas. Faculty members who teach in the two tracks believe that the students' request is reasonable.

1) ENV 419 and 421 are the required, foundation courses for the current aquatic

track, and will continue to be required in the combined track.

- 2) ENV 423, 436 and 462 are currently free electives in the aquatic track. Consistent with proposal 2a/3a above, we are proposing to require that future students choose a minimum of one of the three courses as an elective to develop expertise in aquatic pollution studies.
- 3) ENV 483, 484 and 490 are currently free electives in the aquatic track. Consistent with proposal 2a/3a above, we are proposing to require that future students choose a minimum of one of the three courses as an elective to develop expertise in aquatic organism biology, ecology and identification.
- 4) ENV 400 and 405 are currently free electives in the terrestrial track. Consistent with proposal 2b/3b above, we are proposing to require that future students choose a minimum of one of the two courses as an elective to develop expertise in plant biology, ecology and identification.
- 5) ENV 430, 440 and 459 are currently free electives in the terrestrial track. Consistent with proposal 2b/3b above, we are proposing to require that future students choose a minimum of one of the three courses as an elective to develop expertise in animal biology, ecology and identification.
- 6) The remaining courses in the aquatic and terrestrial tracks will remain as free electives in the combined track (Table 2c). After completing the required courses in category 1 immediately above and at least one course in each of categories 2-5 immediately above, students will complete 10-13 additional elective credits to complete the combined track (i.e., a minimum of 31 credits).

4. Description of new courses (see also attached course registration form): None (all courses are currently offered on a two-year cycle).

5. Staffing Issues: None (all courses are currently staffed).

6. Academic administration commentary.

a. Letter of recommendation from the chair—on behalf of the ESB Department and the Environmental Science Board, the chairman of ESB drafted this document. Therefore, he approves its contents, and a separate letter is not needed.

b. See approval from Dean Appelle, School of Letters and Sciences.

7. Resources and facilities that may be needed to implement the program: None

8. This proposal has been approved unanimously by the Department of Environmental Science and Biology and the Environmental Science Advisory Board.

James M. Haynes  
Professor and Chairman, Department of Environmental Science & Biology  
Chairman, Environmental Science Advisory Board

Thomas W. Kallen  
Professor, Department of Chemistry  
Chemistry Track Representative, Environmental Science Advisory Board

Joseph C. Makarewicz

**Distinguished Service Professor, Department of Environmental Science & Biology  
Aquatic Ecology/Biology Track Representative, Environmental Science Advisory Board**

**Mark R. Noll  
Associate Professor and Chairman, Department of the Earth Sciences  
Earth Sciences Track Representative, Environmental Science Advisory Board**

**Christopher J. Norment  
Professor, Department of Environmental Science & Biology  
Terrestrial Ecology/Biology Track Representative, Environmental Science Advisory  
Board**

**Mark D. Norris  
Instructor, Department of Environmental Science & Biology**

**Jacques Rinchar  
Assistant Professor, Department of Environmental Science & Biology**



The Major in Environmental Science  
Department of Environmental Science and Biology

Summary of Requirements

Student: \_\_\_\_\_ SS#: \_\_\_\_\_ Advisor: \_\_\_\_\_

Entry Date: \_\_\_\_\_ Expected Graduation Date: \_\_\_\_\_

<b>Core Courses (or Transfer Equivalent)</b>		<b>Requirement Completed</b>		<u>School</u>
		<u>Date</u>	<u>Course</u>	
ENV 202 Environmental Science (F,S)	4 cr	_____		
ENV 204 Biology of Organisms (S)	4cr	_____		
ENV 303 Ecology (S)	4 cr	_____		
ENV 452 Environ. Law & Regs. (F,S)	3 cr	_____		
ENV 492 Global Environ. Issues (S)	3 cr	_____		
CHM 205 College Chemistry I (F)	4 cr	_____		
CHM 206 College Chemistry II (S)	4 cr	_____		
CHM 303 Analytical Chemistry (S)	4 cr	_____		
GEL 201 Physical Geology (F)	4 cr	_____		
MTH 201 Calculus I (F,S)	4 cr	_____		
Total Required	38 cr			

**Offering Codes**

F = Fall                      S = Spring                      Sm = Summer  
 E = Even years              O = Odd years                      Eo = Every other year              Occ = Occasional

**Notes**

1. Transfer students must complete a minimum of 18 credits of 300/400 level courses at Brockport regardless of the number of credits transferred.
2. Total credits required to earn environmental science degree depends on track chosen.
3. This worksheet is intended to assist students and faculty advisors in the Environmental Science and Biology major. **It has no official status as a transcript evaluation.**

Concentration in Aquatic Ecology

**Requirement Completed**

		<u>Date</u>	<u>Course</u>	<u>School</u>
		<u>Required Courses (5 cr)</u>		
ENV 419	Limnology (F)	3 cr		_____
ENV 421	Limnology Laboratory (F)	2 cr		_____

**15 credits chosen by advisement from:**

ENV 319	Biological Oceanography (Occ.)	3 cr		_____
ENV 423	Biology of Pollution (EoSO)	3 cr		_____
ENV 436	Water Quality Analysis (S)	4 cr		_____
ENV 437	Biostatistics (F)	3 cr		_____
ENV 439	Conservation Biology (EoFE)	3 cr		_____
ENV 457	Marine Biology-Bahamas (F)	3 cr		_____
ENV 462	Aquatic Toxicology (EoSE)	4 cr		_____
ENV 464	Aquaculture I (EoFO)	4 cr		_____
ENV 474	Aquaculture II (EoFE)	3 cr		_____
ENV 476	Animal Ecophysiology (EoFO)	3 cr		_____
ENV 483	Aquatic Invertebrates (EoSO)	4 cr		_____
ENV 484	Fish Ecology (EoSE)	3 cr		_____
ENV 488	Env. Impact Analysis (EoSME)	4-6 cr		_____
ENV 490	Fishery Tech./Fish Identification (F)	2 cr		_____
ESC 325	Wetland Systems (F)	3 cr		_____
ESC 418	Watershed Sciences (S)	3 cr		_____
ESC 412	Hydrology (F)	4 cr		_____
GEL 462	Groundwater (S)	4 cr		_____
ENV 498	Collaborative Research (F, S, Sm)	1-3 cr		_____

Total Needed

20 cr

**Co-requisite Course**

CHM 305 Organic Chemistry I (F)

4 cr

---

**Concentration in Terrestrial Ecology**

		Requirement Completed		<u>School</u>
		<u>Date</u>	<u>Course</u>	
<b>20 credits chosen by advisement from:</b>				
ENV 400 Plant Taxonomy (EoFO)	4 cr	_____		
ENV 405 Plant Ecology (EoFE)	4 cr	_____		
ENV 406 Wildlife Ecology (EoFE)	3 cr	_____		
ENV 423 Biology of Pollution (EoSO)	3 cr	_____		
ENV 427 Animal Behavior (EoFE)	3 cr	_____		
ENV 430 Ornithology (EoSE)	4 cr	_____		
ENV 437 Biostatistics (F)	3 cr	_____		
ENV 439 Conservation Biology (EoFE)	3 cr	_____		
ENV 440 Herpetology (EoSO)	4 cr	_____		
ENV 444 Terrest. Ecosystem Ecol. (EoSE)	4 cr	_____		
ENV 459 Mammalogy (EoFO)	4 cr	_____		
ENV 476 Animal Ecophysiology (EoFO)	3 cr	_____		
ENV 477 Field Biology (EoSmO)	4 cr	_____		
ENV 488 Env. Impact Analysis (EoSmE)	4-6 cr	_____		
ESC 313 Environmental Climatology (S)	3 cr	_____		
ESC 325 Wetland Systems (F)	3 cr	_____		
ESC 431 Environmental GIS Applications (S)	3 cr	_____		
ESC 455 Soils Science (F)	3 cr	_____		
ENV 498 Collaborative Research (F, S, Sm)	1-3 cr	_____		
Total Needed	20 cr			

## Co-requisite Course

CHM 305 Organic Chemistry I (F)

4 cr

\_\_\_\_\_

Concentration in Environmental Chemistry

**Requirement Completed**

Required Courses (19 cr)

		<u>Date</u>	<u>Course</u>	<u>School</u>
CHM 301 Chemical Safety (F)	1 cr	_____		
CHM 305 Organic Chemistry I (F)	4 cr	_____		
CHM 306 Organic Chemistry II (S)	4 cr	_____		
CHM 400 Chemistry Seminar (F)	1 cr	_____		
CHM 401 Chemistry Seminar (S)	1 cr	_____		
CHM 405 Physical Chemistry I (F)	3 cr	_____		
CHM 406 Physical Chemistry II (S)	3 cr	_____		
CHM 457 Environ. Geochemistry (EoFE)	3 cr	_____		
Total Needed	20 cr			

**Co-requisite Courses (14 cr)**

MTH 202 Calculus II (F,S)	3 cr	_____		
MTH 203 Calculus III (F,S)	3 cr	_____		
PHS 201 College Physics I (F)	4 cr	_____		
PHS 202 College Physics II (S)	4 cr	_____		
Total Needed	14 cr			

**Elective Courses (one is required)**

CHM 408/409 Phys. Meth. Lab I/II (F/S)	2 cr	_____		
ENV 436 Water Quality Analysis (S)	4 cr	_____		
ENV 488 Env. Impact Analysis (EoSmE)	4 cr	_____		
ENV 498 Collaborative Research (F,S,Sm)	1-3 cr	_____		

Concentration in the Earth Sciences

**Requirement Completed**

20 credits chosen by advisement from:

		<u>Date</u>	<u>Course</u>	<u>School</u>
ESC 313 Environmental Climatology (EoSE)	3 cr	_____		
ESC 314 Climatology Lab (EoSE)	1 cr	_____		
ESC 325 Wetland Systems (F)	3 cr	_____		
ESC 350 Computational Methods (F,S)	3 cr	_____		
ESC 412 Hydrology (F)	4 cr	_____		
ESC 418 Watershed Sciences (S)	3 cr	_____		
ESC 421 Air Pollution Meteorology (EoSO)	3 cr	_____		
ESC 420 Atmospheric Sensing Meth.(EoSE)	3 cr	_____		
ESC 431 Environmental GIS Applications (S)	3 cr	_____		
ESC 455 Soils Science (F)	3 cr	_____		
ESC 464 Environmental Internship (F,S,Sm)	1-3 cr	_____		
GEL 415 Geomorphology (F)	4 cr	_____		
GEL 457 Environmental Geochemistry (EoFE)	4 cr	_____		
GEL 462 Groundwater (S)	4 cr	_____		
ENV 419 Limnology (F)	3 cr	_____		
ENV 421 Limnology Lab (F)	2 cr	_____		
ENV 436 Water Quality Analysis (S)	4 cr	_____		
ENV 488 Environ. Impact Analysis (EoSmE)	4 cr	_____		
ENV 498 Collaborative Research (F,S,Sm)	1-3 cr	_____		
Total Needed	20 cr			

Co-requisite Courses:

PHS 115 General Physics I with Lab (F)	4 cr	_____
<b>or</b>		
PHS 201 College Physics I with Lab (F)	4 cr	_____
<b>or</b>		
CHM 305 Organic Chemistry I (F)	4 cr	_____