

4-23-2007

## Revision of the Undergraduate Major in Environmental Science

The College at Brockport, College Senate

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# SUNY BROCKPORT

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

Resolution # 30  
2006-2007  
COLLEGE SENATE

COLLEGE SENATE  
SUNY College at Brockport  
MAY 4 - 2007  
350 New Campus Drive  
Brockport, NY 14420-2925

RECEIVED

APR 26 2007

SUNY BROCKPORT  
PRESIDENT'S OFFICE

TO: Dr. John R. Halstead, College President  
FROM: The College Senate: <sup>23</sup> April 25, 2007  
RE: ⇒ I. Formal Resolution (*Act of Determination*)  
II. Recommendation (*Urging the Fitness of*)  
III. Other, For Your Information (*Notice, Request, Report, etc.*)

SUBJ: **Revision of the Undergraduate Major in Environmental Science**  
#40 06-07 UC

Signed: Jeffrey T. Lachbrook Date: 4/25/07  
(Dr. Jeffrey T. Lachbrook, 2006-07 College Senate President)

Please fill out the bottom portion and return document to the College Senate Office.

TO: The College Senate President

FROM: College President

RE: ⇒ I. Decision and Action Taken on Formal Resolution (circle choice)  
a. Accepted  
• \*Implementation Effective Date: Fall 2007  
\*Date resolution will begin to be used by the College. (i.e. spring, fall, when included in catalog, etc.)  
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: \_\_\_\_\_

DISTRIBUTED BY PRESIDENT'S OFFICE TO: \_\_\_\_\_

DISTRIBUTE ALSO TO: Originator, Academic Advisement, Registrar (as appropriate)

Signed: John R. Halstead Date: 4/30/07  
(Dr. John R. Halstead, President, SUNY College at Brockport)

**DEADLINE FOR SUBMISSIONS: FEBRUARY 23**

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 Undergraduate Major in Environmental Science</b>
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**2. BRIEF DESCRIPTION OF PROPOSAL:**

Based on Periodic Program Review of the Environmental Science major in 2005 and discussions within the Environmental Science Board (with representatives from the Departments of Chemistry, the Earth Sciences, and Environmental Science & Biology), we ask the College Senate to approve the following course substitutions (a mix of deletions and additions resulting in one less credit required in the core curriculum) for the BS in Environmental Science at SUNY Brockport.
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**3. ANTICIPATED DATE OF IMPLEMENTATION:**

<b>Begin in Fall 2007; Complete in Spring 2009</b>
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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>
<b>December 8, 2006</b>			

RECEIVED AT SENATE OFFICE 2/7/07

**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>
__ Enrollment Planning & Policies	Committee	2/7/07
__ Faculty & Professional Staff Policies	Executive Committee	4/2
__ General Education & Curriculum Policies	Senate	4/9, vote on 4/23
__ Graduate Curriculum & Policies	Senate President's Signature	4/25
__ Student Policies	College President's Signature	4/25
XX Undergraduate Curriculum & Policies	To Vice Provost	
	Other	

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

2. Side by side comparison of the old and new core curriculum in Environmental Science. *Italics* = remove course from the core curriculum. ***bold italics*** = add new course to the core curriculum.

Change	Old Program Course	Credits	New Program Course	Credits
None	ENV 202, Env. Sci.	4	ENV 202, Env. Sci.	4
a	ENV 111, Prin. Biology	4	<b><i>ENV 204, Biol. Organisms</i></b>	4
None	ENV 303, Ecology	4	ENV 303, Ecology	4
None	CHM 205, Coll. Chem. I	4	CHM 205, Coll. Chem. I	4
None	CHM 206, Coll. Chem. II	4	CHM 206, Coll. Chem. II	4
None	CHM 303, Analyt. Chem.	4	CHM 303, Analyt. Chem.	4
B	<i>CRJ 440, Env. Law</i>	3	<b><i>ENV 440, Env. Law &amp; Regs.</i></b>	3
C	<i>ESC 211, Intro. Meteorol.</i>	4	<b><i>ENV 492, Global Env. Issues</i></b>	3
None	GEL 201, Phys. Geology	4	GEL 201, Phys. Geology	4
D	MTH 201, Calculus I, <b>or</b>	3	MTH 201, Calculus I	3
	<i>ENV 437, Biostatistics, or</i>			
	<i>ESC 330, Comp. Methods</i>			
	<b>Total Credits</b>	<b>38</b>		<b>37</b>

### 3. Brief rationale for changes.

a. The PPR external reviewers noted that Environmental Science majors do not receive sufficient grounding in key biological concepts important to the discipline. We have made similar observations during oral comprehensive examinations for students with BS degrees in Environmental Science who are pursuing MS degrees in Biological Sciences. Because the ESB Department believes that it is not pedagogically sound to raise the total number of credits required for majors (already 62-72 depending on the track), we cannot simply add more introductory and mid-level biology courses to the core curriculum to deal with this problem. Therefore, we have designed one introductory course (see attached course registration form for ENV 204) to give majors a solid grounding in key biological concepts (particularly genetics, evolution and diversity of life) and skills (quantitative—proportions, unit conversions, logarithms and exponents, regression, simple statistical tests; Excel spreadsheets; library search tools; and scientific writing) needed for proper training in the discipline. Beginning in the spring of 2008, ENV 204 (Biology of Organisms with laboratory) will be taught for majors only by Dr. Christopher Norment, a recipient of the Chancellor's Award for Excellence in Teaching.

b. After their PPR, the Criminal Justice Department decided to stop teaching Environmental Law (CRJ 440). Beginning in the spring of 2007, an adjunct instructor/environmental lawyer will teach ENV 440 (Environmental Laws and Regulations; course registration attached). This course will do an excellent job of covering key environmental laws and regulations that many ENV majors will work with on a daily basis upon starting their careers.

c. From the inception of the Environmental Science Program in 2002, then Dean Maggiotto and the program faculty wanted to include a capstone experience in the curriculum. However, we could never find a way to staff the course with a tenure-track member of the ESB department. By adding a fifth tenure-track faculty member in 2007, and rearranging teaching and administrative duties in the department, it is now possible to include a capstone course in the curriculum (see attached course registration for ENV 492, Global Environmental Issues). The concept for the one-semester course is to have senior majors delve deeply into one global

environmental issue, and to hone their critical thinking, writing and speaking skills. Given that the department believes that it is not pedagogically sound to add credits to the major (see above), some other required course from the core curriculum had to be dropped to make room for the capstone experience. Based on the PPR external reviewers' comments, feedback from students, and our own observations, ESC 211, Meteorology, is the least objectionable choice. As the required introductory course for Meteorology majors, it focuses more on weather forecasting than on atmospheric environmental science, and is not meeting the needs of Environmental Science majors as envisioned 12 years ago when the core curriculum was first conceived.

d. The original mathematics requirement for the ENV major was MTH 201, Calculus I. Two years ago, that requirement was modified to include the options of MTH 201 or ENV 437, Biostatistics, or ESC 330, Computational Methods. Since that time, we have observed a significant percentage of majors (30-50%) struggling to achieve above D-level grades in numerically intensive courses such as Biostatistics and Analytical Chemistry. We hope that the quantitative reasoning abilities and computational skills imparted in Calculus I will improve our majors' abilities to deal more effectively with quantitative activities and expectations in upper division courses. Through advisement of native freshman and revision of articulation agreements, we are moving to a system where all ENV majors will take Calculus I by the end of the first semester of the junior year, so that they are prepared to take Analytical Chemistry in the second semester of the junior year (see item b above).

#### 4. Description of new courses (see also attached course registration form).

##### a. ENV 204 (lecture and laboratory)—Biology of Organisms

This introductory course for freshman and transfer environmental science majors will explore basic concepts in the biological sciences from a whole organism (animals and plants) and environmental science perspective. The unifying theme for the course will be evolution, and T. H. Dobzhansky's dictum that "Nothing in biology is understandable except in the light of evolution." Topics covered in lectures and laboratories include scientific method, molecular and population genetics, cell biology, diversity of life, and evolution and natural selection.

##### b. ENV 440 (lecture only)—Environmental Laws and Regulations

Introduction to key federal and state environmental laws, how branches of government interact to enforce environmental laws and regulations, and the roles of scientists and lawyers in resolving environmental problems. (*Replaces CRJ 440, Environmental Law*)

##### c. ENV 492 (seminar/discussion)—Global Environmental Issues

Capstone course for senior environmental science majors to explore one or more major global environmental issues during the semester. Students research the topic, analyze primary literature, engage in class discussion and formal speaking, and write a paper critically evaluating the issue and what should be done about it.

#### 5. Staffing Issues

a. With the addition of a new faculty member in the fall of 2007, the department will be able to rearrange teaching responsibilities so that the lecture portion of ENV 204, Biology of Organisms, can be taught each spring semester, beginning in 2008.

- b. The capstone course does not need to be taught for the first time until 2009, and we will also be able to cover it with an internal rearrangement of teaching responsibilities.
- c. For the time being, the Department has stable adjunct staffing for ENV 440/550, Environmental Laws and Regulations. It is also possible that the tenure track position to be filled in 2007 may be able to teach this course.

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. As evidenced by the names below, 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

Markus M. Hoffmann  
Assistant 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  
Assistant Professor, Department of Environmental Science & Biology