Eastern Illinois University  
Revised Course Proposal  
BIO 3850, Environmental Health and Sustainability

Please check one:  ___ New course  X Revised course

PART I: CATALOG DESCRIPTION

1. Course prefix and number, such as ART 1000: BIO 3850

2. Title (may not exceed 30 characters, including spaces): Environmental Health and Sustainability

3. Long title, if any (may not exceed 100 characters, including spaces): Environmental Health/Sustain

4. Class hours per week, lab hours per week, and credit [e.g., (3-0-3)]: 3-3-4 (previously 2-3-3)

5. Term(s) to be offered:  X Fall  X Spring  X Summer  On demand

6. Initial term of offering:  ___ Fall  X Spring  ___ Summer  Year: 2014

7. Course description: An introduction to the principles of environmental sciences for biology majors. This course investigates the foundations of environmental science with particular attention to environmental problems from a biological perspective and the costs and benefits to their “solutions” from the local to global scale. This course pays particular attention to how to analyze, interpret and present scientific information in the life sciences.

8. Registration restrictions:
   a. Equivalent Courses
      • Identify any equivalent courses (e.g., cross-listed course, non-honors version of an honors course).  None

      • Indicate whether coding should be added to Banner to restrict students from registering for the equivalent course(s) of this course.  ___ Yes  ___ No

   b. Prerequisite(s)
      • Identify the prerequisite(s), including required test scores, courses, grades in courses, and technical skills. Indicate whether any prerequisite course(s) MAY be taken concurrently with the proposed/revised course.
         BIO 1200G and BIO 1300G

      • Indicate whether coding should be added to Banner to prevent students from registering for this course if they haven’t successfully completed the prerequisite course(s).  X Yes  ___ No

         If yes, identify the minimum grade requirement and any equivalent courses for each prerequisite course:  D

   c. Who can waive the prerequisite(s)?
      ___ No one  X Chair  X Instructor  ___ Advisor  ___ Other (Please specify)

   d. Co-requisites (course(s) which MUST be taken concurrently with this one):
      None

   e. Repeat status:  X Course may not be repeated.
      ___ Course may be repeated once with credit.
Please also specify the limit (if any) on hours which may be applied to a major or minor.

f. **Degree, college, major(s), level, or class** to which registration in the course is restricted, if any: NA

g. **Degree, college, major(s), level, or class** to be excluded from the course, if any: NA

9. **Special course attributes** [cultural diversity, general education (indicate component), honors, remedial, writing centered or writing intensive] NA

10. **Grading methods** (check all that apply): **X** Standard letter  ____ CR/NC  ____ Audit  ____ ABC/NC
(“Standard letter”—i.e., ABCDF—is assumed to be the default grading method unless the course description indicates otherwise.)

Please check any special grading provision that applies to this course:

- [ ] The grade for this course will not count in a student’s grade point average.
- [ ] The credit for this course will not count in hours towards graduation.

If the student already has credit for or is registered in an equivalent or mutually exclusive course, check any that apply:

- [ ] The grade for this course will be removed from the student’s grade point average if he/she already has credit for or is registered in ___________ (insert course prefix and number).
- [ ] Credit hours for this course will be removed from a student’s hours towards graduation if he/she already has credit for or is registered in ___________ (insert course prefix and number).

11. **Instructional delivery method:** (Check all that apply.)

- [X] lecture  - [X] lab  ___ lecture/lab combined  ____ independent study/research
  ____ internship  ____ performance  ____ practicum or clinical  ____ study abroad
  ____ Internet  ____ hybrid  ____ other (Please specify)

**PART II: ASSURANCE OF STUDENT LEARNING**

1. **List the student learning objectives of this course:**
   Students will:
   1. identify fundamental biogeochemical principles including biological functions and describe how their interaction with human development has drastically influenced their trajectories;
   2. discuss, synthesize and apply the basic principles of data analysis, interpretation, and presentation for environmental problems;
   3. analyze and present scientific data sets using spreadsheet and graphical software
   4. evaluate the influence of science on environmental policy / decision making.
a. If this is a general education course, indicate which objectives are designed to help students achieve one or more of the following goals of general education and university-wide assessment:
   • EIU graduates will write and speak effectively.
   • EIU graduates will think critically.
   • EIU graduates will function as responsible citizens.
   NA

b. If this is a graduate-level course, indicate which objectives are designed to help students achieve established goals for learning at the graduate level:
   • Depth of content knowledge
   • Effective critical thinking and problem solving
   • Effective oral and written communication
   • Advanced scholarship through research or creative activity
   NA

2. Identify the assignments/activities the instructor will use to determine how well students attained the learning objectives:

<table>
<thead>
<tr>
<th>Assignment/Activity</th>
<th>(45%) Term exams(2), final exam</th>
<th>(5%) Quizzes</th>
<th>(20%) Quantitative assignments</th>
<th>(20%) Written assignments</th>
<th>(10%) Class participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify fundamental biogeochemical principles and interaction with human development</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Discuss, synthesize and apply basic principles of data analysis, interpretation, and presentation for environmental problems</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Analyze and present scientific data</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Evaluate influence of science on environmental policy / decision making</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

3. Explain how the instructor will determine students’ grades for the course:

Evaluation of students will be based on the following:
45% Two term examinations and a final examination
5% Quizzes (announced or unannounced)
20% Quantitative assignments (Laboratory and Class)
20% Written assignments (Laboratory and Class)
10% Class participation (Laboratory and Class)
4. For technology-delivered and other nontraditional-delivered courses/sections, address the following:
   a. Describe how the format/technology will be used to support and assess students’ achievement of the specified learning objectives:
   b. Describe how the integrity of student work will be assured:
   c. Describe provisions for and requirements of instructor-student and student-student interaction, including the kinds of technologies that will be used to support the interaction (e.g., e-mail, web-based discussions, computer conferences, etc.):

   NA

5. For courses numbered 4750-4999, specify additional or more stringent requirements for students enrolling for graduate credit. These include:
   a. course objectives;
   b. projects that require application and analysis of the course content; and
   c. separate methods of evaluation for undergraduate and graduate students.

   NA

6. If applicable, indicate whether this course is writing-active, writing-intensive, or writing-centered, and describe how the course satisfies the criteria for the type of writing course identified. (See Appendix *.)
   This course is a writing-active course. Writing activities include up to three lab reports and exams will include essay questions. All of these writing activities will be graded.

PART III: OUTLINE OF THE COURSE

Provide a week-by-week outline of the course’s content. Specify units of time (e.g., for a 3-0-3 course, 45 fifty-minute class periods over 15 weeks) for each major topic in the outline. Provide clear and sufficient details about content and procedures so that possible questions of overlap with other courses can be addressed. For technology-delivered or other nontraditional-delivered courses/sections, explain how the course content “units” are sufficiently equivalent to the traditional on-campus semester hour units of time described above.

Units of time: three 50-minute lectures, one 3-hour lab for 15 weeks. Below are two schedules that outline the course content, one for the lecture component of the course (including quantitative exercises) and another for the laboratory portion of the course.

LECTURE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Quantitative Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Environmental Science / Environmental Ethics / Environmental Policy</td>
<td>Experimental Design</td>
</tr>
<tr>
<td>2</td>
<td>Biogeochemistry</td>
<td>n/a</td>
</tr>
<tr>
<td>3</td>
<td>Renewable and non-renewable resources</td>
<td>Interpreting graphs, plotting environmental data</td>
</tr>
<tr>
<td>4</td>
<td>Waste management</td>
<td>n/a</td>
</tr>
<tr>
<td>5</td>
<td>Ecology and evolution</td>
<td>n/a</td>
</tr>
<tr>
<td>6</td>
<td>Environmental Systems</td>
<td>n/a</td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
<td>Quantitative Exercise</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>Population growth and feeding the masses (soil conservation &amp; agriculture)</td>
<td>Exploration of linear, geometric, and exponential growth curves</td>
</tr>
<tr>
<td>8</td>
<td>Toxicology and environmental health</td>
<td>n/a</td>
</tr>
<tr>
<td>9</td>
<td>Atmospheric pollution</td>
<td>Interpretation of long-term data sets</td>
</tr>
<tr>
<td>10</td>
<td>Global climate change</td>
<td>n/a</td>
</tr>
<tr>
<td>11</td>
<td>Degradation of aquatic systems</td>
<td>Interpretation of biological indices</td>
</tr>
<tr>
<td>12</td>
<td>Alternative and renewable energy</td>
<td>n/a</td>
</tr>
<tr>
<td>13</td>
<td>Biodiversity and ecosystem function</td>
<td>n/a</td>
</tr>
<tr>
<td>14</td>
<td>Natural resource management</td>
<td>Exploration of population management</td>
</tr>
<tr>
<td>15</td>
<td>Sustainable solutions</td>
<td>n/a</td>
</tr>
</tbody>
</table>

n/a = not applicable

---

**LABORATORY SCHEDULE**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Environmental Science / Environmental Ethics / Environmental Policy</td>
<td>Science and Popular Media</td>
</tr>
<tr>
<td>2</td>
<td>Biogeochemistry</td>
<td>Interpreting graphs, plotting environmental data</td>
</tr>
<tr>
<td>3</td>
<td>Renewable and non-renewable resources</td>
<td>Composting EIU dining hall scraps</td>
</tr>
<tr>
<td>4</td>
<td>Waste management</td>
<td>Sewage Treatment</td>
</tr>
<tr>
<td>5</td>
<td>Ecology and evolution</td>
<td>Wetland Mitigation</td>
</tr>
<tr>
<td>6</td>
<td>Environmental Systems</td>
<td>Indoor Air Quality Inspection</td>
</tr>
<tr>
<td>7</td>
<td>Population growth and feeding the masses (soil conservation &amp; agriculture)</td>
<td>Human Survivorship Changes</td>
</tr>
<tr>
<td>8</td>
<td>Toxicology and environmental health</td>
<td>Range of Tolerance / Environmental Contamination</td>
</tr>
<tr>
<td>9</td>
<td>Atmospheric pollution</td>
<td>Interpretation of long term data sets</td>
</tr>
<tr>
<td>10</td>
<td>Global climate change</td>
<td>Global Climate Change and Automobiles</td>
</tr>
<tr>
<td>11</td>
<td>Degradation of aquatic systems</td>
<td>Sampling for Environmental Pollutants</td>
</tr>
<tr>
<td>12</td>
<td>Alternative and renewable energy</td>
<td>Drinking water Treatment</td>
</tr>
<tr>
<td>13</td>
<td>Biodiversity and ecosystem function</td>
<td>Life Cycle Assessment</td>
</tr>
<tr>
<td>14</td>
<td>Natural resource management</td>
<td>Soil Characterization</td>
</tr>
<tr>
<td>15</td>
<td>Sustainable solutions</td>
<td>Landscaping for Energy Conservation</td>
</tr>
</tbody>
</table>
1. **Explain the department’s rationale for developing and proposing the course.**
   Purpose and need: BIO 3850 (Environmental Biology) was initially developed to provide undergraduate Biological Sciences majors a course that explores the environmental sciences in a biological framework. BIO 3850 is a core course for students who select the Environmental Biology option in the Biological Sciences program. The goal of Environmental Biology is to expose undergraduate Biological Sciences majors to a wide range of topics in Environmental Biology, a very diverse and interdisciplinary field of study. After the introduction of BIO 3850, the course was revised to introduce a laboratory component to provide students with hands-on learning opportunities in analyzing, interpreting and presenting scientific information as well as opportunities to learn important methods used by Environmental Biologists (e.g., analysis of water samples for contaminants and composting). After teaching the course for several years, faculty have discovered that two 50-min lecture periods do not provide sufficient time to cover the broad range of topics that students completing Environmental Biology programs should be familiar with. Consequently, faculty have needed to omit discussion of some topics completely and/or limit their discussions of other topics. Our experience has demonstrated that two 50-min lecture periods simply is not sufficient to cover all the necessary material. The purpose of the current course revision is to add one more 50-min lecture period, bringing the course up to three 50-min lecture periods and a single 3-hr lab; this will require a change from three to four credit hours. Additional time for lecture will allow students to become familiar with additional topics in the field and allow them to explore each topic in sufficient depth, improving their ability to master the concepts and apply them effectively in lab.

   a. **If this is a general education course, you also must indicate the segment of the general education program into which it will be placed, and describe how the course meets the requirements of that segment.**
      NA

   b. **If the course or some sections of the course may be technology delivered, explain why.**
      NA

2. **Justify the level of the course and any course prerequisites, co-requisites, or registration restrictions.**
   This course is intended for undergraduate Biological Sciences majors. Students must have completed BIO 1200G and BIO 1300G so they have the appropriate academic foundation and are familiar with the scientific method. It is proposed to be at the 3000 level since there is an expectation to manipulate and interpret scientific data (similar to Ecology – BIO 3800).

3. **If the course is similar to an existing course or courses, justify its development and offering.**
   Course material will overlap with BIO 2002G (non-majors course) since the same book and similar topics will be covered. Moreover, there is overlap in content with ESC/GEL 3010G and GEL 4335. These courses from Geology/Geography are taught from a different perspective. Specifically, as indicated, in this course each topic covered will be explored in more detail (than BIO 2002), and will be geared towards Biological Sciences majors (versus ESC/GEL 3010G and GEL 4335) and, thus, will cover topics such as responses to environmental perturbations from the cellular to organismal level. Further, this course will utilize the text more comprehensively (than BIO 2002) by incorporating the web exercises supplied by the publishing company. Supporting material, such as data sets, will be provided for the additional quantitative exercises outlined in sections 2 and 3. Lastly, the laboratory component is unique to this course and is essential for Biology majors to get hands-on learning experiences.
a. If the contents substantially duplicate those of an existing course, the new proposal should be discussed with the appropriate chairpersons, deans, or curriculum committees and their responses noted in the proposal.

NA

b. Cite course(s) to be deleted if the new course is approved. If no deletions are planned, note the exceptional need to be met or the curricular gap to be filled.

NA

4. Impact on Program(s):

a. For undergraduate programs, specify whether this course will be required for a major or minor or used as an approved elective.

Elective for undergraduates in Biological Sciences major; requirement for undergraduate Biological Science majors who have chosen the Environmental Biology option. The course is an approved elective in the Environmental Sustainability Minor and an optional core course in the Environmental Studies Minor.

b. For graduate programs, specify whether this course will be a core requirement for all candidates in a degree or certificate program or an approved elective.

This course will not be a core requirement for graduate students.

If the proposed course changes a major, minor, or certificate program in or outside of the department, you must submit a separate proposal requesting that change along with the course proposal. Provide a copy of the existing program in the current catalog with the requested changes noted.

PART V: IMPLEMENTATION

1. Faculty member(s) to whom the course may be assigned: The course will be taught by qualified faculty in the Department of Biological Sciences.

If this is a graduate course and the department does not currently offer a graduate program, it must document that it employs faculty qualified to teach graduate courses.

NA

2. Additional costs to students:

Students already pay a course fee of $35. Students will not be charged any additional costs.

Include those for supplemental packets, hardware/software, or any other additional instructional, technical, or technological requirements. (Course fees must be approved by the President’s Council.)

3. Text and supplementary materials to be used (Include publication dates):

PART VI: COMMUNITY COLLEGE TRANSFER

If the proposed course is a 1000- or 2000-level course, state either, "A community college course may be judged equivalent to this course" OR "A community college course will not be judged equivalent to this course." A community college course will not be judged equivalent to a 3000- or 4000-level course but may be accepted as a substitute; however, upper-division credit will not be awarded.

PART VII: APPROVALS

Date approved by the department or school: September 10, 2013

Date approved by the college curriculum committee: September 27, 2013

Date approved by CAA: October 10, 2013

*In writing-active courses, frequent, brief writing activities and assignments are required. Such activities -- some of which are to be graded – might include five-minute in-class writing assignments, journal keeping, lab reports, essay examinations, short papers, longer papers, or a variety of other writing-to-learn activities of the instructor's invention. Writing assignments and activities in writing-active courses are designed primarily to assist students in mastering course content, secondarily to strengthen students' writing skills. In writing-intensive courses, several writing assignments and writing activities are required. These assignments and activities, which are to be spread over the course of the semester, serve the dual purpose of strengthening writing skills and deepening understanding of course content. At least one writing assignment is to be revised by the student after it has been read and commented on by the instructor. In writing-intensive courses, students’ writing should constitute no less than 35% of the final course grade. In writing-centered courses (English 1001G, English 1002G, and their honors equivalents), students learn the principles and the process of writing in all of its stages, from inception to completion. The quality of students' writing is the principal determinant of the course grade. The minimum writing requirement is 20 pages (5,000 words).