Course Change Form

Date of Request: March 12, 2009
Page 1 of 1

Course Addition

1. Course Title: Intro to Oceanography *PS
   Prefix & Num. Geo 1080
   Instructor permission required: No
   Class Hours/Week: *LEC 3.00
   *LBC w/cr: 0.00
   *LNC w/no cr: 0.00
   Credits: 3.00
   Clinical: 0.00
   Practicum: 0.00
   Independent Study: 0.00
2. Pre-requisite(s): none
   Co-requisite(s): none
3. Semester to be Implemented: Fall, 2009
   Day ☑
   Extended Day ☑
   Grade type Regular
4. Cost Code: NAT303
   Lab Fee: $0.00
   Additional Fees: $0.00
   Potential WLF: 3.00

Explanation of Fees:

5. Is this course designed for a specific group? No
   Who?

6. Catalog Description: ☐ Now in Print, or ☑ Proposed Below:
   This course is intended to convey the essential principles of ocean science. Students completing this course should have an understanding of the earth's oceans including sea floor topography and composition, plate tectonics, seawater dynamics and chemistry, atmosphere and ocean currents, waves, coastal land forms, and marine life. In addition, students will learn how closely linked weather, climate, and humans are to the oceans. 3 lecture hours per week.

7. Course justification (attach sheets if needed):
   This course will be an addition to the General Education offering in the Physical Sciences. The course was developed for us by Dr. John Farrington, our visiting professor from Woods Hole Oceanographic Institute. He taught the three-credit course as a GEO 2990 course, but we would like to continue the course as GEO 1080. This course could also get students interested in taking the Marine Biology course that is taught in the Biology Department.

8. Are library resources adequate to support this change? Yes
   If not, how are those resources to be acquired?

9. Are technical and other resources available? Yes
   If not, how are those resources to be acquired?

10. Relationship to the curriculum: Would the course fill a G.E. requirement? Yes
    If yes, which G.E. area? Physical Science
    If it does not fill a G.E. requirement, would the course offer elective credit? Yes

11. Transferability of the course: List comparable courses at other colleges and universities:

<table>
<thead>
<tr>
<th>G.E.</th>
<th>Elective</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prefix &amp; Num.</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑</td>
<td>☐</td>
<td>Intro to Oceanography</td>
<td>3</td>
<td>GEO 1080</td>
<td>UVU</td>
</tr>
<tr>
<td>☑</td>
<td>☐</td>
<td>Oceanography</td>
<td>3</td>
<td>GEO1080</td>
<td>Snow</td>
</tr>
</tbody>
</table>

Approval Signatures:

Department Chair: Peter Van Valkenburg
Date: 3/13/09

Associate Dean/Dean: Karen J. Banko
Date: 3/13/09

Curriculum Chair: __________________________
Date: __________________

Academic VP: __________________________
Date: __________________
MEMORANDUM

To: Curriculum Committee
From: General Education Committee
Date: 05 March, 2009
Subject: GENERAL EDUCATION STATUS FOR GEOLOGY 1080: OCEANOGRAPHY

On 16 April 2007, the Department of Physical Sciences recommended Geology 1080: Oceanography, for Physical Science General Education status. On Friday 27 February 2009, the General Education committee met to consider its own recommendation.

Recommendation: Upon careful review of the enclosed materials and the Physical and Life Sciences Disciplinary Objectives, it is our considered recommendation that Geology 1080: Oceanography be granted GE status in the Physical Sciences area. We encourage the curriculum committee to recommend the same.

Attachment: General education course review packet.

Copy to:
Karen Bauer
Peter Van Valkenburg
GENERAL EDUCATION COURSE REVIEW FORM

COURSE ID: GEO 1080

COURSE NAME: INTRO TO OCEANOGRAPHY

COURSE FULFILLS (check the appropriate area):

Core Requirement

___ English
___ Mathematics
___ American Institutions
___ Computer Literacy
___ Information Literacy

Breadth & Depth Requirement

___ Physical and Life Sciences
___ Social Sciences
___ Fine Arts
___ Communication
___ Literature
___ Humanities
___ Foreign Language

GENERAL EDUCATION BASIC COGNITIVE & COMMUNICATION OUTCOMES

Rate the significance of each element in the course objectives (on a scale of 0-10, 10 being the highest)

8 Analytical Reasoning
10 Critical Reading
6 Quantitative Reasoning
9 Written and Oral Communication
DISCIPLINARY OBJECTIVES (attach completed form)

DEPARTMENT COURSE REVIEW RECOMMENDATION

The department recommends the following action (circle one):

APPROVE

APPROVE CONDITIONALLY (indicate specific curricular elements that must be addressed, and provide a timeline for completing the changes)

DISAPPROVE (explain below)
Department Review Body Signatures

Dept. Chair  
Karen L. Bauer  
Date 4/16/07

Faculty #1  
Mark Feinberg  
Date 4/16/07

Faculty #2  
Peter Von Der Mehden  
Date 4/16/07
Physical and Life Sciences

The significance of understanding the natural and physical world cannot be overestimated. College students must be able to understand the complexity and diversity of scientific knowledge and be able to connect those ideas both within and outside scientific disciplines. Therefore, courses meeting General Education Physical and Life Sciences requirements must, at a minimum, achieve the following goals:

- Demonstrate knowledge of basic fundamental laws, concepts, and theories in the physical and life sciences and be able to apply them to everyday life
- Emphasize the use of scientific models to elucidate the logical implications of theory and then express those consequences in ways that permit testing of theoretical ideas
- Demonstrate knowledge of the process of science by being able to utilize data in the form of tables, graphs, and charts through interpretation, and then communicating those findings in written form
- Demonstrate a knowledge of important historical discoveries and theories that shaped the sciences and be able to indicate how they advanced our knowledge and ability to interpret, view, and judge the world today

To meet these goals, courses in the physical and life sciences will require students to complete, at a minimum, the following:

- Homework assignments that require reading and writing in order to demonstrate understanding of relevant knowledge
- Participate in laboratory experiences (3 to 5), significant in-class demonstrations (used at least during one-quarter of the classes), and/or field trips (one or more)
- Take examinations that measure retention of course materials and require at least some use of tables, graphs, and charts, as well as communication of ideas through written responses
- Participate in a significant number of lectures, classroom discussions and other in-class activities in order to improve problem-solving and scientific reasoning skills
DISCIPLINARY OBJECTIVES FOR PHYSICAL / LIFE SCIENCE COURSES

Based on a review of the course syllabus, representative assignments, and any other relevant documentation, certify that the course meets each of the objectives listed below.

<table>
<thead>
<tr>
<th>Homework assignments that require reading and writing in order to demonstrate understanding of relevant knowledge</th>
<th>AGREE</th>
<th>DISAGREE</th>
<th>CONDITIONAL</th>
</tr>
</thead>
</table>

If "Agree," indicate specific curricular elements that achieve this objective

Homework assignments requiring reading of textbook sections in preparation for class discussions.

Homework assignments of keyword or concept definitions submitted in written form. See examples attached.

Homework assignment consisting of an outline of the final class essay to be submitted at the end of the semester in place of a final examination.

Class essay on a topic of science fiction that is plausible based on what is currently known about the oceans. Eight to twelve pages. See "Class Paper" section of Syllabus attached.

If "Disagree" or "Conditional," explain below.
<table>
<thead>
<tr>
<th>Participate in laboratory experiences (3 to 5), significant in-class demonstrations (used at least during one-quarter of the classes), and/or field trips (one or more)</th>
<th>AGREE</th>
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<td></td>
<td>DISAGREE</td>
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<td>CONDITIONAL</td>
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If "Agree," indicate specific curricular elements that achieve this objective.

Demonstration of ocean deep water circulation in a modest sized rectangular plastic container. Waters of various salinities (table salt) representing waters of various densities that had been dyed with food coloring of different colors were slowly poured into the container by students. Each student had a chance to participate. In addition to the layering of the waters according to densities and the travel across the bottom of the container or at mid levels, the class observed the internal waves formed at the density discontinuities.

We used web site searches in the class to investigate up-to-date findings in specific content areas. For example, we watched a time-delayed recording of communications between Space Station Alpha One astronauts and the Research Submersible DSV Alvin scientists underwater at about 2,500 meters to gain an appreciation of how difficult it is for humans to communicate underwater – even with sound. This lead to the sound transmission and receiving in the ocean section of the course and how marine mammals and other animals communicate. We on line to the web to listen to such sounds from a web site compilation. Students were involved in addition to the instructor in picking the actual examples for listening.

The BBC "Blue Planet" DVD series was used several times in class for the ocean life section of the course and to demonstrate how life interacted with the physical, geological and chemical aspects of the ocean habitats. A field trip to the ocean was not feasible this semester, but could be done in the future to California’s Monterey Bay area or Scripps Institution of Oceanography, La Jolla, CA.

If "Disagree" or "Conditional," explain below.
<table>
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<tr>
<th>Take examinations that measure retention of course materials and require at least some use of tables, graphs, and charts, as well as communication of ideas through written responses</th>
<th>AGREE</th>
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<tr>
<td>DISAGREE</td>
<td></td>
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<tr>
<td>CONDITIONAL</td>
<td></td>
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*If “Agree,” indicate specific curricular elements that achieve this objective*

Practice Examinations were provided to the students for each section of the course (other than the first section) to provide them with a study guide. Actual examination questions had a minor overlap in content.

See attached example examinations. Requirements of sketches of processes in the oceans or annotations to figures provided were part of all examinations.

*If “Disagree” or “Conditional,” explain below.*
Participate in a significant number of lectures, classroom discussions and other in-class activities in order to improve problem-solving and scientific reasoning skills

<table>
<thead>
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<th>AGREE</th>
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*If "Agree," indicate specific curricular elements that achieve this objective*

Each lecture has a Socratic element to it with specific students asked leading questions about the previous and/or present lecture material. Then other students are asked by name to join in the discussion. At least 10 minutes of each 50 minute class are conducted in this manner to encourage students to read assigned reading and to improve problem solving and reasoning skills.

Students individually, or in teams of two to three, were assigned a particular ocean sampling or ocean property measurement and then directed to an initial web site on ocean instruments to get them started on this homework assignment. This prepared them to present a fifteen minute mini-lecture on the specific sampling or measurements instrument or instruments and they answered questions from the class and the Instructor. Classmates and the instructor rated their presentation and answers to questions. The presenters were provided anonymous feedback with the exception of the Instructor’s comments and their grade. (See attached example of rating form and evaluation).

Frequently the instructor pointed out how the scientific method and scientific research actually works using examples from lectures and handouts of articles written at Scientific American content level or above.

The interdisciplinary and multidisciplinary nature of studies of the oceans and the connections to modern societal challenges such as oceans and climate; fisheries depletions, human uses of the coast and coastal ocean were incorporated into the course and discussions and required the students to think about levels of uncertainty in scientific knowledge and how they interact with policy and management questions. The Intergovernmental Panel on Climate Change Summary of the Science for Policy Makers (February 2007) was downloaded from the IPSS web site, copied and given to each student. This formed the basis for class discussion of the role of the oceans in climate change.

*If "Disagree" or "Conditional," explain below.*