California State University Channel Islands

NEW COURSE PROPOSAL

Courses must be submitted by November 3, 2008, for priority catalog review.

DATE (Change if modified and redate file with current date) 10/13/2008 REV 12.16.08
PROGRAM AREA(S) CHEMISTRY

1. Course Information. [Follow accepted catalog format.]
Prefix(es) (Add additional prefixes if cross-listed) and Course No. CHEM 101
Title: CHEMISTRY AND THE ENVIRONMENT Units: 3

Prerequisites Corequisites Consent of Instructor Required for Enrollment

Catalog Description (Do not use any symbols): Relates the fundamentals of chemistry to contemporary environmental issues. Introduction to environmental chemistry without assuming any prior knowledge of chemistry and mathematics. Applies scientific principles to environmental problems concerning energy, air quality, the atmosphere, water quality, and waste management. Essential foundational science needed to understand these problems are also discussed.

Grading Scheme: Repeatability: Course Level Information:
X A-F Grades Repeatable for a maximum of Undergraduate
Credit/No Credit Total Completions Allowed Multiple Enrollment in Same Semester Post-Baccalaureate/Credential
Optional (Student Choice)

Mode of Instruction/Components (Hours per Unit are defaulted).

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<th>Units</th>
<th>Hours per Unit</th>
<th>Benchmark Enrollment</th>
<th>Graded Component</th>
<th>CS &amp; HEGIS #</th>
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<td>Lecture</td>
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<td>Seminar</td>
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Leave the following hours per week areas blank. The hours per week will be filled out for you.
3 hours lecture per week
hours blank per week

2. Course Attributes:

X General Education Categories: All courses with GE category notations (including deletions) must be submitted to the GE website: http://summit.csuci.edu/geapproval. Upon completion, the GE Committee will forward your documents to the Curriculum Committee for further processing.

A (English Language, Communication, Critical Thinking)
X A-1 Oral Communication
A-2 English Writing
A-3 Critical Thinking

B (Mathematics, Sciences & Technology)
X B-1 Physical Sciences
B-2 Life Sciences – Biology
B-3 Mathematics – Mathematics and Applications
B-4 Computers and Information Technology

C (Fine Arts, Literature, Languages & Cultures)
C-1 Art
3. **Justification and Requirements for the Course.** (Make a brief statement to justify the need for the course)

A. **Justification:** It is important for all students to understand the environment. All university graduates should have some understanding of the contemporary environmental issues of our day, including ozone depletion, climate change, acid rain, water pollution, waste disposal, and hazardous waste. These problems affect us all, and the everyday decisions that we make affect these problems. Chemistry, the study of matter, is central to all of these environmental issues. This course is designed to take a non-mathematical approach to environmental chemistry. There is already much interest throughout the general population about the environment, and this interest is rising. This course will help our graduates be informed about the scientific principles behind the environmental problems everyone has heard about in the news. By discussing science in this way, we are also making these scientific principles more accessible to the non-science student.

B. **Degree Requirement:**

   - Requirement for the Major/Minor
   - Elective for the Major/Minor

   **Note:** Submit Program Modification if this course changes your program.

4. **Learning Objectives.** *(List in numerical order)*

   Upon completion of the course, the student will be able to:
   - Describe the Scientific Method.
   - Recognize conclusions that are derived from the scientific process.
   - Relate contemporary environmental issues to fundamental principles.
   - Discuss solutions to designed to limit negative impact on the environment.
   - To analyze human impact on the environment that come from some everyday decisions we make.
   - Apply scientific principles to the environmental problems concerning energy, air quality, the global atmosphere, water quality, and waste management.
5. **Course Content in Outline Form.** *Be as brief as possible, but use as much space as necessary*

I. Background
   A. Agriculture, Urbanization, and the Industrial Revolution
   B. Science and Scientific Method
   C. Toxicology
   D. Basic Concepts – Concentration, Classes of Matter, Atoms and Molecules

II. Energy and Modern Society
   A. Matter and Energy
   B. Widely Used Energy Sources
   C. Emerging Energy Sources
   D. Energy Conservation

II. Air Pollution
   A. Industrial and Photochemical Smog
   B. Acid Rain
   C. Air Quality
   D. Air Pollution Reduction

III. Indoor Air Contaminants
   A. Combustion Products
   B. Volatiles
   C. Radon
   D. Remedies for Indoor Air Contaminants

IV. Global Atmospheric Change
   A. Climate Change
   B. Ozone Depletion
   C. International Response to Global Atmospheric Change

V. Water Pollution
   A. Surface Water
   B. Groundwater Pollutants
   C. Water Pollution Control

VI. Solid Waste
   A. Sources of Solid Waste
   B. Composition of Solid Waste
   C. Solid Waste Disposal, Recycling, and Reuse

VII. Hazardous Waste
   A. Historical Approaches to Waste Disposal
   B. Current Practices in Waste Disposal
   C. Radioactive Waste

Does this course content overlap with a course offered in your academic program? Yes ☐ No ☒
If YES, what course(s) and provide a justification of the overlap. ☐

Does this course content overlap a course offered in another academic area? Yes ☐ No ☒
If YES, what course(s) and provide a justification of the overlap. ☐

Overlapping courses require Chairs’ signatures.

6. **Cross-listed Courses** *(Please note each prefix in item No. 1)*
   A. List Cross-listed Courses (Signature of Academic Chair(s) of the other academic area(s) is required).
      List each cross-listed prefix for the course: ☐

   B. Program responsible for staffing: ☐

7. **References.** *Provide 3 - 5 references*

   - Beard, J.M. *Environmental Chemistry and Society*, CRC Press 2009
8. Tenure Track Faculty Qualified to Teach This Course.

Simone Aloisio, Blake Gillespie, Phil Hampton

9. Requested Effective Date:
First semester offered: Fall 2009

10. New Resources Requested. Yes [X] No
If YES, list the resources needed.

A. Computer Needs (data processing, audio visual, broadcasting, other equipment, etc.) [X]

B. Library Needs (streaming media, video hosting, databases, exhibit space, etc.) [X]

C. Facility/Space/Transportation Needs [X]

D. Lab Fee Requested (please refer to Dean’s Office for additional processing) Yes [X] No [X]

E. Other [X]

11. Will this new course alter any degree, credential, certificate, or minor in your program? Yes [X] No
If YES attach a program update or program modification form for all programs affected.
Priority deadline for New Minors and Programs: October 6, 2008 of preceding year.
Priority deadline for Course Proposals and Modifications: November 3, 2008, of preceding year.
Last day to submit forms to be considered during the current academic year: April 15th.

Simone Aloisio
Phil Hampton

Proposer of Course (Type in name. Signatures will be collected after Curriculum approval) Date 10/14/2008
Request for CHEM 101: CHEMISTRY AND THE ENVIRONMENT to be added to GE Category B1: Physical Sciences -- Chemistry, Physics, Geology, and Earth Sciences.

Committee Response:

**Approved by committee on 11-13-2008**

Criteria and Justifications Submitted:

- **Promote the understanding and appreciation of the methodologies of math or science as investigative tools and the limitations of mathematical or scientific endeavors**

  This course promotes the understanding and appreciation of the scientific method as applied to environmental issues. A significant portion of the course will be devoted to discussing how the scientific method is applied to these problems. The first two learning objects of the class, listed below, are related to this. 1)Describe the Scientific Method. 2)Recognize conclusions that are derived from the scientific process.

- **Present mathematical or scientific knowledge in a historical perspective and the influences of math or science on the development of world civilizations, both past and present**

  Each environmental issue has a historical perspective that will be discussed. It is particularly relevant for students to see how discovery of the science behind environmental problems can lead to policies on prevention and remediation of these problems. Students will analyze and discuss this.

- **Apply inductive and deductive reasoning processes and explore fallacies and misconceptions in the mathematical or scientific areas**

  Students will learn to apply inductive and deductive reasoning and how it is used within the scientific processes of hypothesizing, testing by experimentation, concluding, and prediction by use of a model. Exploring the limitations of this process is necessary to evaluate scientific assessments of these environmental problems, and is something that will be explored in this class.

- **Present the principles and concepts of the physical sciences and the physical universe**

  This course will present the fundamental principles of matter and energy. It will relate these principles to contemporary environmental issues and their potential solutions. Knowing these principles will help students understand how their everyday decisions can have an impact on the environment.
If your course has a General Education Component or involves Center affiliation, the Center will also sign off during the approval process.

Multiple Chair fields are available for cross-listed courses.

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