

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:☒ A-F Grades☐ Credit/No Credit☐ Optional (Student Choice)**Repeatability:**☐ Repeatable for a maximum of unitsTotal Completions Allowed ☐ Multiple Enrollment in Same Semester**Course Level Information:**☒ Undergraduate☐ Post-Baccalaureate/Credential Graduate**Mode of Instruction/Components** (*Hours per Unit are defaulted*).

	Units	Hours per Unit	Benchmark Enrollment	Graded Component	CS & HEGIS # (Filled in by the Dean)
Lecture	3	1	54	☐	
Seminar	☐	1	☐	☐	
Laboratory	☐	3	☐	☐	
Activity	☐	2	☐	☐	
Field Studies	☐		☐	☐	
Indep Study	☐		☐	☐	
Other Blank	☐		☐	☐	

Leave the following hours per week areas blank. The hours per week will be filled out for you.

3 hours ☐ lecture per weekhours ☐ blank per week**2. Course Attributes:**

☒ **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)☐ A-1 Oral Communication☐ A-2 English Writing☐ A-3 Critical Thinking**B (Mathematics, Sciences & Technology)**☒ 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

C-2 Literature Courses

C-3a Language

C-3b Multicultural

D (Social Perspectives)

E (Human Psychological and Physiological Perspectives)

UDIGE/INTD Interdisciplinary

Meets University Writing Requirement

Meets University Language Requirement

American Institutions, Title V Section 40404: Government US Constitution US History

Refer to website, Exec Order 405, for more information: <http://senate.csuci.edu/comm/curriculum/resources.htm>

Service Learning Course (Approval from the Center for Community Engagement must be received before you can request this course attribute).

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 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
- III. Air Pollution
 - A. Industrial and Photochemical Smog
 - B. Acid Rain
 - C. Air Quality
 - D. Air Pollution Reduction
- IV. Indoor Air Contaminants
 - A. Combustion Products
 - B. Volatiles
 - C. Radon
 - D. Remedies for Indoor Air Contaminants
- V. Global Atmospheric Change
 - A. Climate Change
 - B. Ozone Depletion
 - C. International Response to Global Atmospheric Change
- VI. Water Pollution
 - A. Surface Water
 - B. Groundwater Pollutants
 - C. Water Pollution Control
- VII. Solid Waste
 - A. Sources of Solid Waste
 - B. Composition of Solid Waste
 - C. Solid Waste Disposal, Recycling, and Reuse
- VIII. 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** ☒ X
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** ☒ X
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

Nathenson, J. Basic Environmental Technology, Pearson 2007

Withgott, J.H.; and Brennan, S.R. Environment: The Science behind the Stories Prentice Hall 2007

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 ☐ No ☒

If YES, list the resources needed.

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

☐

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

☐

C. Facility/Space/Transportation Needs

☐

D. Lab Fee Requested (please refer to Dean's Office for additional processing) Yes ☐ No ☐

E. Other

☐

11. Will this new course alter any degree, credential, certificate, or minor in your program? Yes ☐ 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

10/14/2008

Phil Hampton

Proposer of Course (Type in name. Signatures will be collected after Curriculum approval)

Date

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.

Approval Sheet

Program/Course: CHEM 101

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.

Program Chair		
	Signature	Date
Program Chair		
	Signature	Date
Program Chair		
	Signature	Date
General Education Chair		
	Signature	Date
Center for International Affairs Director		
	Signature	Date
Center for Integrative Studies Director		
	Signature	Date
Center for Multicultural Engagement Director		
	Signature	Date
Center for Civic Engagement Director		
	Signature	Date
Curriculum Chair		
	Signature	Date
Dean of Faculty		
	Signature	Date