CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

COURSE MODIFICATION PROPOSAL

Courses must be submitted by November 2, 2009, to make the next catalog (2010–2011) production

DATE (CHANGE DATE EACH TIME REVISED): 9/29/2009 REV 11.2.09

PROGRAM AREA(S): CHEMISTRY

Directions: All of sections of this form must be completed for course modifications. All documents are stand alone sources of course information.

1. Course Information.
   [Follow accepted catalog format.] (Add additional prefixes if cross-listed)

<table>
<thead>
<tr>
<th>OLD</th>
<th>NEW</th>
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</thead>
<tbody>
<tr>
<td>Prefix CHEM</td>
<td>Course# 123</td>
</tr>
<tr>
<td>General Chemistry I Problem-Solving</td>
<td>Units (1)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours lecture per week</td>
<td>1</td>
</tr>
<tr>
<td>Hours activity per week</td>
<td>1</td>
</tr>
<tr>
<td>Prerequisites: CHEM 121</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Consent of Instructor Required for Enrollment</td>
</tr>
<tr>
<td>Corequisites:</td>
<td>x</td>
</tr>
<tr>
<td>Catalog Description (Do not use any symbols):</td>
<td>An instructor/peer-supervised interactive problem-solving session for students in CHEM 121 where students work in small groups on problems related to the content in CHEM 121.</td>
</tr>
<tr>
<td>General Education Categories</td>
<td>CR/NC</td>
</tr>
<tr>
<td>Lab Fee Requested</td>
<td>x A - F</td>
</tr>
<tr>
<td>Course Level:</td>
<td>Optional</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>Post-bac/Credential</td>
</tr>
<tr>
<td>X</td>
<td>(Student’s choice)</td>
</tr>
</tbody>
</table>

2. Mode of Instruction (Hours per Unit are defaulted)

<table>
<thead>
<tr>
<th>Existing</th>
<th>Proposed</th>
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</thead>
<tbody>
<tr>
<td>Units</td>
<td>Hours Per Unit</td>
</tr>
<tr>
<td>Lecture</td>
<td>1</td>
</tr>
<tr>
<td>Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Lab</td>
<td>3</td>
</tr>
<tr>
<td>Activity</td>
<td>1</td>
</tr>
<tr>
<td>Field Studies</td>
<td></td>
</tr>
<tr>
<td>Indep Study</td>
<td></td>
</tr>
<tr>
<td>Other blank</td>
<td></td>
</tr>
</tbody>
</table>

   | Units | Hours Per Unit | Benchmark | Graded |
   | Lecture | 1 | | |
   | Seminar | 1 | | |
   | Lab | 3 | | |
   | Activity | 1 | 2 | | |
   | Field Studies | | | |
   | Indep Study | | | |
   | Other blank | 1 | 30 | x | |

3. 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).

4. Justification and Requirements for the Course. [Make a brief statement to justify the need for the course]

OLD
This course is an optional problem-solving session for the first semester general chemistry course (CHEM 121) and provides students with an interactive, problem-solving session where students work in small teams to solve problems in chemistry.

NEW
This course is an optional problem-solving session for the first semester general chemistry course (CHEM 121) and provides students with an interactive, problem-solving session where students work in small teams to solve problems in chemistry.

Submit Program Modification if this course changes your program.

5. Learning Objectives. (List in numerical order. You may wish to visit resource information at the following website: http://senate.csuci.edu/comm/curriculum/resources.htm)

Upon completion of the course, the student will be able to:

OLD
Students who successfully complete this course will be able to:

- Evaluate a scientific measurement and distinguish between scientific data
- Describe matter and energy in terms of the units and terminology that is used by modern scientists
- Identify stoichiometric relationships and balance chemical equations
- Explain the structure of an atom in terms of its basic parts and properties

NEW
Students who successfully complete this course will be able to:

- Evaluate a scientific measurement and distinguish between scientific data
- Describe matter and energy in terms of the units and terminology that is used by modern scientists
- Identify stoichiometric relationships and balance chemical equations
- Explain the structure of an atom in terms of its basic parts and properties
• Explain the interaction between electrons and light quantitatively
• Describe the properties of electrons and how they relate to chemical reactivity
• Identify the chemical properties of elements based on their periodic trends
• Explain the nature of the different types of chemical bonds in molecules
• Evaluate the properties of a gas phase species
• Rationalize chemical reactivity in terms of the thermodynamic properties of reactants and products

6. Course Content in Outline Form. (Be as brief as possible, but use as much space as necessary)

OLD

Scientific Measurement
The scientific method
SI units and the metric system
Significant Figures
Unit Conversion
Mass and Energy Units
Matter and Energy
States of Matter
Pure substances and mixtures
Atoms and Molecules
Temperature
Physical and chemical properties
Stoichiometry
The mole and Avagadro’s Number
The chemical equation
Balancing chemical equations
Mole-to-Mass conversion
Solutions and Dilutions
Atoms and Elements
Names and Symbols
The nuclei of atoms
Radioactivity
Electrons and Photons
Particle-Wave duality
Electron arrangement in atoms
Intro to quantum theory
The photoelectron effect
Atomic spectra
The uncertainty principle
Atomic Orbitals
The Periodic Table
History of the periodic table
Metals and non-metals
Periodic trends
Main group elements and Transition metals
Electron affinity
Ionization
The Chemical Bond
Ionic and Covalent bonds

NEW

Scientific Measurement
The scientific method
SI units and the metric system
Significant Figures
Unit Conversion
Mass and Energy Units
Matter and Energy
States of Matter
Pure substances and mixtures
Atoms and Molecules
Temperature
Physical and chemical properties
Stoichiometry
The mole and Avagadro’s Number
The chemical equation
Balancing chemical equations
Mole-to-Mass conversion
Solutions and Dilutions
Atoms and Elements
Names and Symbols
The nuclei of atoms
Radioactivity
Electrons and Photons
Particle-Wave duality
Electron arrangement in atoms
Intro to quantum theory
The photoelectron effect
Atomic spectra
The uncertainty principle
Atomic Orbitals
The Periodic Table
History of the periodic table
Metals and non-metals
Periodic trends
Main group elements and Transition metals
Electron affinity
Ionization
The Chemical Bond
Ionic and Covalent bonds
Electronegativity
Lewis structures
Oxidation number of atoms
The shape of molecules
Polarity
Hydrogen bonding
Gases
Pressure and temperature
Partial pressure
Ideal gas equation
Chemical Thermodynamics
Heat and work
Heat capacity
Entropy
State Functions
Reversible and irreversible changes
Enthalpy of reaction and of formation
Bond-dissociation and formation

Electronegativity
Lewis structures
Oxidation number of atoms
The shape of molecules
Polarity
Hydrogen bonding
Gases
Pressure and temperature
Partial pressure
Ideal gas equation
Chemical Thermodynamics
Heat and work
Heat capacity
Entropy
State Functions
Reversible and irreversible changes
Enthalpy of reaction and of formation
Bond-dissociation and formation

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.

7. 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).
   B. List each cross-listed prefix for the course:  
   C. Program responsible for staffing:  

8. References. [Provide 3-5 references]

OLD

Pauling, L. General Chemistry, 3rd Ed., 1970
Chang, R. Chemistry, 7th Ed., 2001
Silberberg, M.S. Chemistryi, 3rd Ed., 2003
Zumdahl, S.S.; Zumdahl, S. Chemistry, 2000

NEW

Pauling, L. General Chemistry, 3rd Ed., 1970
Chang, R. Chemistry, 7th Ed., 2001
Silberberg, M.S. Chemistryi, 3rd Ed., 2003
Zumdahl, S.S.; Zumdahl, S. Chemistry, 2000

9. Tenure Track Faculty qualified to teach this course.

Simone Aloisio, Blake Gillespie, Phil Hampton

10. Requested Effective Date or First Semester offered: Fall 2010

11. New Resource 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: Yes ☐ No ☒ (Refer to the Dean’s Office for additional processing)

E. Other. ☐

12. Indicate Changes and Justification for Each. [Check all that apply and follow with justification. Be as brief as possible but, use as much space as necessary.]

<table>
<thead>
<tr>
<th>Course title</th>
<th>Course Content</th>
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</thead>
<tbody>
<tr>
<td>Prefix/suffix</td>
<td>Course Learning Objectives</td>
</tr>
<tr>
<td>Course number</td>
<td>References</td>
</tr>
<tr>
<td>Units</td>
<td>GE</td>
</tr>
<tr>
<td>Staffing formula and enrollment limits</td>
<td>x Other Grading</td>
</tr>
<tr>
<td>x Prerequisites/Corequisites</td>
<td>Reactivate Course</td>
</tr>
<tr>
<td>Catalog description</td>
<td></td>
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<tr>
<td>Mode of Instruction</td>
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</table>

Justification: The department met and decided that credit/no-credit was a more appropriate grading scheme for this type of course. Students typically either did the work required or did not. Also, the mode of instruction and pre-requisite were incorrectly listed in the original course proposal. We have also taught it as a one-hour course, and have always had a co-requisite, not a pre-requisite.

13. Will this course modification 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 5, 2009 of preceding year.

Priority deadline for Course Proposals and Modifications: November 2, 2009.

Last day to submit forms to be considered during the current academic year: April 15th.

Simone Aloisio  
9/29/2009

Proposer(s) of Course Modification  
Date

Type in name. Signatures will be collected after Curriculum approval.
**Approval Sheet**

**Course:**

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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<th>Program Chair</th>
<th>Signature</th>
<th>Date</th>
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<th>Signature</th>
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<tr>
<th>General Education Chair</th>
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<tr>
<th>Center for Intl Affairs Director</th>
<th>Signature</th>
<th>Date</th>
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<tr>
<th>Center for Integrative Studies Director</th>
<th>Signature</th>
<th>Date</th>
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<tr>
<th>Center for Multicultural Engagement Director</th>
<th>Signature</th>
<th>Date</th>
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<tr>
<th>Center for Civic Engagement and Service Learning Director</th>
<th>Signature</th>
<th>Date</th>
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<table>
<thead>
<tr>
<th>Curriculum Chair</th>
<th>Signature</th>
<th>Date</th>
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<thead>
<tr>
<th>Dean of Faculty</th>
<th>Signature</th>
<th>Date</th>
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