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>
</tr>
</thead>
<tbody>
<tr>
<td>Prefix CHEM</td>
<td>Prefix CHEM</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>General Chemistry II Problem-Solving</td>
<td>General Chemistry II Problem-Solving</td>
</tr>
<tr>
<td>Units (1)</td>
<td>Units (1)</td>
</tr>
<tr>
<td>1 hours lecture per week</td>
<td>1 hours lecture per week</td>
</tr>
<tr>
<td>1 hours activity per week</td>
<td>1 hours discussion per week</td>
</tr>
<tr>
<td>Prerequisites: CHEM 122</td>
<td>Prerequisites: CHEM 122</td>
</tr>
<tr>
<td>Consent of Instructor Required for Enrollment</td>
<td>Consent of Instructor Required for Enrollment</td>
</tr>
<tr>
<td>Corequisites:</td>
<td>Corequisites: CHEM 122</td>
</tr>
<tr>
<td>Catalog Description (Do not use any symbols):</td>
<td>Catalog Description (Do not use any symbols):</td>
</tr>
<tr>
<td>An instructor/peer-supervised interactive problem-solving session for students in CHEM 122 where students work in small groups on problems related to the content in CHEM 122.</td>
<td>An instructor/peer-supervised interactive problem-solving session for students in CHEM 122 where students work in small groups on problems related to the content in CHEM 122.</td>
</tr>
</tbody>
</table>

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

   Hegis Code(s) (Provided by the Dean)

<table>
<thead>
<tr>
<th>Existing</th>
<th>Proposed</th>
</tr>
</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>2</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>

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 second semester general chemistry course (CHEM 122), 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 second semester general chemistry course (CHEM 122), 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)

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

- Describe chemical equilibrium both qualitatively and quantitatively
- Explain solubility of material in aqueous solutions and be familiar with non-aqueous solutions
- Solve problems dealing with acid-base chemistry
- Describe oxidation-reduction chemistry qualitatively and in terms of equilibrium

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

- Describe chemical equilibrium both qualitatively and quantitatively
- Explain solubility of material in aqueous solutions and be familiar with non-aqueous solutions
- Solve problems dealing with acid-base chemistry
- Describe oxidation-reduction chemistry qualitatively and in terms of equilibrium
• Evaluate problems involving complex equilibrium (e.g. solubility in acidic solution)

• Identify the most common crystal structures of chemicals

• Describe the chemistry of common inorganic species

• Identify different types of organic species

• Explain the differences between basic categories of biologically important chemicals

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

OLD

Chemical Equilibrium
Vapor pressure
Melting and boiling
Gas Phase Equilibrium
Equilibrium and temperature
Le Chatlier’s principle
Solutions
Solvents and Solutes
Water
Solubility
Solubility and equilibrium
Solubility product
Henry’s Law
Freezing and melting of solutions
Raoult’s Law
Common Ion Effect
Complex Ions
Acids and Bases
Hydronium ions and pH
Equilibrium in water
Strong and weak acids and bases
Equilibrium of weak acids and bases
Acid-base titrations
Buffers
Polyprotic acids and bases
Oxidation and Reduction
Oxidation-Reduction half reactions
Balancing Redox reactions
Redox reactions in acidic and basic solutions
Electrical cells
Standard state potentials
Equilibrium and Nearmst
Electrolysis
Inorganic Chemistry
Crystals
Description of crystal structure
Common unit cells
Non-crystalline solids
Liquids
Surface tension
Phase diagrams
Organic Chemistry
Saturated and unsaturated hydrocarbons
Aromatic compounds

NEW

Chemical Equilibrium
Vapor pressure
Melting and boiling
Gas Phase Equilibrium
Equilibrium and temperature
Le Chatlier’s principle
Solutions
Solvents and Solutes
Water
Solubility
Solubility and equilibrium
Solubility product
Henry’s Law
Freezing and melting of solutions
Raoult’s Law
Common Ion Effect
Complex Ions
Acids and Bases
Hydronium ions and pH
Equilibrium in water
Strong and weak acids and bases
Equilibrium of weak acids and bases
Acid-base titrations
Buffers
Polyprotic acids and bases
Oxidation and Reduction
Oxidation-Reduction half reactions
Balancing Redox reactions
Redox reactions in acidic and basic solutions
Electrical cells
Standard state potentials
Equilibrium and Nearmst
Electrolysis
Inorganic Chemistry
Crystals
Description of crystal structure
Common unit cells
Non-crystalline solids
Liquids
Surface tension
Phase diagrams
Organic Chemistry
Saturated and unsaturated hydrocarbons
Aromatic compounds
Functional groups
Alcohols, Esters, Aldehydes and Ketones
Organic acids and Amines
Biochemistry
Carbohydrates
Lipids
Amino acids and Proteins
Nucleic acids and DNA
Vitamins

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.

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. Chemistry, 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. Chemistry, 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 [x]
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 [x]  (Refer to the Dean’s Office for additional processing)
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>
</tr>
</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>Other</td>
</tr>
<tr>
<td>x Prerequisites/Corequisites</td>
<td>x Reactivate Course</td>
</tr>
<tr>
<td>Catalog description</td>
<td>Grading</td>
</tr>
<tr>
<td>x Mode of Instruction</td>
<td></td>
</tr>
</tbody>
</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.

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**Simone Aloisio**

Proposer(s) of Course Modification

Type in name. Signatures will be collected after Curriculum approval.

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9/29/2009

Date
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.

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