CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS
COURSE MODIFICATION PROPOSAL

Courses must be submitted by November 3, 2008, to make the next catalog (2009-2010) production

DATE (CHANGE DATE EACH TIME REVISED): 10/1/2008 REV 10.20.08

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)

   OLD
   Prefix CHEM Course# 251 Title QUANTITATIVE ANALYSIS LABORATORY
   Units (2)
   6 hours laboratory per week
   Prerequisites: CHEM 122 with a grade of C or better.
   Consent of Instructor Required for Enrollment
   Corequisites: CHEM 250

   Catalog Description (Do not use any symbols):
   A laboratory course designed to provide students with an exposure to the techniques used in the quantification of inorganic, organic, and biological species from samples using gravimetric and volumetric analyses, potentiometric titrations, atomic absorption spectrometry, UV-visible spectroscopy, GC, and GC/MS. Lab fee required.

   NEW
   Prefix CHEM Course# 251 Title QUANTITATIVE ANALYSIS LABORATORY
   Units (1)
   3 hours laboratory per week
   Prerequisites: CHEM 122 with a grade of C or better.
   Consent of Instructor Required for Enrollment
   Corequisites: CHEM 250

   Catalog Description (Do not use any symbols):
   A laboratory course designed to provide students with an exposure to the techniques used in the quantification of inorganic, organic, and biological species from samples using gravimetric and volumetric analyses, potentiometric titrations, atomic absorption spectrometry, UV-visible spectroscopy, GC, and GC/MS. Lab fee required.

   General Education Categories
   Lab Fee Requested
   Course Level:
   Undergraduate
   Post-bac/Credential Graduate

   Graded
   CR/NC
   A - F

   Repeatable
   for up to
   units

   Total Completions

   Multiple
   Enrollment in same semester


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

<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>2</td>
</tr>
<tr>
<td>Activity</td>
<td>2</td>
</tr>
<tr>
<td>Field Studies</td>
<td>2</td>
</tr>
</tbody>
</table>

Hegis Code(s) (Provided by the Dean)
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](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](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
Quantitative Analysis is the study of the analysis of chemical compounds using commonly used laboratory techniques. This course is the laboratory portion that is concurrently taken with the lecture (CHEM 250). These two courses are required for Environmental Science and Resource Management major, whose emphasis is Environmental Science.

NEW
Quantitative Analysis is the study of the analysis of chemical compounds using commonly used laboratory techniques. This course is the lab portion that is concurrently taken with the lecture (CHEM 250). Both are required for all options within the chemistry major. These two courses are required for the Environmental Science Emphasis in the B.S. in Environmental Science and Resource Management major, and for the Clinical Sciences option in the Biology major.

Submit Program Modification if this course changes your program.

5. Learning Objectives. (List in numerical order)

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

- Quantitatively determine the statistical relevance and error of data determined in the chemistry laboratory

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

- Quantitatively determine the statistical relevance and error of data determined in the chemistry laboratory
• Describe the scientific method and how it is used to approach the study of chemical data obtained from the laboratory
• Analyze chemical samples based on commonly used titration methods based on acid-base, solubility, and oxidation-reduction chemistry
• Explain the elements of basic spectroscopic techniques used in chemical analysis
• Evaluate the limitations of analytical techniques based on information obtained by the technique and error associated with the measurement
• Describe the fundamentals behind separation analysis of chemical species
• Identify the latest technology available which uses the fundamentals of the techniques used in laboratory

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

<table>
<thead>
<tr>
<th>OLD</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Quantitative Analysis</td>
<td>Introduction to Quantitative Analysis</td>
</tr>
<tr>
<td>Statistical Analysis and Error in</td>
<td>Statistical Analysis and Error in</td>
</tr>
<tr>
<td>Analytical Data</td>
<td>Analytical Data</td>
</tr>
<tr>
<td>Gravimetric Methods of Analysis</td>
<td>Gravimetric Methods of Analysis</td>
</tr>
<tr>
<td>Titrimetric Methods of Analysis</td>
<td>Titrimetric Methods of Analysis</td>
</tr>
<tr>
<td>Acid-Base Titrations</td>
<td>Acid-Base Titrations</td>
</tr>
<tr>
<td>Complex Formation Titrations</td>
<td>Complex Formation Titrations</td>
</tr>
<tr>
<td>Solubility Equilibria and Precipitation</td>
<td>Solubility Equilibria and Precipitation</td>
</tr>
<tr>
<td>Tittrations</td>
<td>Tittrations</td>
</tr>
<tr>
<td>Oxidation-Reduction Titrations</td>
<td>Oxidation-Reduction Titrations</td>
</tr>
<tr>
<td>Potentiometric Methods of Analysis</td>
<td>Potentiometric Methods of Analysis</td>
</tr>
<tr>
<td>Spectroscopic Techniques</td>
<td>Spectroscopic Techniques</td>
</tr>
<tr>
<td>Spectrophotometry</td>
<td>Spectrophotometry</td>
</tr>
<tr>
<td>Emission Spectroscopy</td>
<td>Emission Spectroscopy</td>
</tr>
<tr>
<td>Separations Solvent Extraction</td>
<td>Separations Solvent Extraction</td>
</tr>
<tr>
<td>Gas-Liquid Chromatography</td>
<td>Gas-Liquid Chromatography</td>
</tr>
<tr>
<td>Liquid Chromatography</td>
<td>Liquid Chromatography</td>
</tr>
</tbody>
</table>

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**
De Levie, R.; Aqueous Acid-Base Equilibria and Titrations, 2000
Weissberger, A.; Rossiter, B.W.; Physical Methods of Chemistry, Vol. 1, 1972

**NEW**
9. Tenure Track Faculty qualified to teach this course.

Simone Aloisio, Phil Hampton, Blake Gillespie

10. Requested Effective Date or First Semester offered: Fall 09

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>
</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>X Units</td>
<td>GE</td>
</tr>
<tr>
<td>Staffing formula and enrollment limits</td>
<td>Other</td>
</tr>
<tr>
<td>Prerequisites/Corequisites</td>
<td>Reactivate Course</td>
</tr>
<tr>
<td>Catalog description</td>
<td></td>
</tr>
<tr>
<td>Mode of Instruction</td>
<td></td>
</tr>
</tbody>
</table>

**Justification:** We are requesting that the courses (CHEM 250 and CHEM 251) become a 3 unit lecture 1 unit lab course. There are two reasons for this. Currently, CHEM 250 and 251 are a 2 unit lecture and 2 unit lab course. With limited teaching lab space and growing enrollment in the course, this is costing the program two lab periods per week. It seems unsustainable to keep this many lab sections per week, and it may not be necessary or as effective as originally thought. We can streamline the lab portion of the course, and have a more traditional one lab per week course. The lecture portion of the course can use the extra hour per week. Currently, there is not enough time and too much material for the two hour per week format. A three hour per week lecture format would allow instructors to spend more time covering the material, and would allow for student problem solving time, which increases the engagement of students in this course. As a quantitative methods in the chemistry program, one can imagine that student engagement should lead to better student success.

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 6, 2008 of preceding year.
Priority deadline for Course Proposals and Modifications: November 3, 2008.
Last day to submit forms to be considered during the current academic year: April 15th.

Simone Aloisio

Proposer(s) of Course Modification

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

10/1/2008

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.

Program Chair

Signature     Date

Program Chair

Signature     Date

Program Chair

Signature     Date

General Education Chair

Signature     Date

Center for Intl Affairs Director

Signature     Date

Center for Integrative Studies Director

Signature     Date

Center for Multicultural Engagement Director

Signature     Date

Center for Civic Engagement and Service Learning Director

Signature     Date

Curriculum Chair

Signature     Date

Dean of Faculty

Signature     Date