

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

COURSE MODIFICATION PROPOSAL

Courses must be submitted by November 5, 2007, to make the next catalog production

DATE (CHANGE DATE IF REVISED): 12.5.07

PROGRAM AREA(S): CHEMISTRY

Directions: All of sections of this form must be completed for course modifications.

1. Catalog Description of the Course.

[Follow accepted catalog format.] (If Cross-listed please submit prefixes for each discipline being modified)

OLD

Prefix CHEM Course# 305 Title Computer Applications In
Chemistry Units (1)
1 hours activity per week
hours blank per week

☐ Prerequisites:

☐ Corequisites:

Description (Do not use any symbols):

This course will introduce the use of computer applications to solve chemical problems and present scientific information. Topics include: on-line journals and literature searches, reading and understanding the scientific literature, computer modeling of molecules, and website development.

☒ Gen Ed
Categories B-4

☒ Lab Fee Required

Graded

☒ CR/NC

☐ Repeatable for
up to

☒ A - F units
☐ Multiple
Optional Enrollment in
(Student's same semester
choice)

☐ American Institutions, Title V Section 40404: ☐ Government ☐ US Constitution ☐ US History (Refer to EO 405, for more information at: <http://senate.csuci.edu/comm/curriculum/resources.htm>)

☐ Service Learning Course

NEW

Prefix CHEM Course# 305 Title Computer Applications in
Chemistry Units (1)
3 hours laboratory per week
hours blank per week

☐ Prerequisites:

☐ Corequisites:

Description:

Introduces the use of computer applications to solve chemical problems and present scientific information. Topics include: on-line journals and literature searches, reading and understanding the scientific literature, computer modeling of molecules, and website development. Lab free required.

☒ Gen Ed
Categories B-4

☒ Lab Fee Required

Graded

☒ CR/NC

☐ Repeatable for
up to

☒ A - F units
☐ Multiple
Optional Enrollment in same
(Student's semester
choice)

2. Mode of instruction (Hours per Unit are defaulted for you)

Hegis Code(s) _____
(Provided by the Dean)

Existing

Proposed

	Units	Hours Per Unit	Benchmark Enrollment	Graded		Units	Hours Per Unit	Benchmark Enrollment	Graded	CS# Units (filled out by Dean)
Lecture	_____	<u>1</u>	_____	☐	Lecture	_____	<u>1</u>	_____	☐	_____
Seminar	_____	<u>1</u>	_____	☐	Seminar	_____	<u>1</u>	_____	☐	_____
Lab	_____	<u>3</u>	_____	☐	Lab	<u>1</u>	<u>3</u>	<u>36</u>	☒	_____
Activity	<u>1</u>	<u>1</u>	<u>36</u>	☐	Activity	_____	<u>1</u>	_____	☐	_____
Field Studies	_____	_____	_____	☐	Field Studies	_____	_____	_____	☐	_____
Indep Study	_____	_____	_____	☐	Indep Study	_____	_____	_____	☐	_____
Other blank	_____	_____	_____	☐	Other blank	_____	_____	_____	☐	_____

3. Course Content in Outline Form if Being Changed. [Be as brief as possible, but use as much space as necessary]

OLD

Calculating and Visualizing Information
Using molecular modeling programs to determine structure
Visualizing chemical information – Chemical Drawing

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Calculating and Visualizing Information
Using molecular modeling programs to determine structure
Visualizing chemical information – Chemical Drawing

Applications
 Spreadsheet and Mathematic programs for sorting through data
 Finding and Interpreting Information
 Chemical Literature
 On-line Journals
 Literature searches using databases
 Reading, Understanding, and Evaluating Literature Articles
 Presenting Information
 ACS format
 Presenting graphs and figures
 Presenting calculations and using Equation Editor
 Proper citation/Endnote use
 Building a web page

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4. Justification and Learning Objectives for the Course. (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

OLD

This course is required Chemistry major, and may be taken by other science majors, who are interested in computer applications as related to chemistry problems for their profession or graduate studies. This course will be an upper-division requirement for chemistry majors, or an elective for the minor in chemistry.

Students who successfully complete this course will be able to:

- Use computer applications to describe molecular shape, electronic structure, thermodynamics, kinetics, and intermolecular interactions
- Compute chemical properties of species using molecular modeling/visualization programs
- Disseminate scientific data using spreadsheets and other mathematical programs designed for this purpose
- Demonstrate the ability to produce professional figures, tables, and graphs using both generalized programs (e.g. Microsoft Word), and ones designed specifically for chemical applications (e.g. ChemDraw)
- Perform literature searches for chemical information using searchable internet databases
- Interpret, discuss, and evaluate a primary literature article
- Construct a basic web-page using basic HTML programming

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- Construct a basic web-page using basic HTML programming

5. References. *[Provide 3-5 references on which this course is based and/or support it.]*

OLD

Dodd, J.S. (ed.) *The ACS Style Guide*, American Chemical Society, 2nd Ed., 1997

Foresman, J.B.; and Frisch, *Æ Exploring Chemistry with Electronic Structure Methods*, Gaussian Inc., 2nd Ed., 1996
 Users manuals for the computer applications used in the course (e.g. Microsoft products, Endnote, Chem Office)

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6. 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.]*

- ☐ Course title
☐ Prefix/suffix
☐ Course number

- ☒ Units
- ☐ Staffing formula and enrollment limits
- ☐ Prerequisites/corequisites
- ☐ Catalog description
- ☐ Course content
- ☐ References
- ☐ GE
- ☐ Other

Justification: This class has been offered on previous occasions in the 1-unit format. However, the 1-unit format is unable to satisfactorily provide enough in-class and contact time given the large breadth and depth of material covered in this course. Inevitably, some of the material must be treated in an unsatisfactory cursory manner to complete all of the course outcomes. Students typically need extensive interactions with the faculty member in all aspects of this class and 1 contact hour has not provided enough opportunity for lengthy interactions. We have changed the format to a one unit lab, providing three contact hours with the students.

7. ☐ **General Education Categories:** All courses with GE categories notations (including deletions) must be processed at 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) ☐

- UD Interdisciplinary ☐

8. **New Resources Required.** YES ☐ NO ☒

If YES, list the resources needed and obtain signatures from the appropriate programs/units on the consultation sheet below.

- a. Computer (data processing), audio visual, broadcasting needs, other equipment)
- b. Library needs
- c. Facility/space needs

9. **Will this course modification alter any degree, credential, certificate, or minor in your program?** YES ☒ NO ☐

If, YES attach a program modification form for all programs affected.

10. **Effective Date (Semester and Year – all modifications submitted prior to November 5th will be effective in the Fall 2008 catalog):** Fall 2008

Blake Gillespie

10/30/2007

Proposer of Course Modification

Date

Request for CHEM 305: Computer Applications in Chemistry to be added to GE Category B4: Computers and Information Technology.

Committee Response:

Approved by committee on 10-31-2007

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*
(not changed) The students will apply computer programs to solve chemical problems. The students will also use the technology to present data, including error bars. By performing molecular modeling calculations, the students will gain an appreciation of scientific methodologies as investigative tools. In presenting data, the student will be able to demonstrate, both symbolically and explicitly, the limitations of these endeavors.
- *Present mathematical or scientific knowledge in a historical perspective and the influences of math and science on the development of world civilizations, both past and present*
(not changed) Students will be using computer applications that are “standard” for the discipline for these types of applications. Past methodologies for achieving the same goal will be discussed. Students will examine a wide range of chemical literature that is influencing the development of world civilization.
- *Apply inductive and deductive reasoning processes and explore fallacies and misconceptions in the mathematical or scientific areas*
(not changed) The students will be exposed to the deductive and inductive reasoning process in their exposure to current scientific literature. The students will also apply these processes in determination of molecular structure calculations. In addition to presenting examples of good scientific reasoning, students will learn to differentiate good reasoning from fallacies, misconceptions and poor reasoning.
- *Include use of computers or information technology to solve problems as appropriate*
(not changed) This course is designed to familiarize the chemistry student with computer applications used in all sub-disciplines of chemistry. The students will be able to apply their acquired skills to a wide variety of scientific problems.

Approval Sheet

Program/Course: CHEM/305

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		
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Signature

Date

Program Chair		
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Signature

Date

Program Chair		
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Signature

Date

General Education Chair		
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Signature

Date

Center for Intl Affairs Director		
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Signature

Date

Center for Integrative Studies Director		
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Signature

Date

Center for Multicultural Learning and Engagement Director		
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Signature

Date

Center for Civic Engagement and Service Learning Director		
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Signature

Date

Curriculum Chair		
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Signature

Date

Dean of Faculty		
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Signature

Date