

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

COURSE MODIFICATION PROPOSAL

Courses must be submitted by October 15, 2013, and finalized by the end of the fall semester to make the next catalog (2014-15) production

DATE (CHANGE DATE EACH TIME REVISED): 10/14/2013; REV 11.13.13

PROGRAM AREA(S): CHEMISTRY

Directions: All of sections of this form must be completed for course modifications. Use **YELLOWED** areas to enter data. All documents are stand alone sources of course information.

1. Indicate Changes and Justification for Each. [Mark an X by all change areas that apply then please follow-up your X's with justification(s) for each marked item. Be as brief as possible but, use as much space as necessary.]

- | | |
|---|---|
| ☐ Course title | ☐ Course Content |
| ☐ Prefix/suffix | ☐ Course Learning Outcomes |
| ☐ Course number | ☐ References |
| ☐ Units | ☐ GE |
| ☐ Staffing formula and enrollment limits | ☐ Other ☐ |
| ☒ Prerequisites/Corequisites | ☐ Reactivate Course |
| ☐ Catalog description | |
| ☒ Mode of Instruction | |

Justification: We want to remove CHEM 305 from all of the pre-requisites that require it. The department decided it was not necessary and hindered student progress towards degree completion. We are standardizing the language on these classes too, for example, removing consent of instructor since this is the case for all classes. Cap adjusted to reflect department practice.

2. Course Information.

[Follow accepted catalog format.] (Add additional prefixes i f cross-listed)

OLD

Prefix CHEM Course# 415
Title **MOLECULAR**
STRUCTURE DETERMINATION Units (4)
3 hours lecture per week
3 hours lab per week

x Prerequisites: CHEM 305 (or concurrent enrollment), CHEM 314, and CHEM 315 or consent of the instructor

☐ Consent of Instructor Required for Enrollment

Corequisites: ☐

Catalog Description (Do not use any symbols):

Examines modern techniques for the determination of the structure of organic and inorganic compounds. Topics include X-ray crystallography, nuclear magnetic resonance spectroscopy, mass spectrometry, infrared spectroscopy, ultraviolet spectroscopy, and molecular modeling.

General Education Categories: ☐

Grading Scheme (Select one below):

x A – F

☐ Credit/No Credit

☐ Optional (Student's Choice)

Repeatable for up to ☐ units

Total Completions ☐

Multiple Enrollment in Same Semester Y/N ☐

Course Level:

x Undergraduate

☐ Post-Baccalaureate

☐ Graduate

NEW

Prefix CHEM Course# 415
Title **MOLECULAR**
STRUCTURE DETERMINATION Units (4)
3 hours lecture per week
3hours lab per week

x Prerequisites: CHEM 314 and CHEM 315 with a grade of C or better.

☐ Consent of Instructor Required for Enrollment

Corequisites: ☐

Catalog Description (Do not use any symbols):

Examines modern techniques for the determination of the structure of organic and inorganic compounds. Topics include X-ray crystallography, nuclear magnetic resonance spectroscopy, mass spectrometry, infrared spectroscopy, ultraviolet spectroscopy, and molecular modeling.

General Education Categories: ☐

Grading Scheme (Select one below):

x A – F

☐ Credit/No Credit

☐ Optional (Student's Choice)

Repeatable for up to ☐ units

Total Completions ☐

Multiple Enrollment in Same Semester Y/N ☐

Course Level:

x Undergraduate

☐ Post-Baccalaureate

☐ Graduate

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

Hegis Code(s) _____

Existing**Proposed**

	Units	Hours Per Unit	Default Section Size	Graded		Units	Hours Per Unit	Default Section Size	Graded	CS No. (filled out by Provost Office)
Lecture	<u>3</u>	<u>1</u>	<u>24</u>	x	Lecture	<u>3</u>	<u>1</u>	<u>36</u>	x	
Seminar		<u>1</u>			Seminar		<u>1</u>			
Lab	<u>1</u>	<u>3</u>	<u>12</u>	x	Lab	<u>1</u>	<u>3</u>	<u>12</u>	x	
Activity		<u>2</u>			Activity		<u>2</u>			
Field Studies					Field Studies					
Indep Study					Indep Study					
Other blank					Other blank					
Online					Online					

4. 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 (Graduation Writing Assessment Requirement)

Meets University Language Requirement

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

Regarding 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).

Online Course (Answer YES if the course is ALWAYS delivered online).

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

OLD

☐

☐ Requirement for the Major/Minor

x ☐ Elective for the Major/Minor

☐ Free Elective

NEW

Elective for the chemistry major.

☐ Requirement for the Major/Minor

x ☐ Elective for the Major/Minor

☐ Free Elective

Submit Program Modification if this course changes your program.

6. **Student Learning Outcomes.** (List in numerical order. Please refer to the Curriculum Committee's "Learning Outcomes" guideline for measurable outcomes that reflect elements of Bloom's Taxonomy: <http://senate.csuci.edu/comm/curriculum/resources.htm>. The committee recommends 4 to 8 student learning outcomes, unless governed by an external agency (e.g., Nursing).

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

OLD

- Outline the development of the field of molecular structure determination.
- Describe how molecular shape can be determined through the use of X-ray crystallographic, spectroscopy (nuclear magnetic resonance, infrared, and ultraviolet spectroscopies), mass spectrometry, and molecular modeling.
- Describe how molecular shape, electronic structure, thermodynamics, kinetics, and intermolecular interactions affect molecular structure.
- Demonstrate the ability to use state-of-the-art scientific instrumentation in the determination of the structure of organic/inorganic and biochemical molecules.
- Compare strengths and limitations of various techniques used to determine molecular structure.
- Describe how the various molecular structure determination techniques and instrumentation work
- Determine the structure of an organic, inorganic, or biological molecule using X-ray crystallography; nuclear magnetic resonance, infrared, and ultraviolet spectroscopies; mass spectrometry; and molecular modeling.
- Interpret, discuss, and evaluate a primary literature article

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

NEW

- Outline the development of the field of molecular structure determination.
- Describe how molecular shape can be determined through the use of X-ray crystallographic, spectroscopy (nuclear magnetic resonance, infrared, and ultraviolet spectroscopies), mass spectrometry, and molecular modeling.
- Describe how molecular shape, electronic structure, thermodynamics, kinetics, and intermolecular interactions affect molecular structure.
- Demonstrate the ability to use state-of-the-art scientific instrumentation in the determination of the structure of organic, inorganic and biochemical molecules.
- Compare strengths and limitations of various techniques used to determine molecular structure.
- Describe how the various molecular structure determination techniques and instrumentation work
- Determine the structure of an organic, inorganic, or biological molecule using X-ray crystallography; nuclear magnetic resonance, infrared, and ultraviolet spectroscopies; mass spectrometry; and molecular modeling.
- Interpret, discuss, and evaluate a primary literature article

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

OLD

Molecular Modeling Conformational Equilibria X-ray Crystallography Proton NMR Carbon NMR Other Nuclei NMR Correlation NMR Dynamic NMR Nuclear Overhauser Effect Mass Spectrometry Infrared Spectroscopy Ultraviolet and Chiroptical Spectroscopy

NEW

Molecular Modeling Conformational Equilibria X-ray Crystallography Proton NMR Carbon NMR Other Nuclei NMR Correlation NMR Dynamic NMR Nuclear Overhauser Effect Mass Spectrometry Infrared Spectroscopy Ultraviolet and Chiroptical Spectroscopy

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.

8. **Cross-listed Courses (Please note each prefix in item No. 1)** Beyond three disciplines consult with the Curriculum Committee.

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: ☐

9. **References.** [Provide 3-5 references]

OLD Simpson, J. H. *Organic Structure Determination: Using 2D NMR Spectroscopy*, Elsevier, 2008. Neil E. Jacobsen, *NMR Spectroscopy Explained*, Wiley, 2007 Silverstein, R. M.; Webster, F. X.; Kiemle, D. J. *Spectrophotometric Identification of Organic Compounds*, Seventh Ed., Wiley, 2005.
Crews, P.; Rodriguez, J.; Jaspars, M. *Organic Structure Analysis, Topics in Organic Chemistry*, Oxford University Press, 1998. st
Lambert, J.B.; Shurvell, H.F.; Lightner, D.A.; Cooks, R.G. *Organic Structural Spectroscopy*, MacMillan, 1 Ed, 1997.

NEW Simpson, J. H. *Organic Structure Determination: Using 2D NMR Spectroscopy*, Elsevier, 2008. Neil E. Jacobsen, *NMR Spectroscopy Explained*, Wiley, 2007 Silverstein, R. M.; Webster, F. X.; Kiemle, D. J. *Spectrophotometric Identification of Organic Compounds*, Seventh Ed., Wiley, 2005.
Crews, P.; Rodriguez, J.; Jaspars, M. *Organic Structure Analysis, Topics in Organic Chemistry*, Oxford University Press, 1998. st
Lambert, J.B.; Shurvell, H.F.; Lightner, D.A.; Cooks, R.G. *Organic Structural Spectroscopy*, MacMillan, 1 Ed, 1997.

10. Tenure Track Faculty qualified to teach this course.
GILLESPIE, HAMPTON

11. Requested Effective Date or First Semester offered: Fall 2014

12. 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 ☐ (Lab fee requests should be directed to the Student Fee Committee)

E. Other. ☐

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 1, 2013** of preceding year.
Priority deadline for Course Proposals and Modifications: **October 15, 2013**.
Last day to submit forms to be considered during the current academic year: **April 15th**.

Simone Aloisio

10/14/2013

Proposer(s) of Course Modification

Date

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

Approval Sheet

Course: [REDACTED]

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.

The CI program review process includes a report from the respective department/program on its progress toward accessibility requirement compliance. By signing below, I acknowledge the importance of incorporating accessibility in course design.

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
AVP		
Signature		Date