

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.]

<input type="checkbox"/> Course title	<input type="checkbox"/> Course Content
<input type="checkbox"/> Prefix/suffix	<input type="checkbox"/> Course Learning Outcomes
<input type="checkbox"/> Course number	<input type="checkbox"/> References
<input type="checkbox"/> Units	<input type="checkbox"/> GE
<input type="checkbox"/> Staffing formula and enrollment limits	<input type="checkbox"/> Other <input type="checkbox"/>
<input checked="" type="checkbox"/> Prerequisites/Corequisites	<input type="checkbox"/> Reactivate Course
<input type="checkbox"/> Catalog description	
<input checked="" type="checkbox"/> 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 changed to reflect department practice.

2. Course Information.

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

OLD

Prefix CHEM Course# 465
 Title **BIOINORGANIC CHEMISTRY** Units (4)
 3 hours lecture per week
 3 hours lab per week

x Prerequisites: CHEM 305 (or concurrent enrollment), and CHEM 314 with a grade of C or better or consent of the instructor.

☐ Consent of Instructor Required for Enrollment
 Corequisites: ☐

Catalog Description (Do not use any symbols):

☐

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# 465
 Title **BIOINORGANIC CHEMISTRY** Units (4)
 3 hours lecture per week

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

☐ Consent of Instructor Required for Enrollment
 Corequisites: ☐

Catalog Description (Do not use any symbols):

☐

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>36</u>	x	Lecture	<u>3</u>	<u>1</u>	<u>36</u>	xaloi	
Seminar		<u>1</u>			Seminar		<u>1</u>			
Lab	<u>1</u>	<u>3</u>	<u>18</u>	x	Lab	<u>1</u>	<u>3</u>	<u>12</u>		
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

This course is an elective to be taken by chemistry majors. Bioinorganic chemistry builds on the student's background in chemical biology by exploring in-depth the metallochemistry critical to many aspects of biomolecular function. Students completing this course will be particularly well suited for graduate studies in biochemistry, biophysics and biomaterials engineering.

☐ Requirement for the Major/Minor
☒ Elective for the Major/Minor
☐ Free Elective

NEW

This course is an elective to be taken by chemistry majors. Bioinorganic chemistry builds on the student's background in chemical biology by exploring in-depth the metallochemistry critical to many aspects of biomolecular function. Students completing this course will be particularly well suited for graduate studies in biochemistry, biophysics and biomaterials engineering.

☐ Requirement for the Major/Minor
☒ 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

- Explain the general state of the field of bioinorganic chemistry.
- Describe the elements of metal coordination chemistry as applied to biomolecular structure and function.
- Describe how molecular shape, electronic structure, thermodynamics, kinetics, and intermolecular interactions affect the structure, properties, and reactions of bioinorganic systems.
- Explain the role of metals in electron transfer and redox catalysis.
- Integrate their knowledge of bioinorganic chemistry with their broader knowledge of chemistry and biology.
- Interpret, discuss, and evaluate a primary literature article

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- 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

Introduction

Protein structure Enzyme mechanisms Electron transfer

Coordination chemistry in bioinorganic reactions

Thermodynamics: acid/base concepts, chelation, pK_a, geometries

Kinetics: ligand exchange, reactions mechanisms

Ligand-field theory

Principles and systems

Biological ligands

Proteins Nucleic acids Coenzymes

Metal uptake, and storage and in biology

Membranes Concentration gradients Solubilization of ions

Storage of ions

Structural role of metals in biology Transport and storage of metals in biology

Oxygen transport and storage

Catalytic roles of metal ions in biology

Electron carriers

Electron transport and respiration

Key examples in bioinorganic reactions

Activation of dioxygen: iron Photosynthesis: magnesium and manganese Superoxide dismutases: copper and nickel Carbonic anhydrase: zinc

Pharmaceutical Chemistry of Metals

NEW

Introduction

Protein structure Enzyme mechanisms Electron transfer

Coordination chemistry in bioinorganic reactions

Thermodynamics: acid/base concepts, chelation, pK_a, geometries

Kinetics: ligand exchange, reactions mechanisms

Ligand-field theory

Principles and systems

Biological ligands

Proteins Nucleic acids Coenzymes

Metal uptake, and storage and in biology

Membranes Concentration gradients Solubilization of ions

Storage of ions

Structural role of metals in biology Transport and storage of metals in biology

Oxygen transport and storage

Catalytic roles of metal ions in biology

Electron carriers

Electron transport and respiration

Key examples in bioinorganic reactions

Activation of dioxygen: iron Photosynthesis: magnesium and manganese Superoxide dismutases: copper and nickel Carbonic anhydrase: zinc

Pharmaceutical Chemistry of Metals

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.

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 Bertini, I.; Gray, H.B.; Lippard, S.J.; Valentine, J.S. *Bioinorganic Chemistry*, Springer-Verlag, 1994 Lippard, S.J.; Berg, J.M.; *Principles of Bioinorganic Chemistry*, Wiley, 1994 Roat-Malone, R.M. *Bioinorganic Chemistry: A Short Course*, Wiley, 2002

NEW Bertini, I.; Gray, H.B.; Lippard, S.J.; Valentine, J.S. *Bioinorganic Chemistry*, Springer-Verlag, 1994 Lippard, S.J.; Berg, J.M.; *Principles of Bioinorganic Chemistry*, Wiley, 1994 Roat-Malone, R.M. *Bioinorganic Chemistry: A Short Course*, Wiley, 2002

10. Tenure Track Faculty qualified to teach this course.

GILLESPIE

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