

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): CHEM

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: Modified CHEM 462 has a new number, since 461 will become Biochemistry I lab. CHEM 462 will also separate classroom and lab component, allowing for greater flexibility on the part of the students. Classroom and laboratory content for the modified CHEM 462. And the new lab class, CHEM 463, will consist of the same lab content as the original CHEM 461. Removes the pre-requisite course CHEM 305, Computer applications in Chemistry, as unnecessary for CHEM 462. Catalog description altered to remove reference to lab fee.

2. Course Information.

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

OLD

Prefix CHEM Course# 461
Title Biochemistry II Units (4)
3 hours lecture per week
3 hours lab per week

☒ Prerequisites: CHEM305, CHEM 460
☐ Consent of Instructor Required for Enrollment
Corequisites: ☐

Catalog Description (Do not use any symbols):

This course will focus on the biochemical reactions that occur in cells. Topics include biosynthesis of proteins, lipids and nucleic acids, photosynthesis, cellular metabolism, and gene expression.

Lab fee required.

General Education Categories: ☐
Grading Scheme (Select one below):
☐ 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:
☒ Undergraduate
☐ Post-Baccalaureate
☐ Graduate

NEW

Prefix CHEM Course# 462
Title Biochemistry II Units **(3)**
3 hours lecture per week
☐ hours blank per week

☒ Prerequisites: CHEM 460
☐ Consent of Instructor Required for Enrollment
Corequisites: ☐

Catalog Description (Do not use any symbols):

Focuses on the biochemical reactions that occur in cells. Topics include biosynthesis of proteins, lipids and nucleic acids, photosynthesis, cellular metabolism, and gene expression. Effective F2014, CHEM 461 changes to CHEM 462.

General Education Categories: ☐
Grading Scheme (Select one below):
☒ 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:
☒ Undergraduate
☐ Post-Baccalaureate
☐ Graduate

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

Hegis Code(s) _____
(Provided by the Provost Office)

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>24</u>	X	
Seminar		<u>1</u>			Seminar		<u>1</u>			
Lab	<u>1</u>	<u>3</u>	<u>12</u>	X	Lab		<u>3</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 a continuation of CHEM 460 and is a requirement for chemistry majors pursuing a biochemistry option. Additionally, all students interested in pursuing medical, veterinary, dental or pharmacology school, or graduate studies in biochemistry will find this course helpful for admission into a competitive program

☐ Requirement for the Major/Minor

☒ Elective for the Major/Minor

☐ Free Elective

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☐ 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

Students who successfully complete this course will be able to:

- Outline the development of the field of biochemistry from historical benchmarks to the most current examples of biotechnology's impact on medicine and society.
- Describe how molecular shape, electronic structure, thermodynamics, kinetics, and intermolecular interactions affect the structure, properties, and reactions of biological molecules.
- Explain the overall schema of metabolic strategy, regulation and disease.
- Describe major biochemical pathways, including energy flow, anabolic and catabolic pathways.
- Explain the regulatory mechanisms of these pathways.
- Integrate their general knowledge of biomolecular structure, function and metabolism with important biological and medical questions, such as immune responses, carcinogenesis, and signal transduction.
- Interpret, discuss, and evaluate a primary literature article

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

OLD

☐ Introduction to Metabolism

Energy content of molecules and thermodynamics

Oxidation-reduction reactions and electrochemistry

Regulatory strategies in metabolism

Glycolysis and Gluconeogenesis

Energy conversion

Gluconeogenesis

Regulation of glycolysis

Citric Acid Cycle

Enzymes in the Citric Acid Cycle

Regulation of the Citric Acid Cycle

Electron-Transport and Oxidative Phosphorylation

Electron-transport

Oxidative phosphorylation and regulation

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Introduction to Metabolism

Energy content of molecules and thermodynamics

Oxidation-reduction reactions and electrochemistry

Regulatory strategies in metabolism

Glycolysis and Gluconeogenesis

Energy conversion

Gluconeogenesis

Regulation of glycolysis

Citric Acid Cycle

Enzymes in the Citric Acid Cycle

Regulation of the Citric Acid Cycle

Electron-Transport and Oxidative Phosphorylation

Electron-transport

Oxidative phosphorylation and regulation

Photosynthesis
 Light reactions and biosynthesis of ATP
 Dark reactions, the Calvin Cycle and the Pentose Phosphate Pathway
 Lipid Metabolism
 Fatty acid synthesis and degradation
 Regulation of fatty acid synthesis and degradation
 Membrane lipid synthesis
 Amino and Nucleic Acid Metabolism
 Protein degradation
 Synthesis and degradation of amino acids
 Nucleic Acid Metabolism
 Purine biosynthesis and regulation
 Pyrimidine biosynthesis and regulation
 The control of gene expression
 Structure of genes in pro- and eukaryotes
 Activation and repression of transcription
 Chromatin structure
 Post-transcriptional regulation
 Responding to stimuli
 Olfaction and vision
 The immune response
 Molecular motors

Photosynthesis
 Light reactions and biosynthesis of ATP
 Dark reactions, the Calvin Cycle and the Pentose Phosphate Pathway
 Lipid Metabolism
 Fatty acid synthesis and degradation
 Regulation of fatty acid synthesis and degradation
 Membrane lipid synthesis
 Amino and Nucleic Acid Metabolism
 Protein degradation
 Synthesis and degradation of amino acids
 Nucleic Acid Metabolism
 Purine biosynthesis and regulation
 Pyrimidine biosynthesis and regulation
 The control of gene expression
 Structure of genes in pro- and eukaryotes
 Activation and repression of transcription
 Chromatin structure
 Post-transcriptional regulation
 Responding to stimuli
 Olfaction and vision
 The immune response
 Molecular motors

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

Berg, J.M.; Tymoczko, J.L.; Stryer, L. *Biochemistry*, Freeman, 5th Ed., 2002
 Gilbert, H. F. *Basic Concepts in Biochemistry- A Student's Survival Guide*, McGraw-Hill, 2nd Ed., 2000
 Nelson, D. L.; Cox, M. M. *Lehninger, Principles of Biochemistry*, Worth, 3rd Ed., 2000
 Stryer, L. *Biochemistry*, Freeman, 4th Ed., 1995
 Voet, D.; Voet, J. G.; Pratt, C. W. *Fundamentals of Biochemistry*, Wiley, 1st Ed., 2002

NEW

Berg, J.M.; Tymoczko, J.L.; Stryer, L. *Biochemistry*, Freeman, 5th Ed., 2002
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 Nelson, D. L.; Cox, M. M. *Lehninger, Principles of Biochemistry*, Worth, 3rd Ed., 2000
 Stryer, L. *Biochemistry*, Freeman, 4th Ed., 1995
 Voet, D.; Voet, J. G.; Pratt, C. W. *Fundamentals of Biochemistry*, Wiley, 1st Ed., 2002

10. Tenure Track Faculty qualified to teach this course.
 Blake Gillespie

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

12. 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 ☐ (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 x 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.

☐

☐

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