CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS
COURSE MODIFICATION PROPOSAL
Courses must be submitted by November 2, 2009, to make the next catalog (2010--2011) production

DATE (CHANGE DATE EACH TIME REVISED): 10-15-09; REV 12.8.09

PROGRAM AREA(S): BIOLOGY
Directions: All 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 BIOL Course# 505 Title MOLECULAR STRUCTURE
Units (4)
3 hours lecture per week
3 hours blank per week

Prerequisites: BIOL 400 or permission of instructor
Consent of Instructor Required for Enrollment
Corequisites: 

Catalog Description (Do not use any symbols): This course will examine the structural biology of proteins. Topics include general principles of protein structure, the biochemical function of proteins, the relationship of protein structure to its function and experimental approaches to determining and predicting protein structure and function.

Graded General Education Categories Lab Fee Requested
CR/NC Repeatable for up to units
Multiple Enrollments
Undergraduate Optional (Student’s choice)
Graduate 

NEW

Prefix BIOL Course# 505 Title MOLECULAR STRUCTURE
Units (4)
3 hours lecture per week
3 hours blank per week

Prerequisites: BIOL 504
Consent of Instructor Required for Enrollment
Corequisites: 

Catalog Description (Do not use any symbols): Examines the structural biology of proteins. Topics include general principles of protein structure, the biochemical function of proteins, the relationship of protein structure to its function and experimental approaches to determining and predicting protein structure and function.

Graded General Education Categories Lab Fee Requested
CR/NC Repeatable for up to units
Multiple Enrollments
Undergraduate Optional (Student’s choice)
Graduate 

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

<table>
<thead>
<tr>
<th>Existing</th>
<th>Proposed</th>
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<tbody>
<tr>
<td><strong>Units</strong></td>
<td><strong>Hours Per Unit</strong></td>
</tr>
<tr>
<td>Lecture</td>
<td>3</td>
</tr>
<tr>
<td>Seminar</td>
<td>1</td>
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<tr>
<td>Lab</td>
<td>1</td>
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<tr>
<td>Activity</td>
<td>2</td>
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<tr>
<td>Field Studies</td>
<td></td>
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<tr>
<td>Indep Study</td>
<td></td>
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<tr>
<td>Other blank</td>
<td></td>
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</tbody>
</table>

| Units | Hours Per Unit | Benchmark Enrollment | Graded |
| Lecture | 3 | 1 | 15 | x |
| Seminar | 1 | 1 | | |
| Lab | 1 | 2 | 15 | x |
| Activity | | | | |
| Field Studies | | | | |
| Indep Study | | | | |
| Other blank | | | | |

3. Course Attributes:

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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
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

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
Molecular structure is a required course for graduate students in the Professional Master of Science Degree Program in Bioinformatics (Biotecnology emphasis).

NEW
Molecular structure is a required course for graduate students in the Biotechnology Emphasis of the Professional Master of Science Degree Program in Biotechnology and Bioinformatics. It is an elective course for the other emphases of the program.

- Requirement for the Major/Minor
- Elective for the Major/Minor
- Free Elective

Submit Program Modification if this course changes your program.

5. Learning Objectives. (List in numerical order. You may wish to visit resource information at the following website: http://senate.csuci.edu/comm/curriculum/resources.htm)

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

OLD
• Describe basic principles of protein structure including protein structure motifs, properties of alpha helices and beta sheets and protein folding.
• Explain how a protein’s conformation determines its biochemical activity.
• Describe how a protein’s structure enables binding to other molecules.
• Explain how a protein’s function can be deduced from its primary structure.
• Describe the techniques used for solving the 3-D structure of a protein.

NEW
• Describe and analyze basic principles of protein structure including protein structure motifs, properties of alpha helices and beta sheets and protein folding.
• Examine how a protein’s conformation determines its biochemical activity.
• Describe and analyze how a protein’s structure enables binding to other molecules.
• Explain and analyze how a protein’s function can be deduced from its primary structure.
• Describe and apply the techniques used for solving the 3-D structure of a protein.

6. Course Content in Outline Form. (Be as brief as possible, but use as much space as necessary)
OLD
I. Protein Sequence and Structure
   Primary structure
   Secondary Structure
   Properties of the Alpha Helix and Beta sheet
   Prediction of Secondary Structure
   Tertiary Structure
   Membrane Protein Structure
   Protein Stability
   The Protein Domain
   Protein Motifs
   Quaternary Structure

II. Protein Structure and Function
   The Structural Basis of Protein Function
   Recognition, Complementarity and Active Sites
   Flexibility and Protein Function
   Location and nature of Binding Sites
   Functional Properties of Structural Proteins
   Catalysis
   Multifunctional Enzymes

III. Deducing protein function from Sequence
   Sequence Alignment and Comparison
   Protein Profiling
   Experimental Tools for Probing Protein Function
   Divergent and Convergent Evolution
   Protein Superfamilies
   Strategies for Identifying Binding Sites
   Strategies for Identifying Catalytic Residues

IV. Protein Structure Determination
   The Interpretation of Structural Information
   Structure Determination by X-Ray Crystallography and NMR
   Quality and Representation of Crystal and NMR Structures

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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
NEW

9. Tenure Track Faculty qualified to teach this course.

Biology faculty

10. Requested Effective Date or First Semester offered: W 2009

11. 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 □ (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.]

[Course title □ Prefix/suffix □ Course number □ Units □ Staffing formula and enrollment limits □ Prerequisites/Corequisites □ Catalog description □ Mode of Instruction □ Course Content □ Course Learning Objectives □ References □ GE □ Other □ Reactivate Course □]

Justification: Since BIOL 504 is a foundation course for the MS Biotechnology and Bioinformatics program, students are advised to take BIOL 504 early on during their program of study and then take other required and elective courses. However, in the last few years of offering the program, we realized that some students have postponed taking BIOL 504, sometimes to the last term. To make sure students complete their foundation course first, BIOL 504 is included as a prerequisite course for BIOL 505, which requires the knowledge of 504 for students to succeed.

13. Will this course modification alter any degree, credential, certificate, or minor in your program? Yes □ No X
If YES attach a program update or program modification form for all programs affected.
Priority deadline for New Minors and Programs: October 5, 2009 of preceding year.
Priority deadline for Course Proposals and Modifications: November 2, 2009.
Last day to submit forms to be considered during the current academic year: April 15th.

Ching-Hua Wang 10-15-09
Proposer(s) of Course Modification Date
Type in name. Signatures will be collected after Curriculum approval.
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.

<table>
<thead>
<tr>
<th>Chair Name</th>
<th>Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Program Chair</td>
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<td>General Education Chair</td>
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<tr>
<td>Center for Intl Affairs Director</td>
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<td>Center for Multicultural Engagement Director</td>
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<td>Center for Civic Engagement and Service Learning Director</td>
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<td>Curriculum Chair</td>
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<tr>
<td>Dean of Faculty</td>
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