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 2.10.10

PROGRAM AREA(S): BIOLOGY

Directions: All of sections of this form must be completed for course modifications. All documents are stand alone sources of course information.

1. Course Information.

General Education

Lab Fee Requested

Post-bac/Credential

Categories

Course Level: Undergraduate

Graduate

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

NEW OLD Prefix **BIOL** Course# 502 Title TECHNIQUES IN Prefix **BIOL** Course# 502 Title TECHNIQUES IN GENOMICS/PROTEOMICS Units (3) GENOMICS/PROTEOMICS Units (3) 1 hours lecture per week 1 hours lecture per week 6 hours blank per week 6 hours blank per week x Prerequisites: BIOL 401 x Prerequisites: BIOL 400, 401 or 501

x Consent of Instructor Required for Enrollment Corequisites:

Catalog Description (Do not use any symbols): Provides students with theoretical foundations and practial skills needed for general bioinformatics, genomics, and proteomics analysis. Intensive lab sessions, emphasize applied techniques. Field trips to various local biotechnology facilities will augment the training. Graded

CR/NC

x A - F

Optional

choice)

(Student's

x Consent of Instructor Required for Enrollment Corequisites:

Catalog Description (Do not use any symbols): Provides students with theoretical foundations and practial skills needed for general bioinformatics, genomics, and proteomics analysis. Intensive lab sessions, emphasize applied techniques. Field trips to various local biotechnology facilities will augment the training.



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



3. Course Attributes:

General Education Categories: All courses with GE category notations (including deletions) must be submitted to the GE website: <u>http://summit.csuci.edu/geapproval</u>. 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

This course is a required course for the MS in Biotechnology and Bioinformatics degree program. The course will familiarize students with techniques used in the fields of modern genomics and proteomics. The course actively explores basic biology in the context of applied research and provides students the opportunity to conduct pertinent experiments and analyze the results by a variety of techniques.

x Requirement for the Major/Minor Elective for the Major/Minor

Free Elective **Submit Program Modification if this course changes your program.**

NEW

This course is a required course for the MS in Biotechnology and Bioinformatics degree program. The course will familiarize students with techniques used in the fields of modern genomics and proteomics. The course actively explores basic biology in the context of applied research and provides students the opportunity to conduct pertinent experiments and analyze the results by a variety of techniques.

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

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**

Utilize the concepts of genomics and proteomics toward biotechnological applications

- Demonstrate their ability to reason both inductively and deductively with experimental information and data.
- Explain the theory and practice of a variety of experimental techniques.

Select and apply experimental procedures to the spectrum of fields making use of biotechnology

Design strategies for successful experimentation

- Upon completion of the course, the student will be able to: **NEW**
- Utilize the concepts of genomics and proteomics toward biotechnological applications
- Demonstrate their ability to reason both inductively and deductively with experimental information and data.
- Explain the theory and practice of a variety of experimental techniques.
- Select and apply experimental procedures to the spectrum of fields making use of biotechnology

Design strategies for successful experimentation

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

The entire course will focus on three modules: 1. Detection of protein-protein interactions: This will involve elements such as primer design, gene cloning, PCR, mammalian cell culture and affinity chromatography. 2. Gene silencing by RNA interference: This will involve mammalian cell cultures, gene silencing by siRNAs, northern and western blots, SDS-PAGE, RT-PCR and fluorescence microscopy.

3. Random mutagenesis and protein purification: This will involve synthesis of megaprimers, gene cloning, protein expression and purification using affinity columns. The entire course will focus on three modules: 1. Detection of protein-protein interactions: This will involve elements such as primer design, gene cloning, PCR, mammalian cell culture and affinity chromatography. 2. Gene silencing by RNA interference: This will involve mammalian cell cultures, gene silencing by siRNAs, northern and western blots, SDS-PAGE, RT-PCR and fluorescence microscopy.

3. Random mutagenesis and protein purification: This will involve synthesis of megaprimers, gene cloning, protein expression and purification using affinity columns.

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 1. "Discovering Genomics, Proteomics and Bioinformatics", 2nd edition, by A. Malcolm Campbell and Laurie J. Heyer; Publisher: Benjamin Cummings; ISBN-10: 0805382194 ; ISBN-13: 9780805382198

- 2. RNA Interference in Practice: Principles, Basics, and Methods for Gene Silencing in C.elegans, Drosophila, and Mammals (Hardcover) by Ute Schepers. Wiley-VCH; 1 edition (2005)
- 3. The Tandem Affinity Purification (TAP) Method: A General Procedure of Protein Complex Purification
- Oscar Puig et al. Methods, Vol 24 (3): 218-229 (2001)

4. EZ cloning. Strategies, Vol 20 (2). Stratagene

NEW 1. "Discovering Genomics, Proteomics and Bioinformatics", 2nd edition, by A. Malcolm Campbell and Laurie J. Heyer; Publisher: Benjamin Cummings; ISBN-10: 0805382194 ; ISBN-13: 9780805382198 2. RNA Interference in Practice: Principles, Basics, and Methods for Gene Silencing in C.elegans, Drosophila, and Mammals (Hardcover) by Ute Schepers. Wiley-VCH; 1 edition (2005)

3. The Tandem Affinity Purification (TAP) Method: A General Procedure of Protein Complex Purification

Oscar Puig et al. Methods, Vol 24 (3): 218-229 (2001)

4. EZ cloning. Strategies, Vol 20 (2). Stratagene

- 9. Tenure Track Faculty qualified to teach this course. Biology faculty
- 10. Requested Effective Date or First Semester offered: Summer 2010
- 11. New Resource Requested: Yes <u>No x</u> 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 x Prerequisites/Corequisites Catalog description

Mode of Instruction

Course Content Course Learning Objectives References GE Other Reactivate Course

Justification: BIOL 502 is a required course for the MS Biotechnology and Bioinformatics Program. The experiences gained by the faculty members teaching this course have informed the program that students need to have a solid background in molecular biology in order to succeed in BIOL 502. Previously, we included BIOL 401, a molecular biology techniques course, as the prerequisite for this course. Unless students had graduated from an undergraduate program in molecular biology, often times, they would not have had BIOL 401 or an equivalent course. Including BIOL 400 Molecular Biology, a theory and techniques course, and BIOL 501, which combines cell biology and molecular biology, will allow those students who have had a molecular biology background by taking any of the prerequisite or equivalent courses to enroll in BIOL 502 and will guide those who have not met the prerequisite to complete the course before they are allowed to enroll in BIOL 502.

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

Proposer(s) of Course Modification Type in name. Signatures will be collected after Curriculum approval. Date

10-15-09

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.

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		
	Signature	Date
Center for Multicultural Engagement Director		
	Signature	Date
Center for Civic Engagement and Service Learning Director		
	Signature	Date
Curriculum Chair		
	Signature	Date
Dean of Faculty		
	Signature	Date

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