California State University Channel Islands

NEW COURSE PROPOSAL

Courses must be submitted by November 2, 2009, for priority catalog review.

DATE (*Change if modified and redate file with current date)*) 9-22-09; REV 12.7.09
PROGRAM AREA(S) BIOLOGY

1. Course Information. *[Follow accepted catalog format.]*

Prefix(es) (Add additional prefixes if cross-listed) **and Course No. BME 500**
Title: Biological Systems, Biomechanics and Biorobotics **Units: 3**

x Prerequisites BIOL 210 and 211 or BIOL 424; PHYS 200 and 201 or BIOL/PHYS 315; and BIOL 300 or CHEM 318 or CHEM 460; and BIOL 400 or BIOL 501

Corequisites

Consent of Instructor Required for Enrollment

Catalog Description (Do not use any symbols): **C**overs structural and physiological foundations in biomedical engineering, including molecular and cellular, cardiovascular, musculoskeletal and neural systems, and principles and applications of biomechanics and biorobotics in biological systems.

Grading Scheme:

x A-F Grades
Credit/No Credit
Optional (Student Choice)

Repeatability:

Repeatable for a maximum of units
Total Completions Allowed
Multiple Enrollment in Same Semester

Course Level Information:

Undergraduate
Post-Baccalaureate/Credential
x Graduate

Mode of Instruction/Components (*Hours per Unit are defaulted*).

	Units	Hours per Unit	Benchmark Enrollment	Graded Component	CS & HEGIS # (Filled in by the Dean)
Lecture	2	1	24	x	
Seminar		1			
Laboratory	1	3	24	x	
Activity		2			
Field Studies					
Indep Study					
Other Blank					

Leave the following hours per week areas blank. The hours per week will be filled out for you.
2 hours lecture per week
3 hours laboratory per week

2. 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
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).

3. Justification and Requirements for the Course. (Make a brief statement to justify the need for the course)

A. Justification: This is a required course for the MS Biotechnology with an Emphasis in Biomedical Engineering program.

B. Degree Requirement:
x Requirement for the Major/Minor
Elective for the Major/Minor
Free Elective

Note: Submit Program Modification if this course changes your program.

4. Learning Objectives. (*List in numerical order. You may wish to use the following resource in utilizing measurable verbs: http://senate.csuci.edu/comm/curriculum/resources.htm*)

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

- Demonstrate an understanding of biological bases of biomechanics and biorobotics
- Illustrate and apply principles of biomechanics of human movement
- Summarize robotic procedures utilized in medicine

5. Course Content in Outline Form. *[Be as brief as possible, but use as much space as necessary]*

Review of human anatomy and physiology at organ, tissue, cellular and molecular levels
Mechanical bases, linear, angular, and fluid
Biomechanics of human movement and the musculoskeletal system
Biomechanics in sports medicine and rehabilitation
Neurological consideration of human movement
Robotic procedures in medicine

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.

6. 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).
List each cross-listed prefix for the course:

B. Program responsible for staffing: Biology

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

- Fundamentals of Biomechanics by Duane Knudson, Springer; 2nd edition, 2007, ISBN-10: 0387493115
- Introductory Biomechanics: From Cells to Organisms (Cambridge Texts in Biomedical Engineering) by C. Ross Ethier and Craig A. Simmons , Cambridge University Press; 1 edition, 2007, ISBN-10: 0521841127
- Biomechanical Basis of Human Movement by Joseph Hamill and Kathleen M Knutzen,Publisher: Lippincott Williams & Wilkins; Third Edition edition, 2008, ISBN-10: 0781791286
- The Future of Medicine: Megatrends in Health Care That Will Improve Your Quality of Life, by Stephen C. Schimpff. Publisher: Thomas Nelson; 1 edition, 2007, ISBN-10: 0785221719
- Engineering Approaches to Mechanical and Robotic Design for Minimally Invasive Surgeries by Ali Faraz and Shahram Payandeh, Publisher: Springer; 1 edition, 2000, ISBN-10: 0792377923
- Urologic Robotic Surgery, by Jeffrey A. Stock, Michael P. Esposito and Vincent Lanteri, Publisher: Humana Press; 1 edition, 2008, ISBN-10: 1588296156

8. Tenure Track Faculty Qualified to Teach This Course.

Biology faculty

9. Requested Effective Date:
First semester offered: F2010

10. New Resources 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 (please refer to Dean's Office for additional processing) **Yes** **No** x

E. Other

11. Will this new course 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 5, 2009 of preceding year.
Priority deadline for Course Proposals and Modifications: November 2, 2009, of preceding year.
Last day to submit forms to be considered during the current academic year: April 15th.

Ching-Hua Wang 9/30/09

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

Approval Sheet

Program/Course: Biology BME 500
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 International Affairs Director		
	Signature	Date
Center for Integrative Studies Director		
	Signature	Date
Center for Multicultural Engagement Director		
	Signature	Date
Center for Civic Engagement Director		
	Signature	Date
Curriculum Chair		
	Signature	Date
Dean of Faculty		
	Signature	Date