CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

DATE 11.16.06
PROGRAM AREA BIOLOGY

1. Catalog Description of the Course. *[Follow accepted catalog format.]*

Prefix BIOL Course# 408 Title : NANOBIOTECHNOLOGY Units (3)
3 hours lecture per week
0 hours laboratory per week
☒ Prerequisites BIOL400
☐ Corequisites
Description This course presents the basis of foundation for understanding how macromolecules combine to form the structural and functional units of the intact cell.

Graded
☐ Gen Ed ☐ CR/NC ☐ Repeatable for up to units
Categories
☐ Lab Fee Required ☒ A - F Total Completions Allowed
☐ Optional (Student's choice) ☐ Multiple Enrollment in same semester
☐ Title V Section 40404: ☐ Government ☐ US Constitution ☐ US History

2. Mode of Instruction.

	Units	Hours per Unit	Benchmark Enrollment	Graded Component	CS & HEGIS # (filled in by Dean)
Lecture	3	1	30	☒	
Seminar				☐	
Laboratory				☐	
Activity				☐	

3. Justification and Learning Objectives for the Course. (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*
Nanobiotechnology is a rapidly advancing area of scientific and technological opportunity that applies the tools and processes of nano/microfabrication to build devices for studying biosystems. This course is an elective course for the Biology degree programs.

Learning Outcomes: Upon successful completion of this course, students will be able to:
1. Understand the essential features of biology and nanotechnology that are converging to create the new area of nanobiotechnology.
2. Characterize the behavior of molecules and molecular systems
3. Demonstrate knowledge of nano-biotechnological systems and devices
4. Perform basic calculations of the behavior of nano-bio systems
5. Read, explain, and discuss scientific papers in the nanobiotechnology field.
6. Give an oral presentation based on the scientific literature from the nanobiotechnology field.

4. Is this a General Education Course YES ☐ NO ☒
If Yes, indicate GE category and attach GE Criteria Form:

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) ☐
UD Interdisciplinary ☐

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

1. Introduction to macromolecules as nanomachines (Lipids, proteins, DNA and cells, DNA for coding and information storage, Behavior of molecules in solution)
2. Introduction to Nanobiotechnology
3. Tools to study macromolecules
4. Bionanoengineering: Integrating physical, life, applied and clinical sciences
5. Bionanomaterials and Nanobiotechnology in the Health Sciences
6. Biophotonics for Surface Science
7. Biosensors, Bioactuators, and Drug Delivery
8. Careers in Nanobiomolecular Science and Engineering

Does this course overlap a course offered in your academic program? YES ☐ NO ☒
If YES, what course(s) and provide a justification of the overlap?

Does this course overlap a course offered in another academic area? YES ☐ NO ☒
If YES, what course(s) and provide a justification of the overlap?
Signature of Academic Chair(s) of the other academic area(s) is required on the signature sheet below.

6. Cross-listed Courses (Please fill out separate form for each PREFIX)
List Cross-listed Courses

Signature of Academic Chair(s) of the other academic area(s) is required on the signature sheet below.

Department responsible for staffing: Biology

7. References. *[Provide 3 - 5 references on which this course is based and/or support it.]*

1. Nanobiotechnology: Concepts, Applications and Perspectives (2005)
Christof M. Niemeyer (Editor), Chad A. Mirkin (Editor)
Wiley-VCH Publishers
2. Soft Machines: Nanotechnology and Life, Richard A.L. Jones, Oxford University Press, 2004
3."Nanotechnology: A gentle introduction to the next big idea" by M. Ratner and D. Ratner, 2002 ISBN 0131014005
4. "The Next Big Thing Is Really Small: How Nanotechnology Will Change the Future of Your Business" by Jack Uldrich and Deb Newberry, 2003 ISBN 1400046890
5. NanoBiotechnology Protocols in Methods in Molecular Biology Series.
Edited by S. J. Rosenthal and D. W. Wright, Humana Press, ISBN: 1-58829-276-2

8. List Faculty Qualified to Teach This Course.

Nitika Parmar and other Biology faculty members

9. Effective Date and Frequency.

a. Projected semesters to be offered: Fall ☒ Spring ☒ Summer ☐
b. First semester offered: Fall

10. New Resources Required. YES ☐ NO ☒

If YES, list the resources needed and obtain signatures from the appropriate programs/units on the sheet below.

a. Computer (data processing), audio visual, broadcasting needs, other equipment)

b. Library needs

c. Facility/space needs

11. Will this new course alter any degree, credential, certificate, or minor in your program? YES ☒ NO ☐

If, YES attach a program modification form for all programs affected.

Nitika Parmar	10/27/2006
Proposer of Course	Date

Approval Sheet

Program/Course: BIOL 408

Program Chair(s)	Date
General Education Chair(s)	Date
Curriculum Committee Chair(s)	Date
Dean of Faculty	Date