CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

DATE 12.6.06
PROGRAM AREA BIOLOGY

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

Prefix BIOL Course# 510 Title : TISSUE CULTURE TECHNIQUES AND STEM CELL TECHNOLOGY
Units (3)
1 hours lecture per week
6 hours laboratory per week
☒ Prerequisites BIOL 300
☐ Corequisites
Description Examines theory and concepts of animal and plant cell and tissue culturing. Focuses on stem cell technology including types of stem cells, ethics of stem cells, pluripotency, culture methods, characterization, monitoring tools such as imaging and differentiation strategies.

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	1	1	20	☒	
Seminar				☐	
Laboratory	2	3	20	☒	
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]*
Tissue Culture Techniques and Stem Cell Technology is a required course for the MS/MBA dual degree program. This course will provide students with a solid foundation in the theory and techniques of animal and plant tissue culture and an in-depth view of the current state of the science of human embryonic stem cells and their potential applications in regenerative medicine.

Learning Outcomes: Upon completion of the course, students will be able to:
1. Grow, maintain, and propagate specific animal and plant cell types in a sterile environment.
2. Identify the problems associated with growing, storing and identifying a wide range of different cell types and plant tissues.
3. Describe how cell culture can be used for in vitro studies and commercial applications.
4. Articulate the conceptual basis and ethicall issues surrounding stem cell research.
5. Demonstrate embryonic stem cell propogation methods.

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]*

Animal and Plant tissue culture

1. Various systems of tissue culture - their distinguishing features, advantages and limitations; types of media; types of cell lines and their maintenance; transfection strategies
2. Methodology: Primary culture; adherent and suspension cultures; maintenance of sterility and use of antibiotics; mycoplasma and contaminant detection; plant culture techniques such as micropropagation and callus cultures.
3. Characteristics of cells in culture and growth studies (Cell proliferation, cell cycle, mitosis).

Stem Cell Technology

1. Ethics - What are the pros and cons of using human embryonic stem cells vs. adult stem cells?
2. Culture methods - Description of the different culture methods.
3. Characterization and Differentiation - Includes the use of flow cytometry and immunocytochemistry and identification of differentiated tissues; strategies for differentiation; concept of pluripotency
4. New monitoring tools - Imaging and identifying stem cell morphology and cell numbers

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? There is some overlap between this course and BIOL 404. The differences are:
1. BIOL 404 is serving the undergraduate program and this one is serving the dual MS Biotechnology and MBA program;
2. BIOL 404 covers the basics of tissue culture. Stem cell technology is covered only slightly whereas BIOL 510's main emphasis will be on stem cell technology;
3. BIOL 404 requests a lab fee whereas BIOL 510 does not due to a different fee structure within Extended Education programs.

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:

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

1. Culture of Animal Cells: A Manual of Basic Technique, 4th Edition, 2000. R. Ian Freshney, ISBN: 0471348899 Publisher: Wiley-Liss
2. Basic Cell Culture (The Practical Approach Series), 2002. J. M. Davis, ISBN: 0199638535, Publisher: Oxford University Press, USA
3. Plant Tissue Culture: Techniques and Experiments, 2nd edition, 2000. Roberta H. Smith, ISBN: 0126503427 Publisher: Academic Press
4. Introduction to Plant Tissue Culture, M. K. Razdan. ISBN: 1578082374, Publisher: Science Publishers, Inc.
5. Embryonic Stem Cells, Methods and Protocols, by Kursad Turksen (Ottawa Health Research Institute, Ottawa, Ontario, Canada), Humana Press.
6. Human Embryonic Stem Cells, Second Edition, by Ann A. Kiesling and Scott C. Anderson

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: Spring

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	11/16/2006
Proposer of Course	Date

Approval Sheet

Program/Course: BIOL 510

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