

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS
NEW COURSE PROPOSAL

DATE 11.27.06
PROGRAM AREA BIOLOGY

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

Prefix BIOL Course# 404 Title : PLANT AND ANIMAL TISSUE CULTURE Units (3)

2 hours lecture per week

3 hours laboratory per week

☒ Prerequisites BIOL 300

☐ Corequisites

Description Introductory course in the theory and concepts of animal and plant cell and tissue culturing including the fundamentals of tissue culture techniques, subculturing and maintenance of cell lines and stem cell technology.

A lab fee is required.

☐ 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	2	1	15	<input checked="" type="checkbox"/>	
Seminar				<input type="checkbox"/>	
Laboratory	1	3	15	<input checked="" type="checkbox"/>	
Activity				<input type="checkbox"/>	

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]*

Plant and Animal Tissue Culture is a required course for a BS degree with an emphasis in Biotechnology. This course will provide students with a solid foundation in the theory and techniques of plant and animal tissue culture, preparing them for job placement in either academic or industry research settings. Specifically, in most biotechnology industries today, tissue culture is a routine technique and highly relevant for the development of various commercial products.

Learning Outcomes: At the end of the course, students should be able to:

1. Grow, maintain, and propagate specific plant and animal cell types in a sterile environment.
2. Handle, store and identify cells in culture.
3. Count, identify and assess viability of cells by microscopic examination.
4. Identify the problems associated with growing, storing and identifying a wide range of different cell types.
5. Describe how cell culture can be used for in vitro studies and commercial applications.
6. Analyze data using appropriate techniques.
7. Construct an accurate record of their laboratory work, in the form of a lab notebook including time plans and reports of their activities.
8. Produce a report of their work, which employs a range of skills of written expression and uses appropriate vocabulary consisting of a practical report.

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

Animal tissue culture

1. Various systems of tissue culture - their distinguishing features, advantages and limitations
2. Culture medium: Logic of formulation (natural media, synthetic media, sera).
3. Methodology: Primary culture (Behavior of cells, properties, utility); adherent and suspension cultures; maintenance of sterility and use of antibiotics; mycoplasma and contaminant detection.
4. Cell lines: Definition, development and maintenance of established cell lines.
5. Characteristics of cells in culture (Contact inhibition, anchorage (in) dependence, cell-cell communication, cell senescence, response to trophic factors).
6. Growth studies: Cell proliferation, cell cycle, mitosis in growing cells.
7. Transfection studies.

Plant tissue Culture

1. Development of plant tissue culture (Totipotency of plant cells).
2. Nutrient media (obligatory and optional constituents); Incubation systems (static, agitated culture systems).
3. In-vitro culture: physical, chemical and genotypic factors.
4. Growth and differentiation of cultured cells and tissues, cytodifferentiation, organogenesis and embryogenesis.
5. Culture systems: organ, callus, cell and protoplast cultures.
6. Assessment of growth and development in-vitro.
7. Secondary metabolism in cultured cells, increase of secondary metabolite production by suitable media supplements like elicitors, stress factors, precursors.

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. Plant Tissue Culture: Techniques and Experiments, 2nd edition, 2000. Roberta H. Smith, ISBN: 0126503427
Publisher: Academic Press
2. Introduction to Plant Tissue Culture, M. K. Razdan. ISBN: 1578082374, Publisher: Science Publishers, Inc.
3. Culture of Animal Cells: A Manual of Basic Technique, 4th Edition, 2000. R. Ian Freshney, ISBN: 0471348899
Publisher: Wiley-Liss
4. Cell and Tissue Culture for Medical Research, 2000. Alan Doyle and J. Bryan Griffiths, ISBN: 0471852139,
Publisher: John Wiley & Sons
5. Basic Cell Culture (The Practical Approach Series), 2002. J. M. Davis, ISBN: 0199638535
Publisher: Oxford University Press, USA
6. Supplemental: Animal Cell Culture Methods ("Methods in Cell Biology", Vol 57, 1998) Jennie P. Mather and David Barnes, ISBN: 0124800408, Publisher: Academic Press

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
Plant growth chambers (plant biological incubators)

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
Proposer of Course

9/28/2006
Date

Approval Sheet

Program/Course:

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