

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM AREA BIOLOGY

- 1. Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

BIOL 509 PLANT BIOTECHNOLOGY (4)

Three hours of lecture and three hours of laboratory per week.

Prerequisites: BIOL 400 and BIOL 422 or permission of instructor

This course will examine the scientific and technical advances which underlie the production of genetically modified crops. Topics include: plant genome organization and gene expression, plant tissue culture and genetic transformation, genetic manipulation to confer resistance to herbicides, pests and disease and strategies for engineering stress tolerance and the improvement of crop yield and quality.

- 2. Mode of Instruction.**

	Units	Hours per Unit	Benchmark Enrollment
Lecture	<u>3</u>	<u>1</u>	<u>15</u>
Seminar	_____	_____	_____
Laboratory	<u>1</u>	<u>3</u>	<u>15</u>
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]*

Plant Biotechnology is an elective course for graduate students in the Professional Master of Science Degree Program in Bioinformatics.

Students who successfully complete this course will be able to:

- Describe plant genome organization and the mechanisms of gene expression in plants
- Explain how plant tissue is cultured
- Explain how genetic manipulation can be used to confer resistance to herbicides, pests and disease
- Describe how crop yields and quality can be enhanced using genetic modifications

- 4. Is this a General Education Course** **YES** **NO**

If Yes, indicate GE category:

A (English Language, Communication, Critical Thinking)	
B (Life Sciences)	
C (Fine Arts, Literature, Languages & Cultures)	
D (Social Perspectives)	
E (Human Psychological and Physiological Perspectives)	

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

Plant genomes - the organization and expression of plant genes

Plant tissue culture

Techniques for plant transformation

Binary vectors for plant transformation
The genetic manipulation of herbicide resistance
The genetic manipulation of pest resistance
Plant disease resistance
Reducing the effects of viral diseases
Strategies for stress tolerance
The improvement of crop yield and quality
Molecular farming or "pharming"
Future prospects for GM crops

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

Slater, Scott and Fowler. (2003). *Plant Biotechnology: The genetic manipulation of plants*. Oxford University Press.

Callow, Ford-Lloyd, Newbury and Callow. (1997) *Biotechnology and plant genetic resources: Conservation and use*. CABI publishing.

Chrispeels, Sadava and Chrispeels. (2002). *Plants, Genes and Crop Biotechnology*, 2nd Edition. Jones & Bartlett Pub.

Buchanan, Gruissem and Jones. (2002). *Biochemistry and molecular biology of plants*. John Wiley & Sons

7. List Faculty Qualified to Teach This Course.

Biology Faculty

8. Frequency.

a. Projected semesters to be offered: Fall _____ Spring X Summer _____

9. New Resources Required.

- a. Computer (data processing), audio visual, broadcasting needs, other equipment
- b. Library needs
- c. Facility/space needs

10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

Nancy Mozingo
Proposer of Course

31 October 2003

Date