

CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

COURSE MODIFICATION PROPOSAL

**Courses must be submitted by November 2, 2009,
to make the next catalog (2010--2011) production**

DATE (CHANGE DATE EACH TIME REVISED): 10-15-09; REV 12.8.09

PROGRAM AREA(S): BIOLOGY

Directions: All of sections of this form must be completed for course modifications. All documents are stand alone sources of course information.

1. Course Information.

[Follow accepted catalog format.] (Add additional prefixes if cross-listed)

OLD

Prefix **BIOL** Course# **509** Title PLANT BIOTECHNOLOGY
Units **(4)**
3 hours lecture per week
3 hours blank per week

☒ Prerequisites: BIOL 400 and BIOL 422 or permission of instructor

☒ Consent of Instructor Required for Enrollment

☐ Corequisites: ☐

Catalog Description (Do not use any symbols): 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.

| | | | | |
|--|--------------------------|---|--------------------------|--|
| General Education | <input type="checkbox"/> | Graded | <input type="checkbox"/> | Repeatable |
| Categories <input type="checkbox"/> | <input type="checkbox"/> | CR/NC | <input type="checkbox"/> | for up to <input type="checkbox"/> units |
| <input type="checkbox"/> Lab Fee Requested | <input type="checkbox"/> | <input checked="" type="checkbox"/> A - F | <input type="checkbox"/> | Total |
| | | | <input type="checkbox"/> | Completions <input type="checkbox"/> |
| Course Level: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Multiple |
| <input type="checkbox"/> Undergraduate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Enrollment in |
| <input type="checkbox"/> Post-bac/Credential | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | same semester |
| <input checked="" type="checkbox"/> Graduate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | choice) |

NEW

Prefix **BIOL** Course# **509** Title PLANT BIOTECHNOLOGY
Units **(4)**
3 hours lecture per week
3 hours laboratory per week

☒ Prerequisites: **BIOL 504**

☒ Consent of Instructor Required for Enrollment

☐ Corequisites: ☐

Catalog Description (Do not use any symbols): Examines 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.

| | | | | |
|--|--------------------------|---|--------------------------|--------------------------------------|
| General Education | <input type="checkbox"/> | Graded | <input type="checkbox"/> | Repeatable for |
| Categories <input type="checkbox"/> | <input type="checkbox"/> | CR/NC | <input type="checkbox"/> | up to <input type="checkbox"/> units |
| <input type="checkbox"/> Lab Fee Requested | <input type="checkbox"/> | <input checked="" type="checkbox"/> A - F | <input type="checkbox"/> | Total |
| | | | <input type="checkbox"/> | Completions <input type="checkbox"/> |
| Course Level: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Multiple |
| <input type="checkbox"/> Undergraduate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Enrollment in same |
| <input type="checkbox"/> Post-bac/Credential | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | semester |
| <input checked="" type="checkbox"/> Graduate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | choice) |

2. Mode of Instruction (Hours per Unit are defaulted)

Hegis Code(s) _____
(Provided by the Dean)

Existing

Proposed

| | Units | Hours Per Unit | Benchmark Enrollment | Graded | | Units | Hours Per Unit | Benchmark Enrollment | Graded | CS No. (filled out by Dean) |
|---------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-----------------------------|
| Lecture | 3 | 1 | 15 | <input type="checkbox"/> | Lecture | 3 | 1 | 15 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Seminar | <input type="checkbox"/> | 1 | <input type="checkbox"/> | <input type="checkbox"/> | Seminar | <input type="checkbox"/> | 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Lab | 1 | 3 | 15 | <input type="checkbox"/> | Lab | 1 | 3 | 15 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Activity | <input type="checkbox"/> | 2 | <input type="checkbox"/> | <input type="checkbox"/> | Activity | <input type="checkbox"/> | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Field Studies | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Field Studies | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Indep Study | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Indep Study | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other blank | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Other blank | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. 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).

4. Justification and Requirements for the Course. *[Make a brief statement to justify the need for the course]*

OLD

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

- Requirement for the Major/Minor
- x Elective for the Major/Minor
- Free Elective

NEW

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

- Requirement for the Major/Minor
- x Elective for the Major/Minor
- Free Elective

Submit Program Modification if this course changes your program.

5. Learning Objectives. (List in numerical order. You may wish to visit resource information at the following website: <http://senate.csuci.edu/comm/curriculum/resources.htm>)

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

OLD

- 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

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

NEW

- Describe plant genome organization and analyze mechanisms of gene expression in plants
- Explain how plant tissue is cultured and apply plant tissue culture techniques
- Demonstrate an understanding of how genetic manipulation can be used to confer resistance to herbicides, pests and disease
- Analyze how crop yields and quality can be enhanced using genetic modifications

6. Course Content in Outline Form. (Be as brief as possible, but use as much space as necessary)

OLD

Plant genomes - the organization and expression of plant genes

NEW

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

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

Does this course content overlap with a course offered in your academic program? Yes ☐ No ☒

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 ☒

If YES, what course(s) and provide a justification of the overlap.

Overlapping courses require Chairs' signatures.

7. 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).
- B. List each cross-listed prefix for the course:
- C. Program responsible for staffing:

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

OLD

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

NEW

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

9. Tenure Track Faculty qualified to teach this course.

Biology faculty

10. Requested Effective Date or First Semester offered: **F2010**

11. New Resource Requested: Yes ☐ No ☒

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: Yes ☐ No ☐ (Refer to the Dean's Office for additional processing)

E. Other. ☐

12. Indicate Changes and Justification for Each. *[Check all that apply and follow with justification. Be as brief as possible but, use as much space as necessary.]*

| | |
|---|---|
| <input type="checkbox"/> Course title | <input type="checkbox"/> Course Content |
| <input type="checkbox"/> Prefix/suffix | <input type="checkbox"/> Course Learning Objectives |
| <input type="checkbox"/> Course number | <input type="checkbox"/> References |
| <input type="checkbox"/> Units | <input type="checkbox"/> GE |
| <input type="checkbox"/> Staffing formula and enrollment limits | <input type="checkbox"/> Other <input type="checkbox"/> |
| <input checked="" type="checkbox"/> Prerequisites/Corequisites | <input type="checkbox"/> Reactivate Course |
| <input checked="" type="checkbox"/> Catalog description | |
| <input type="checkbox"/> Mode of Instruction | |

Justification: Since BIOL 504 is a foundation course for the MS Biotechnology and Bioinformatics program, students are advised to take BIOL 504 early on during their program of study and then take other required and elective courses. However, in the last few years of offering the program, we realized that some students have postponed taking BIOL 504, sometimes to the last term. To make sure students complete their foundation course first, BIOL 504 is included as a prerequisite course for BIOL 509, which requires the knowledge of 504 for students to succeed.

13. Will this course modification alter any degree, credential, certificate, or minor in your program? Yes ☐ 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**.

Last day to submit forms to be considered during the current academic year: **April 15th**.

Ching-Hua Wang

10-15-09

Proposer(s) of Course Modification

Date

Type in name. Signatures will be collected after Curriculum approval.

Approval Sheet

Course:

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 Intl Affairs Director | | |
| | Signature | Date |
| Center for Integrative Studies Director | | |
| | Signature | Date |
| Center for Multicultural Engagement Director | | |
| | Signature | Date |
| Center for Civic Engagement and Service Learning Director | | |
| | Signature | Date |
| Curriculum Chair | | |
| | Signature | Date |
| Dean of Faculty | | |
| | Signature | Date |