

OHLONE COLLEGE
Ohlone Community College District
OFFICIAL COURSE OUTLINE

I. Description of Course:

1. **Department/Course:** BIOT - 114B
2. **Title:** Applications in Plant and Food Biotechnology
3. **Cross Reference:**
4. **Units:** 2
Lec Hrs: 1.5
Lab Hrs: 1.5
5. **Repeatability:** No
6. **Grade Options:** Grade Only (GR)

7. **Degree/Applicability:**
Credit, Degree Applicable, Transferable - CSU (T)
8. **General Education:**
9. **Field Trips:** Not Required
10. **Requisites:**
Prerequisite
BIOT 114A Introduction to Plant Biology and

12. Catalog Description:

This is an elective in the Biotechnology Certificate Program, where students are trained for positions in the biotechnology industry. This course builds upon the basic skills learned in Biot114A and provides plant and food biotechnology specific skills and knowledge. Topics include plant genetic engineering, the growth and development of plants in culture and the greenhouse, as well as genetic engineering of plants and microbes involved in food production.

13. Class Schedule Description:

Plant biotech applications- plant cell culture, greenhouse techniques, recombinant DNA, biochemical techniques, etc.

14. Counselor Information:

This is an elective course in the Biotechnology Certificate Program. It provides students with additional biotech skills that will assist them getting positions in the plant and food biotech industries. Completion of Biot 114A is required for enrollment in Biot 114B.

II. Student Learning Outcomes

The student will:

1. Demonstrate knowledge of plants, their growth and culture.
2. Demonstrate knowledge of recombinant DNA techniques and how they apply to plants.
3. Explain how plants grow, photosynthesize and develop.
4. Explain why and how a scientist would genetically engineer a plant with a novel useful trait.
5. Compare and contrast the various methods of gene delivery
6. Describe the physiology, biochemistry, anatomy and morphology of plants.
7. Explain the role of microbes in producing foods and beverages.
8. Demonstrate knowledge of the agricultural and food industries.
9. Explain the role of the USDA and EPA as it pertains to genetically modified organisms (GMOs)
10. Summarize current issues in plant and food biotechnology and the steps being taken to

address these issues.

III. **Course Outline:**

- A. Introduction of Plant Biotechnology-Lecture
Isolation of DNA-Lab
- B. Plant Genomes-Lecture
Gel Analysis of DNA-Lab
- C. Plant Genetics-Lecture
RAPD analysis of DNA-Lab
- D. Plant gene expression-Lecture
RNA isolation from plants-Lab
- E. Exam-Lecture
GFP analysis in Arabidopsis-Lab
- F. Arabidopsis as a model system and genetic engineering of plants-Lecture
In vitro culture of Arabidopsis-Lab
- G-Plant bioreactors, microbes and fermentation-Lecture
GFP expression in E. coli-Lab
- H. Food Biotechnology and biosafety-Lecture
RT-PCR analysis of RNA-Lab
- I. -Final Exam-Lecture
Research presentations-Lab

IV. **Course Assignments:**

- A. Reading Assignments
 - 1. 1. Textbook reading
- B. Projects, Activities, and other Assignments
 - 1. 1. Presentation of a research or lab topic in a power point presentation
- C. Writing Assignments
 - 1. 1. Term paper on a selected topic

V. **Methods of Evaluation/Assessment:**

- A. A. Essay and objective midterm and final exams
- B. B. 1 presentation
- C. C. 1 written paper following course guidelines

VI. **Methods of Instruction:**

- A. Laboratory
- B. Discussion
- C. Audiovisual
- D. Lecture

VII. **Textbooks:**

Required

- 1. Slater et al *Plant Biotechnology* 1st Edition, Oxford, 2003 ISBN: 0199254680

Optional

VIII. **Supplies:**