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

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

V. Methods of Evaluation/Assessment:
   A. Essay and objective midterm and final exams
   B. 1 presentation
   C. 1 written paper following course guidelines

VI. Methods of Instruction:
   A. Laboratory
   B. Discussion
   C. Audiovisual
   D. Lecture

VII. Textbooks:
   Required
   Optional

VIII. Supplies: