



# EL CAPITAN HIGH SCHOOL



Course: Ag Biology

Instructor: Ms. Casso

## I. COURSE DESCRIPTION

Agricultural Biology is a one year, laboratory science course, designed for the college bound student with career interests in agriculture. Using agriculture as a learning vehicle, the course emphasizes the principles, central concepts and inter-relationships among the following topics: the molecular and cellular aspects of life, the chemical and structural basis of life, energetics of life, growth and reproduction in plants and animal genetics, taxonomy of modern agricultural plants and animals, animal behavior, ecological relationships among plants, animals, humans and the environment, nutrition in animals, health and diseases in animals, and the similarities between animals and humans. The course is centered on an extensive laboratory component in order to connect the big ideas of all life science with agricultural applications, earth and physical science principles, and other curricular areas, including written and oral reporting skills.

### A. COURSE GOALS

1. Utilize agricultural applications as a relevant vehicle to teach biological science principles and improve the scientific literacy of students.
2. Strengthen instruction in science for students pursuing professional level careers in agriculture.
3. Integrate mathematics standards, language arts standards, and career employability standards including creative thinking and problem solving skills, and technological literacy related to the agricultural industry.
4. Meet a portion of the laboratory science requirement for admission to the University of California and California State University systems.
5. Develop a sense of interrelationships between life, earth, and physical science and their relationship to agricultural applications.
6. To motivate underrepresented populations to study and pursue careers in science and agriculture.

### B. PREREQUISITE

This course is recommended for students in grade nine or ten. This course meets the A-G requirement for Biology. Thus, any student completing Agriculture Biology is receiving both graduation credit and U.C. Credit for the class.

### C. COURSE FORMAT

1. Classroom instruction, including:
  - Discussion
  - Demonstration
  - Lecture
  - Laboratory exercises

2. Assessments
  - Benchmarks (District Performance Assessments)
  - Signature Assessments (Common Site Assessments)
  - Tests
  - Quizzes
  - Projects
3. FFA leadership experiences, including:
  - Verbal and written communication exercises
  - Leadership development activities

#### **D. ASSESSMENT**

1. 45% of the grade will be based on classroom instruction and laboratory exercises, including:
  - Projects
  - Papers
  - Laboratory & field research
  - Homework
2. 45% of the grade will be based on the scores received during formal assessment in the form of benchmarks, quizzes, and tests, signature assessments.
3. 10% of the grade will be based on FFA participation
  - Ongoing Supervised Agricultural Experience Project record books

## **II. COURSE OUTLINE**

### **A. Scientific Investigations**

1. Scientific process
2. Usage of tools and technology to perform tests, collect data, and analyze results

### **B. The Chemistry of Life**

1. Atoms, Ions, and Molecules
2. Carbon-based molecules
3. Chemical reactions
4. Enzymes

### **C. Cells and Energy**

1. Energy and ATP
2. Photosynthesis
3. Cellular Respiration

### **F. Respiratory and Circulatory Systems**

1. Respiratory and Circulatory Functions
2. Respiration and gas exchange

### **G. Mitosis and Meiosis**

1. The cell cycle
2. Mitosis
3. Chromosomes and Meiosis

4. The process of Meiosis

## **H. Genetics**

1. Mendel and Heredity
2. Traits, Genes, and Alleles
3. Traits and probability
4. Meiosis and Genetic Variation
5. Sex-linked traits

## **I. From DNA to Proteins**

1. Structure of DNA
2. DNA Replication
3. Transcription
4. Translation
5. Genetic Engineering

## **K. Principles of Evolution**

1. Darwin's Observations
2. Theory of Natural Selection
3. Evidence of Evolution

## **L. The Evolution of Populations**

1. Genetic Variation within populations
2. Mechanisms of Evolution
3. Speciation through Isolation

## **M. Principle of Ecology**

1. Relationships in Ecology
2. Biotic and Abiotic Factors
3. Energy in Ecosystems
4. Food Chains and Food Webs
5. Cycling of Matter

## **N. Fetal Pig Dissection**

## **O. FFA, SAE, and Record books**

1. The National FFA Organization
2. FFA activities
3. Personal project recordkeeping