

**College of San Mateo**  
**Official Course Outline**

1. **COURSE ID:** BIOL 195    **TITLE:** Biology Field Laboratory  
**Units:** 1.0 units    **Hours/Semester:** 48.0-54.0 Lab hours  
**Method of Grading:** Letter Grade Only  
**Prerequisite:** Completion of or concurrent enrollment in BIOL 100, or BIOL 102 or BIOL 140 (Skyline) or BIOL 145 or BIOL 184
  
2. **COURSE DESIGNATION:**  
**Degree Credit**  
**Transfer credit:** CSU; UC  
**AA/AS Degree Requirements:**  
    CSM - GENERAL EDUCATION REQUIREMENTS: E5a. Natural Science  
**CSU GE:**  
    CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B3 - Laboratory Activity  
**IGETC:**  
    IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: C: Science Laboratory
  
3. **COURSE DESCRIPTIONS:**  
**Catalog Description:**  
    Emphasis on field trips to selected sites with laboratory preparation. Covers a wide range of topics including animals, both domestic and wild; natural and human-made ecosystems; forests; habitat disruption; and museums and parks. Laboratory and field investigations conducted using the scientific method. Emphasizes critical thinking skills. Designed for non-science majors to fulfill laboratory science G.E. requirement.
  
4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**  
    Upon successful completion of this course, a student will meet the following outcomes:
  1. Explain the importance of the ecology, evolution, and diversity of life.
  2. Identify and describe the local organisms and major ecosystems of the San Francisco Bay area.
  3. Investigate biology by applying the scientific method, following instructions, working cooperatively, and using laboratory/field skills and logical reasoning.
  
5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**  
    Upon successful completion of this course, a student will be able to:
  1. Connect and appreciate textbook theory with real world situations and examples.
  2. Develop and fine-tune ability to make observations, record information, make judgments and scientific conclusions.
  3. Have a better field sense of the immediate Bay Area Environment.
  4. Enjoy and appreciate a wider holistic view of the real world.
  5. Promote student involvement in positive community environmental issues & activities.
  6. Employ the scientific method in evaluation of field and lab data.
  7. Engage in critical thinking and problem solving.
  
6. **COURSE CONTENT:**  
**Lecture Content:**  
    This is a 1-unit lab only course and there are no lectures.  
**Lab Content:**
  1. Introduction to and application of field methodology
    - A. Orientation (determining choice of methods and sites available, maps usage, collection/use of data)
    - B. Environmental characteristics to observe/witness, measure, evaluate (human developed vs. natural)
    - C. Habitat and community types (as many different types as possible - natural, disturbed, developed, eco-problems and eco-solutions)
  2. Discussion of unifying principles of biology, ecology, forestry, behavior, wildlife, conservation, aesthetics, ethics
    - A. Laboratory introduction of scientific methods and procedures, classification schemes

- B. Laboratory introduction to experimental design, sampling methods, and data analysis
- C. Experiments performed through actual data collection or hands-on/online simulations
- D. Laboratory introduction to specimen classification:
  - a. Microorganisms and small macroorganisms
  - b. Plant classification
  - c. Animal classification
  - d. Ecosystem dynamics - food chains

3. Possible field trips sites

- A. Botanical gardens (G.G. park, U.C. Berkeley, Stanford University)
- B. Zoological gardens (S.F. Zoo, Oakland Zoo, CuriOdyssey)
- C. California Academy of Sciences (S.F.)
- D. S.P.C.A. and animal rehabilitation centers
- E. Sewerage treatment plant (Palo Alto)
- F. Parks and ecosystems
  - a. Huddart County Park (Woodside)
  - b. Edgewood Preserve (Redwood City)
  - c. Junipero Serra (Brisbane)
  - d. Palo Alto Baylands Nature Preserve (Palo Alto)
  - e. Fitzgerald Marine Reserve (Moss Beach)
  - f. Pillar Point tide pools (El Granada)
  - g. Purisima Creek Open Space (Redwood City)
  - h. Hayward Shoreline Interpretive Center (Hayward)
  - i. Various locations on CSM campus
- G. Alternative labs/field trips
  - a. Memorial County Park (Loma Mar)
  - b. Animal research facility - Stanford Medical Center
  - c. U.S Army Corps of Engineers Bay Model (Sausalito)
  - d. Marine Mammal Rescue Center (Marin County)
  - e. U.C. Santa Cruz Marine Lab (Santa Cruz)
  - f. County Planning Commission Dept. (Redwood City)
  - g. Guest speakers/representatives from local agencies, parks, and organizations (S.P.C.A, Forest Service, Parks)
  - h. Oakland Museum (Oakland)
  - i. Berkeley Hall of Science (U.C. Berkeley)
  - j. Student project and/or cooperative volunteer sites
  - k. Ano Nuevo State Park (Pescadero)
    - l. Marine Science Institute (Redwood City)
  - m. Sugar Loaf Mountain (San Mateo)
  - n. Online documentaries and virtual field trips (PBS, CSM library, YouTube)

**TBA Hours Content:**

There are no TBA hours for this course.

**7. REPRESENTATIVE METHODS OF INSTRUCTION:**

Typical methods of instruction may include:

- A. Lab
- B. Critique
- C. Activity
- D. Discussion
- E. Experiments
- F. Field Experience
- G. Field Trips
- H. Observation and Demonstration
  - I. Other (Specify): Online lab exercises, simulations, videos, virtual field trips, quizzes, slides, maps, models, computer simulations, group discussions/presentations, and laboratory projects/reports.

**8. REPRESENTATIVE ASSIGNMENTS**

Representative assignments in this course may include, but are not limited to the following:

**Writing Assignments:**

1. Weekly write-ups of field trip/experiments, observation results, conclusions, suggested involvement.
2. Demonstration of integration of concepts and ideas through:
  - a. online review of trips and experiments through

reading and quizzes, b. answering critical thinking questions and discuss sources of error, perform calculations on collected data through simulations and actual experiments, d. practical problem-solution scenarios to improve critical thinking skills, and e. discussions of topic of lab exercised related to real world situations

**Reading Assignments:**

Supplemental readings on contents such as environmental issues, animal/plant species damage, and examples of progress will be made available through online primary and secondary sources such as articles from Sci. Am, Sci., Nature, PBS, newspapers, National Geographic, science textbooks, and through CSM library.

**9. REPRESENTATIVE METHODS OF EVALUATION**

Representative methods of evaluation may include:

- A. Class Participation
- B. Exams/Tests
- C. Field Trips
- D. Homework
- E. Lab Activities
- F. Projects
- G. Quizzes
- H. Quizzes and final exam include the following types of questions: short-answer, fill-in, dichotomous key, and sight identification of species. Laboratory and field trips exercises includes homework questions. Students must maintain a laboratory notebook throughout the course. Individual and/or group projects may be assigned, as well as cooperative volunteer projects.

**10. REPRESENTATIVE TEXT(S):**

Possible manuals include:

- A. Perry, J. W.. Laboratory Manual for Non-Major Biology (6th Edition), Brooks Cole, 06-06-2012
- B. Reece, J. B., et al.. Investigating Biology Lab Manual (7th Edition), Benjamin Cummings, 10-18-2010
- C. Wagner, T. P. & Sanford, R.. Environmental Science: Active Learning Laboratories and Applied Problem Sets, Wiley, 01-27-2009
- D. Brower, J. E., Zar, J. H., & von Ende, C. N.. Field and Laboratory Methods for General Ecology, McGraw-Hill, 08-01-1997

Other:

- A. Kananagh, J. The Nature Of California: An Introduction To Familiar Plants And Animals & Outstanding Natural Attractions. Waterford Press, 2006.

**Origination Date:** September 2020

**Curriculum Committee Approval Date:** November 2020

**Effective Term:** Fall 2021

**Course Originator:** Huy Tran