

College of San Mateo
Official Course Outline

1. **COURSE ID:** BIOL 195 **TITLE:** Biology Field Laboratory
Semester Units/Hours: 1.0 units; a minimum of 48.0 lab hours/semester
Method of Grading: Letter Grade Only
Prerequisite: Completion of or concurrent enrollment in BIOL 100, 102, 145, 140 or 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:**
Lab Content:
 1. Introduction to and application of field methodology
 1. Orientation (determining choice of methods and sites available, maps usage, collection/use of data)
 2. Environmental characteristics to observe/witness, measure, evaluate. (Human developed - vs. - natural)
 3. 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
 1. laboratory introduction of scientific methods and procedures, classification schemes
 2. laboratory introduction to geophysiology and maps
 3. laboratory introduction to specimen classification:

1. Microorganisms and small macroorganisms
2. Plant classification
3. Animal classification
4. Ecosystem dynamics - food chains
3. Possible field trips sites
 1. Botanical gardens (G.G. park or U.C. Berkeley or Stanford University)
 2. Zoological gardens (S.F. Zoo, Oakland Zoo or Coyote Point Zoo)
 3. California Academy of Sciences (S.F.)
 4. S.P.C.A. and animal rehabilitation
 5. Sewerage treatment plant (Palo Alto)
 6. Parks/ecosystems/plant communities
 1. Huddart (Woodside)
 2. Edgewood (Redwood City)
 3. Junipera Serra (Brisbane)
 4. Palo Alto Baylands Nature Preserve
 5. Fitzgerald Marine Reserve (Moss Beach)
 6. Pillar Point tide pools (El Granada)
 7. Hayward Shoreline Interpretive Center
 7. Alternate labs/field trips
 1. San Mateo Memorial Park (Coastside)
 2. logging area and processing (Coastside)
 3. Animal research facility - Stanford Medical Center
 4. S.F. Bay model (S.F.)
 5. Marine Mammal Rescue Center (Marina County)
 6. U.C. Santa Cruz Marine lab (Santa Cruz)
 7. Co. Planning Commission Dept. (Redwood City)
 8. Endangered species farm
 9. Guest speakers/representatives from local agencies/parks/organizations (S.P.C.A/Forest Service/Parks)
 10. organizations possible.
 11. Oakland Museum (Oakland)
 12. Berkeley Hall of Science (U.C. Berkeley)
 13. Student project and/or cooperative volunteer sites
 14. Ano Nuevo elephant seal reserve
 15. M.S.I. (Marine Science Institute) boat excursion - S.F. Bay ecology
 16. Sugar Loaf Mountain (San Mateo)

7. REPRESENTATIVE METHODS OF INSTRUCTION:

Typical methods of instruction may include:

1. Lab
2. Activity
3. Discussion
4. Experiments
5. Field Experience
6. Field Trips
7. Observation and Demonstration
8. Other (Specify): Online exercises and quizzes, slides, maps, models, computer simulations, video tape/CD-ROM/online videos, group discussions/presentations and laboratory 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.
 - a. Online review of trips and experiments through reading and quizzes
 - b. Answering critical thinking questions and discuss sources of error
 - c. Calculations performed on data collect
 - d. Practical problem-solution scenarios to improve critical thinking skills

Reading Assignments:

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

9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

1. Class Participation
2. Exams/Tests
3. Field Trips
4. Home Work
5. Lab Activities
6. Projects
7. Quizzes
8. 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:

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

Other:

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

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Course Originator: Huy Tran