

# BIOL G104L: MARINE LIFE LABORATORY

| Item                                                                   | Value                                  |
|------------------------------------------------------------------------|----------------------------------------|
| Curriculum Committee Approval Date                                     | 11/19/2024                             |
| Top Code                                                               | 040100 - Biology, General              |
| Units                                                                  | 1 Total Units                          |
| Hours                                                                  | 54 Total Hours (Lab Hours 54)          |
| Total Outside of Class Hours                                           | 0                                      |
| Course Credit Status                                                   | Credit: Degree Applicable (D)          |
| Material Fee                                                           | Yes                                    |
| Basic Skills                                                           | Not Basic Skills (N)                   |
| Repeatable                                                             | No                                     |
| Open Entry/Open Exit                                                   | No                                     |
| Grading Policy                                                         | Standard Letter (S)                    |
| California General Education Transfer Curriculum (Cal-GETC)            | • Cal-GETC 5C Laboratory Activity (5C) |
| Intersegmental General Education Transfer Curriculum (IGETC)           | • IGETC 5C Laboratory Activity (5C)    |
| California State University General Education Breadth (CSU GE-Breadth) | • CSU B3 Laboratory Activity (B3)      |

## Course Description

This course explores the basic principles of the life sciences taking its examples from the sea. The ecological relationship between humans and the sea is emphasized. Field trips are also an integral part of the course, focusing on the structure of marine ecosystem. This course is designed for non-science majors. PREREQUISITE: BIOL G104 or concurrent enrollment. Transfer Credit: CSU; UC.

## Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Classify and describe the diversity of marine organisms and ecosystems.
3. Evaluate the human impact on marine ecosystems and fisheries.
4. Interpret data and biological reports using evidence-based reasoning.

## Course Objectives

- 1. Apply the scientific method to evaluate topics in marine biology.
- 2. Identify and describe major groups of marine biota including microorganisms, algae, marine flowering plants, and marine invertebrates and vertebrates.
- 3. Describe the characteristics of marine ecosystems and associated marine life found throughout Southern California.
- 4. Measure abiotic parameters, such as salinity and pH, in the laboratory and the field.
- 5. Use field biology techniques to sample biodiversity in the field.
- 6. Identify morphological characteristics of phytoplankton and zooplankton using a microscope.
- 7. Compare morphology and physiology of marine invertebrates and vertebrates through guided dissections.

- 8. Analyze, evaluate, and present experimental data in a written laboratory report.
- 9. Evaluate anthropogenic issues affecting marine ecosystems, fisheries, and methods to reduce environmental impact (such as sustainability and conservation).

## Lecture Content

## Lab Content

Introduction to Laboratory Procedures Lab and field safety Basic use of standard laboratory and field equipment Boat safety and orientation Introduction to the Scientific Method and Data Analysis Hypothesis testing Data collection and analysis Presentation of results Completion of laboratory reports Measurements of Physical Factors in the Marine Environment pH, temperature, salinity Possible modifications to water quality Geographical Tides Steams Waves Topography Weather Anthropogenic factors Effluent Urban development Identification and Classification Marine microorganisms Use of the microscope Multicellular primary producers Marine Invertebrates: taxonomy, characteristics, and feeding mechanisms Porifera Cnidaria Ctenophora Mollusca Arthropoda Platyhelminthes Annelida Echinodermata Marine Vertebrates Chordata Chondrichthyes Diversity Dissections: anatomy and physiology Osteichthyes Diversity Dissections: anatomy and physiology Marine reptiles and seabirds Observations and Analysis of Local Marine Ecosystems Estuarine ecology Estuarine plant diversity and distribution Shorebird observations: resource partitioning Effects of coastal pollution Rocky intertidal ecology Intertidal diversity and adaptations Human activity in intertidal communities Nearshore sandy bottom ecology Sandy bottom diversity Distribution and abundance of calm vs. dynamic sandy bottom environments Marine Biology Research Methods Usage of collection and observation equipment aboard a research vessel Identification of marine life Comparison of diversity and abundance between different environments

## Method(s) of Instruction

- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

## Reading Assignments

Marine Laboratory Manual Reference to Field Guide Scholarly journal articles pertaining to marine biology

## Writing Assignments

Laboratory reports detailing results and conclusions of lab activities. Essays and short response questions, through homework and examination, that demonstrate proficiency in course objectives.

## Out-of-class Assignments

Reading, completion of lab assignment and post-lab questions. Library research project (individual or group) involving critical thinking, reasoning, and skills in data collection, correlation, conclusion. Field trips to various field sites in Southern California. This will include salt marshes, sandy, and rocky beaches, offshore marine research cruise, and trips to aquaria.

## Demonstration of Critical Thinking

Students must organize and analyze data gathering in the laboratory and field. Students will use data and lab content to differentiate between

different marine ecosystems found in California and the adaptations of marine organisms to these systems. Additionally, students will be asked to evaluate ethical fisheries management by comparing and contrasting fishing techniques and associated bycatch.

### **Required Writing, Problem Solving, Skills Demonstration**

Students are required to submit a lab report for each lab. Lab reports include recording observations, answering post-lab critical thinking questions, problem-solving, and evidence-based reasoning. Several labs require the proper demonstration of lab and field equipment to record necessary data. Semester project(s) require students to research, evaluate, and present on topics relevant to marine biology and/or conservation.

### **Eligible Disciplines**

Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required. Earth science: Master's degree in geology, geophysics, earth sciences, meteorology, oceanography, or paleontology OR bachelor's degree in geology AND master's degree in geography, physics, or geochemistry OR the equivalent. Master's degree required.

### **Textbooks Resources**

1. Required Sept, J.D. The New Beachcomber's Guide to Seashore Life of California, 2nd(most recent) ed. Harbour Publishing, 2024

### **Manuals Resources**

1. Castro, P., Huber, M. Marine Science Laboratory Manual, McGraw Hill , 01-01-2025

### **Other Resources**

1. Laboratory handouts