BIOL G104: MARINE LIFE

Item	Value
Curriculum Committee Approval Date	11/05/2024
Top Code	040100 - Biology, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Local General Education (GE)	• Area 5 Natural Sciences (GB1)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5B Biological Sciences (5B)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5B Biological Sciences (5B)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B2 Life Science (B2)

Course Description

This course will examine the diversity of marine life including their natural history, behavior, habitats, physiology, and ecology. It will introduce students to marine conservation and management issues, including the concepts of global warming, types of pollution, the consequences of greenhouse gases, and fisheries management. Transfer Credit: CSU; UC.

Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Describe the core concepts of biology as they pertain to marine biology.
3. Explain how physical and chemical properties influence oceans and ocean basins.
4. Identify the diversity and adaptations of organisms found in each marine environment.
5. Distinguish differences among major marine environments.
6. Outline human impact on marine ecosystems.

Course Objectives

- 1. Discuss biological principles using concepts and examples from marine biology.
- 2. Explain how geological, physical, and chemical processes influence oceans and ocean basins.
- 3. Explain how biotic and abiotic factors influence the distribution patterns and adaptations of the various life forms in the ocean (intertidal through pelagic realms).
- 4. Identify and describe the classification and phylogenetic relation of marine organisms.
- 5. Identify and describe marine habitats in terms of their geographic distribution, dominant oceanographic features, representative species and adaptations, and conservation.
- 6. Interpret how ecological principles effect marine life, particularly within the Southern California area.
- 7. Describe the influence of humans on the chemical, physical, and biological make-up of the world?s oceans.
- 8. Evaluate current issues and policies affecting marine life and oceans using scientific principles and research.

Lecture Content

The Science of Marine Biology The oceans' influence on our daily lives The history of marine biology Introduction to the scientific method Introduction to Oceanography Geological provinces of the ocean Identification of ocean basins and seas Physical properties and biological implications of waves, tides, and currents Properties and composition of seawater Temperature and light in the marine environment Classifications of marine habitats Fundamentals of Biology Characteristics of life Overview of organic chemistry: carbohydrates, proteins, lipids, nucleic acids Cell structure: prokaryotic and eukaryotic cells Modes of reproduction, growth, and development Energy and cellular physiology: photosynthesis and cellular respiration Homeostasis and homeostatic mechanisms Evolution and adaptation of marine organisms Abiotic factors affecting marine organisms Salinity Temperature Surface-to-volume ratio Pressure Light Feeding Buoyancy Classification of organisms using taxonomy and phylogeny Survey of Marine Organisms Marine microorganisms Multicellular primary producers Multicellular algae Marine flowering plants Subtidal: sea grasses Intertidal: mangroves and salt marshes Marine invertebrates: characteristics and representative organisms Protozoans Porifera Cnidaria/Ctenophora Platyhelminthes Nematoda Bryozoa Mollusca Annelida Pogonophora Arthropoda Echinodermata Invertebrate chordates Marine vertebrates: characteristics and representative organisms Fishes Chondrichthyes Actinopterygii Sarcopterygii Marine reptiles Marine birds Marine mammals Evolutionary relationships Challenges of Life at Sea Nutrient and gas procurement Internal transport and regulation of body fluids Coordination and locomotion Behavior and social biology Schooling behavior Migration (oceanic, vertical, orientation) Marine Ecology Population biology of marine organisms Organization of marine communities and ecosystems Patterns of energy and material transfer Trophic relations Material cycles Adaptation and the niche concept Larval dispersal Organism-sediment relations Production in the sea Primary production and photosynthesis Secondary production, respiration, and consumption Factors affecting production Marine ecosystems Rocky intertidal Sandy beaches Marshes and estuaries Kelp forests Coral reefs The abyss Human Impact on the Ocean Eutrophication and urbanization Conservation strategies for marine species and habitats Fisheries Sustainable yields Over-exploitations Marine pollution Global climate change and the role of the ocean

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Reading Assignments

Textbook Scientific journal articles

Writing Assignments

Essays, through homework and examination Individual or group reports

Out-of-class Assignments

Individual or group presentations Pre- or post-lecture assessments or quizzes Preparation of written/oral summaries of reading assignments Completion of worksheets, study guides, or other study materials

Demonstration of Critical Thinking

During this course, students are asked to discuss events occurring in Southern California and around the world using concepts learned in the course and external resources to defend their stance and evaluation. Additional assignments, will require students to interpret relevant primary literature and data presented in lectures, readings, discussions, and/or direct observations to construct comparisons, draw conclusions, and make predictions.

Required Writing, Problem Solving, Skills Demonstration

Students will meet this requirement though homework assignments and a series of short-response questions on midterms and final exams that demonstrate proficiency in course objectives. Research project(s) will ask students to prepare and present a written scientific library based research report. Topics include a critical evaluation of a current event, topical article in marine biology, or evaluation of a current or hypothetical conservation plan.

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 Castro, B., Huber, H.. Marine Biology, 12th ed. McGraw-Hill, 2024