



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	BIOL
Course Number:	17
Descriptive Title:	Marine Biology
Division:	Natural Sciences
Department:	Biology
Course Disciplines:	Biological Sciences
Catalog Description:	This is an introductory marine biology lecture course exploring biological principles and structure, function and adaptation for marine life. It includes a review of the history of marine biology and a discussion of local species of marine plants and animals and major marine communities. Human interaction and impact on the ocean is also discussed
Prerequisite:	
Co-requisite:	
Recommended Preparation:	Eligibility for ENGL C1000 or equivalent
Enrollment Limitation:	
Hours Lecture (per week):	3
Hours Laboratory (per week):	0
Outside Study Hours:	6
Total Course Hours:	54
Course Units:	3
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	Prior to 07/1992
Transfer UC:	Yes
Effective Date:	
General Education: ECC	Area 1 - Natural Sciences
Term:	
Other:	
CSU GE:	Area B2 - Physical Universe and its Life Forms: Life Science
Term:	
Other:	

	IGETC: Area 5B - Biological Science
	Term:
	Other:
	CalGETC:
	Term:
	Other:
Student Learning Outcomes:	SLO #1 Scientific Method The student will understand and apply principles of the scientific method; recognizing an idea based on reproducible evidence. SLO #2 Content Knowledge (Energy Flow) Students will use basic energy principles to explain the flow of energy in living systems, such as those that occur in the cellular metabolic pathways of photosynthesis and cell respiration, or the relationships observed between autotrophs and heterotrophs in ecosystems. SLO #3 Content Knowledge (Materials Cycling) Students will describe how biologically significant materials move between the biotic and abiotic components of an ecosystem and the role living things play in the cycling of these nutrients.
Course Objectives:	1. Discuss historical events and the contributions of major individuals in the field of marine biology. 2. Discuss the unique properties of water and how it is affected by salt. Describe animal and plant adaptations to salt water. 3. Explain basic principles of and evidence for plate tectonics. 4. Discuss basic principles of ecology such as energy flow, food webs, nutrient cycling, photosynthesis, cellular respiration, population regulation, competition, and the importance of predation. 5. Describe symbiotic relationships of mutualism, commensalism, and parasitism using marine examples. 6. Name and discuss several anatomical structures and physiological functions of selected marine organisms and their role in adaptation to marine life. 7. Explain the general concepts of classification and evolutionary trends of plants and animals of the ocean. 8. Discuss each of the major life regions in the ocean and the adaptations organisms have made to living where they do. Examples of these include: a. Plankton of the epipelagic, their productivity, buoyancy and dispersal techniques b. Nekton of the epipelagic, their buoyancy, camouflage, salt regulation and thermal dynamics c. Shallow water benthic associations; kelp beds; coral reefs d. Intertidal and estuary communities, ecotones, euryhaline environments 9. Describe several human caused problems of the past and present and possible solutions. Examples of these include: 10. Over-fishing problems relating to fish, invertebrates and marine mammals 11. Marine reserves and protected species and habitats 12. Plastic pollution and destruction of marine life 13. Anaerobic dead zones

	14. Destructive fishing strategies
Major Topics:	I. Introduction to Marine Biology/classification of living things Classification (3 hours, lecture) A. History B. Binomial scientific name C. Evolutionary Principles II. History of Marine Biology/plate tectonics and the sea floor (3 hours, lecture) A. Early Pioneers in the Field B. Geologic Forces and Processes 1. Plate Tectonics 2. Erosion 3. Volcanism C. Ocean Floor Characterization 1. Subduction Zones 2. Trenches 3. Ridges III. Chemical and physical features of ocean (3 hours, lecture) A. States of Matter 1. Solid 2. Liquid 3. Gas C. Ocean Chemistry 1. Salinity 2. pH 3. Density/Pressure IV. Chemistry of Life (3 hours, lecture)

A. Organic Biomolecules

1. Carbohydrates
2. Lipids
3. Proteins
4. Nucleic Acids

V. Photosynthesis/ cell respiration (3 hours, lecture)

- A. Light, Pigments, Water, and Carbon Dioxide
- B. Pathways to Utilize Carbohydrates

VI. Cellular structure, function, reproduction (3 hours, lecture)

- A. Cell membrane
- B. Nucleus
- C. Other organelles
- D. Cell Division Pathways

VII. Prokaryotic Domains of life (formerly Monera) and eukaryotic Protista (including marine algae) (3 hours, lecture)

- A. Prokaryotic Domains
1. Bacteria
 2. Archaea
- B. Eukaryotic Domain
1. Unicellular Forms
 2. Colonial Forms
 3. Multicellular Forms

VIII. Protozoa, Sponges, Cnidarians (3 hours, lecture)

- A. Feeding Modes in Protozoa
- B. Sponges
1. Cell Types

2. Framework
3. Body Symmetry
4. Classes of Sponges

C. Cnidaria

1. Body Design
2. Diploblastic Tissues
3. Cnidocytes
4. Classes of Cnidaria

IX. Mollusca/Annelida (3 hours, lecture)

A. Mollusca

1. Mantle
2. Shell
3. Sensory organs
4. Mollusc Classes

B. Annelida

1. Segmentation
2. Coelomic Cavity
3. Reproduction
4. Classes of Annelida

X. Arthropoda/Echinodermata (3 hours, lecture)

A. Arthropoda

1. Chelicerata
2. Crustacea

B. Echinodermata

1. Deuterostome Design
2. Endoskeleton

3. Classes of Echinoderms

XI. Jawless and Cartilaginous fish (3 hours, lecture)

A. Chordate Characters

B. Origin of Subphylum Vertebrata

C. Agnatha

D. Cartilaginous Fish

XII. Bony fish biology and reproduction (3 hours, lecture)

A. Endoskeleton

B. Ray Fins

C. Lobe Fins

XIII. Marine birds and reptiles - Evolution and adaptations (3 hours, lecture)

A. Reptiles

1. Turtles

2. Crocodilians

3. Lizards

B. Modifications for Ocean

1. Salt Glands

2. Appendages and Locomotion

3. Reproduction

C. Birds

1. Salt Glands

2. Appendages and Locomotion

3. Reproduction

XIV. Marine mammals - Evolution and adaptations (3 hours, lecture)

A. Body Modifications

B. Feeding modes

	1. Herbivores/Algae Eaters 2. Plankton Feeders 3. Carnivores XV. Over-fishing and destructive techniques (3 hours, lecture) A. Fishing and Fish Farming Practices B. Shellfish Practices XVI. Marine reserves, conservation (3 hours, lecture) A. National Parks B. World Heritage Sites C. Conservation Groups D. Impacts at the Local and Individual Level
Total Lecture Hours:	54
Total Laboratory Hours:	0
Total Hours:	54
A.1. Primary Methods of Evaluation (Part 1 - CCN courses only):	
A.2. Primary Method of Evaluation (Part 2 - all courses; choose one):	1) Substantial writing assignments
Typical Assignment Using Primary Method of Evaluation:	Periodical Report: Read and analyze two journal articles on marine biology. The reports will consist of a one page summary and an evaluation of each article. Critique the content and relate it to what we have discussed in class.
Critical Thinking Assignment 1:	Essay Question: Describe how the typical mammalian body characteristics have evolved to be adapted to the marine environment citing examples of those characteristics in local species.
Critical Thinking Assignment 2:	Essay Question: Name and describe three characteristics that enable birds to fly. How have these same characteristics been modified for marine life?
Other Evaluation Methods:	Essay Exams, Homework Problems, Multiple Choice, Objective Exam, Other Exams, Quizzes, Reading Reports, Term or Other Papers, True/False, Completion, Matching Items
Instructional Methods:	Discussion, Lecture, Multimedia presentations
If other:	Internet Presentation/Resources
Work Outside of Class:	Journal (done on a continuing basis throughout the semester), Observation of or participation in an activity related to course content (such as theatre event, museum,

	concert, debate, meeting), Required reading, Study, Written work (such as essay/composition/report/analysis/research)
If Other:	
Up-To-Date Representative Texts:	Castro and Huber. <u>Marine Biology</u> . 12th ed. McGraw-Hill, 2023. Morrissey, Sumich, and Pinkard-Meier. <u>An Introduction to the Biology of Marine Life</u> . 11th ed. Jones and Bartlett Learning, 2018. <i>Discipline Standard</i> .
Alternative Texts:	
Required Supplementary Readings:	In selected journals
Other Required Materials:	
Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	
Requisite course:	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	Eligibility for ENGL C1000 or qualification by appropriate assessment.
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable	Students will be able to write a paragraph, essay, or paper about taxonomic classifications, such as between groups of worms, or about contrasting body systems strategies in animal groups, such as those between open and closed circulatory systems. Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process. A student needs to have good reading skills to understand and write an in-class essay as part of the unit exam.

	Summarize, analyze, and synthesize college-level texts. Students need to be able to write a paragraph, essay, or paper about a technical subject. Write a well-reasoned, well-supported expository essay including an introduction and conclusion, exhibiting the application of the academic writing process.
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Jeanne Bellemin
Date:	10/22/1982
Original Board Approval Date:	
Last Reviewed and/or Revised by:	Eduardo Ayala
Date:	11/10/2025
Last Board Approval Date:	01/21/2026
Effective Term:	FA 2026