



El Camino College
COURSE OUTLINE OF RECORD - Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Biology 17
Descriptive Title: Marine Biology
Course Disciplines: Biological Sciences
Division: Natural 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.

Conditions of Enrollment:

Recommended Preparation: English 1 or eligibility for English 1A or qualification by appropriate assessment.

Course Length:	X Full Term	Other (Specify number of weeks):
Hours Lecture:	3.00 hours per week	TBA
Hours Laboratory:	0 hours per week	TBA
Course Units:	3.00	

Grading Method: Letter
Credit Status: Associate Degree Credit

Transfer CSU: X Effective Date: Prior to July 1992
Transfer UC: X Effective Date: Prior to July 1992

General Education:

El Camino College:
1 – Natural Sciences

Term: _____ Other: _____

CSU GE:
B2 - Life Science

Term: _____ Other: Approved

IGETC:
5B - Biological Science without a Lab

Term: Fall 1991 _____ Other: _____

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. The student will understand and apply principles of the scientific method; recognizing an idea based on reproducible evidence.
2. 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.
3. 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

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

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:
 - Plankton of the epipelagic, their productivity, buoyancy and dispersal techniques
 - Nekton of the epipelagic, their buoyancy, camouflage, salt regulation and thermal dynamics
 - Shallow water benthic associations; kelp beds; coral reefs
 - 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:
 - Over-fishing problems relating to fish, invertebrates and marine mammals
 - Marine reserves and protected species and habitats
 - Plastic pollution and destruction of marine life
 - Anaerobic dead zones
 - Destructive fishing strategies

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	3	I	Introduction to Marine Biology/classification of living things Classification A. History B. Binomial scientific name C. Evolutionary Principles
Lecture	3	II	History of Marine Biology/plate tectonics and the sea floor 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
Lecture	3	III	Chemical and physical features of ocean A. States of Matter 1. Solid 2. Liquid 3. Gas C. Ocean Chemistry 1. Salinity 2. pH 3. Density/Pressure
Lecture	3	IV	Chemistry of Life A. Organic Biomolecules 1. Carbohydrates 2. Lipids 3. Proteins 4. Nucleic Acids
Lecture	3	V	Photosynthesis/ cell respiration A. Light, Pigments, Water, and Carbon Dioxide B. Pathways to Utilize Carbohydrates
Lecture	3	VI	Cellular structure, function, reproduction A. Cell membrane B. Nucleus C. Other organelles D. Cell Division Pathways
Lecture	3	VII	Prokaryotic Domains of life (formerly Monera) and eukaryotic Protista (including marine algae) A. Prokaryotic Domains 1. Bacteria 2. Archaea B. Eukaryotic Domain

			<ol style="list-style-type: none"> 1. Unicellular Forms 2. Colonial Forms 3. Multicellular Forms
Lecture	3	VIII	<p>Protozoa, Sponges, Cnidarians</p> <p>A. Feeding Modes in Protozoa</p> <p>B. Sponges</p> <ol style="list-style-type: none"> 1. Cell Types 2. Framework 3. Body Symmetry 4. Classes of Sponges <p>C. Cnidaria</p> <ol style="list-style-type: none"> 1. Body Design 2. Diploblastic Tissues 3. Cnidocytes 4. Classes of Cnidaria
Lecture	3	IX	<p>Mollusca/Annelida</p> <p>A. Mollusca</p> <ol style="list-style-type: none"> 1. Mantle 2. Shell 3. Sensory organs 4. Mollusc Classes <p>B. Annelida</p> <ol style="list-style-type: none"> 1. Segmentation 2. Coelomic Cavity 3. Reproduction 4. Classes of Annelida
Lecture	3	X	<p>Arthropoda/Echinodermata</p> <p>A. Arthropoda</p> <ol style="list-style-type: none"> 1. Chelicerata 2. Crustacea <p>B. Echinodermata</p> <ol style="list-style-type: none"> 1. Deuterostome Design 2. Endoskeleton 3. Classes of Echinoderms
Lecture	3	XI	<p>Jawless and Cartilaginous fish</p> <p>A. Chordate Characters</p> <p>B. Origin of Subphylum Vertebrata</p> <p>C. Agnatha</p> <p>D. Cartilaginous Fish</p>
Lecture	3	XII	<p>Bony fish biology and reproduction</p> <p>A. Endoskeleton</p> <p>B. Ray Fins</p> <p>C. Lobe Fins</p>
Lecture	3	XIII	<p>Marine birds and reptiles - Evolution and adaptations</p> <p>A. Reptiles</p> <ol style="list-style-type: none"> 1. Turtles 2. Crocodilians 3. Lizards <p>B. Modifications for Ocean</p>

			1. Salt Glands 2. Appendages and Locomotion 3. Reproduction C. Birds 1. Salt Glands 2. Appendages and Locomotion 3. Reproduction
Lecture	3	XIV	Marine mammals - Evolution and adaptations A. Body Modifications B. Feeding modes 1. Herbivores/Algae Eaters 2. Plankton Feeders 3. Carnivores
	3	XV	Over-fishing and destructive techniques A. Fishing and Fish Farming Practices B. Shellfish Practices
Lecture	3	XVI	Marine reserves, conservation 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	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Substantial writing assignments

B. 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.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

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.
2. Essay Question: Name and describe three characteristics that enable birds to fly. How have these same characteristics been modified for marine life?

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Essay exams
Objective Exams
Other exams
Quizzes
Reading reports
Homework Problems
Term or other papers
Multiple Choice
Completion
Matching Items
True/False
Other (specify):
 Short essay questions

V. INSTRUCTIONAL METHODS

Discussion
Internet Presentation/Resources
Lecture
Multimedia presentations

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study
Required reading
Written work
Journal
Observation of or participation in an activity related to course content

Estimated Independent Study Hours per Week: 6

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Castro and Huber. Marine Biology. 11th ed. McGraw- Hill. 2019.
Morrissey, Sumich, and Pinkard-Meier. An Introduction to the Biology of Marine Life.
11th ed. Jones and Bartlett Learning, 2018.

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

In selected journals

D. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
------------	----------------------------

B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
<p>Non-Course Recommended Preparation</p> <p>English 1 or eligibility for English 1A or qualification by appropriate assessment.</p>	<p>Marine Biology lecture students are required to read and comprehend the textbook and are evaluated with the use of writing assignments on exams and assigned papers. The reading skills of English 1 will prepare the student to successfully complete the course.</p> <p>Students are required to read a college level textbook, therefore, the reading skills developed in English 84 will greatly enhance their chance for successfully completing this course.</p> <p>Students in this course are required to use critical thinking skills to write essays. The skills developed in English 1 will increase their ability to complete these assignments and will greatly enhance their chances for overall success in this course.</p>

D. Recommended Skills

Recommended Skills
<p>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.</p> <p>ENGL 1 – Write a well-reasoned, well-supported expository essay that demonstrates application of the academic writing process.</p>
<p>A student needs to have good reading skills to understand and write an in-class essay as part of the unit exam.</p> <p>ENGL 1 – Summarize, analyze, and synthesize college-level texts.</p> <p>Students need to be able to write a paragraph, essay, or paper about a technical subject.</p> <p>ENGL 1 - Write a well-reasoned, well-supported expository essays including an introduction and conclusion, exhibiting the application of the academic writing process.</p>

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
-------------------------------------	-------------------------------

Course created by Jeanne Bellemin on 10/22/1982.

BOARD APPROVAL DATE:

LAST BOARD APPROVAL DATE: 01/21/2020

Last Reviewed and/or Revised by: Bryan Carey

Date: 10/31/19

18410