

Course Outline

COURSE: BIO 13 **DIVISION:** 10 **ALSO LISTED AS:**

TERM EFFECTIVE: Fall 2021 **CURRICULUM APPROVAL DATE:** 12/14/2021

SHORT TITLE: MARINE BIOLOGY

LONG TITLE: Marine Biology

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
4	18	Lecture:	3	54
		Lab:	3	54
		Other:	0	0
		Total:	6	108

COURSE DESCRIPTION:

The course provides an overview of marine ecosystems, emphasizing the diversity of life inhabiting them. The physical, chemical, and ecological features of the marine environment are reviewed and the evolutionary adaptations that allowed marine organisms to survive are emphasized. Although the overall focus will include ecosystems found in both tropical, subtropical, temperate, and arctic regions, many of the practical examples will be drawn from the rich ecosystems of the central California coast, and labs will provide hands-on experience of the diversity of life found in this area. Practical exercises will include viewing of specimen in the laboratory, short documentaries followed by discussion, and field trips to coastal locations within the Monterey Bay to view and explore specific ecosystems such as kelp forests, the intertidal, and estuarine areas, as well as learn about local marine species such as birds and mammals. **ADVISORY:** High school-level reading and writing skills, and skills equivalent to those of an Elementary Algebra course.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

- 02 - Lecture and/or discussion
- 03 - Lecture/Laboratory
- 04 - Laboratory/Studio/Activity
- 04B - Laboratory - LEH 0.75
- 05 - Hybrid
- 71 - Dist. Ed Internet Simultaneous
- 72 - Dist. Ed Internet Delayed
- 73 - Dist. Ed Internet Delayed LAB
- 73B - Dist. Ed Internet LAB-LEH 0.75

STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Explain, apply, and communicate the scientific method.
2. Describe the physical constraints of the marine environment and describe how organisms have evolved adaptations to cope with these constraints.
3. Describe how communities of marine organisms interact with each other and their physical environment.
4. Describe the impacts of humans on marine ecosystems and ecosystem services, and describe ways in which we can reduce our impact.

COURSE OBJECTIVES:

By the end of this course, a student should:

1. Discuss basic physical oceanography phenomena such as tides, currents, general oceanic circulation, thermoclines and waves.
2. Explain how oceans influence climate.
3. Describe kelp forests and their role as areas of high diversity and productivity.
4. List the main classes of invertebrates and their adaptations.
5. Describe a typical community of the upper, middle, and lower intertidal.
6. Describe the basic classification of fishes and their adaptations to specific environments.
7. Explain the issues associated with light, pressure, salinity, temperature, oxygen and food supply.
8. Discuss the relationship between plants, animals, and bottom sediments.
9. Describe the basic properties of seawater such as chemical composition, physical and chemical properties.
10. Discuss the geography and geomorphology of the oceans, the location of the major ocean basins and their characteristics, temperature and vertical stratification and the circulation patterns of water masses.
11. Discuss the ecological and commercial importance of estuaries.
12. Explain the adaptations of large marine vertebrates (sharks, sea turtles, marine birds and mammals) to salt water.
13. Describe human impacts on tropical communities and arctic ecosystems.

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Curriculum Approval Date: 12/14/2021

LECTURE CONTENT:

6 Hours

CONTENT: Intro to the science of marine biology (3 hours), including the scientific method (3 hours)

3 Hours

CONTENT: Geological oceanography basics

3 Hours

CONTENT: Physical, chemical, and biological oceanography basics

4 Hours

CONTENT: Fundamentals of biology, including cell structure and function

3 Hours

CONTENT: Marine algae and plants

9 Hours

CONTENT: Marine invertebrate animals

3 Hours

CONTENT: Marine fishes

3 Hours

CONTENT: Marine reptiles, birds, and mammals

6 Hours

CONTENT: Intertidal communities (3 hours), including estuaries (3 hours)

6 Hours

CONTENT: Deep sea (3 hours), including benthic ecology (3 hours)

6 Hours

CONTENT: Human impacts on marine ecosystems (3 hours), including tropical and arctic ecosystems (3 hours)

2 Hours

Final Exam

LAB CONTENT:

3 Hours

CONTENT: The scientific method

3 Hours

CONTENT: Properties of seawater, currents, and wind

3 Hours

CONTENT: Web learning tools for oceanography, weather and tides

3 Hours

CONTENT: Microscopy

6 Hours

CONTENT: Phytoplankton and zooplankton

3 Hours

CONTENT: Phycology: algae form and function

6 Hours

CONTENT: Marine invertebrate animals

6 Hours

CONTENT: Sandy beach monitoring (3 hours) and data analysis (3 hours) with the LiMPETS program

3 Hours

CONTENT: Adaptations of fishes

3 Hours

CONTENT: Field trip to Monterey Bay Aquarium

3 Hours

CONTENT: Field trip to Elkhorn Slough

3 Hours

CONTENT: Rocky intertidal monitoring with the LiMPETS program

6 Hours

CONTENT: Deep sea ecology (3 hours), including deep-sea hydrothermal vents (3 hours)

3 Hours

CONTENT: Our changing planet (human impact on marine ecosystems)

METHODS OF INSTRUCTION:

Instruction will use lecture with audio-visual aids, laboratory exercises and field studies.

OUT OF CLASS ASSIGNMENTS:

Assignment

Required Outside Hours 108

Assignment Description

Reading from textbook, written homework, projects, papers

METHODS OF EVALUATION:

Writing assignments

Evaluation Percent 55

Evaluation Description

Percent range of total grade: 50-60%

Written Homework

Reading Reports

Lab Reports

Essay Exams

Term or Other Papers

Problem-solving assignments

Evaluation Percent 35

Evaluation Description

Percent range of total grade: 30-40%

Field Work

Lab Reports

Quizzes

Exams

Skill demonstrations

Evaluation Percent 10

Evaluation Description

Percent range of total grade: 5-15%

Class Performance/s

REPRESENTATIVE TEXTBOOKS:

Marine Biology, 11e., P. Castro and M. Huber, McGraw-Hill, 2018.

ISBN: 9781260085105

Reading level of text: grade 13 Grade Verified by: MS Word

In-house lab manual developed by Josi Taylor. Updated annually.

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

GAV B2, effective 201070

GAV B3, effective 201070

CSU GE:

CSU B2, effective 201070

CSU B3, effective 201070

IGETC:

IGETC 5B, effective 201070

IGETC 5C, effective 201070

CSU TRANSFER:

Transferable CSU, effective 201070

UC TRANSFER:

Transferable UC, effective 201070

SUPPLEMENTAL DATA:

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department:

CSU Crosswalk Course Number:

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: E

Maximum Hours:

Minimum Hours:

Course Control Number: CCC000359031

Sports/Physical Education Course: N

Taxonomy of Program: 049900