Ocean Biology

SCIH039057
Credits: 0.5 units / 5 hours | NCAA Approved

Course Description

This course incorporates several basic themes as it covers the life in our world's oceans. One of the primary themes of this course is the vast diversity, structure, function, and ecology of organisms in the world's oceans. Students will also learn to relate the physical sciences to the study of marine life. Particular attention is paid to the challenges that marine organisms face in changing ecosystems and to the interactions of humans with the marine environment. This is a somewhat challenging advanced-level course that builds on the concepts taught in high school Biology and Physical and Earth Sciences, with a focus on the marine environment.

Assessments

4 Unit Evaluations, 3 Projects, 3 Progress Tests, 4 Teacher Connect Activities

Course Objectives

There are more specific objectives listed individually in each lesson, but the ultimate goal is that, by the end of the course, you will know and use these facts, concepts, principles, theories, and models to gain a better grasp on the following and be able to:

1. Explain the highlights of the history of marine biology and some of the current developments in the field.
2. Describe the evidence to support that plate tectonics is responsible for the origin and geologic structure of the ocean basins.
3. Demonstrate an understanding of the basic chemical and physical properties of seawater and how those properties impact ocean circulation.
4. Review some of the basic principles of biology such as cell structure and function, asexual and sexual reproduction, evolution and taxonomy.
5. Describe how organisms adapt to the marine environment.
6. Discuss the most important morphological characteristics and explain the ecological significance of marine viruses, prokaryotes, seaweed, marine flowering plants, marine invertebrates and chordates, and marine vertebrates.
7. Discuss how species interact in the ocean environment.
8. Describe the flow of energy and nutrients through different trophic levels.
9. Compare and contrast between the major types of estuaries, their physical characteristics and the organisms that inhabit them.
10. Discuss the types of organisms and their role in subtidal, intertidal and sandy beach communities and how organisms adapt to those environments.

11. Explain the most important factors influencing the development, growth, and geographical distribution of coral reefs.
12. Summarize the ecological interactions occurring in ocean.
13. Explain the basic geographic and seasonal patterns of primary productivity.
14. Compare and contrast between epipelagic and mesopelagic organisms and those living below the mesopelagic.
15. Discuss the human impact on the marine environment as well as the ocean's influence on human culture throughout history.

Course Outline

Unit 1: Principles of Marine Science

Teacher Connect Activity 1
Lesson 1: The science of Marine Biology
Lesson 2: The Sea Floor
Lesson 3: Chemical and Physical Features of Seawater
Lesson 4: Fundamentals of Biology
Unit 1 Evaluation
Project 1
Progress Test 1

Unit 2: The Organisms of the Sea

Lesson 5: The Microbial World
Lesson 6: Multicellular Primary Producers
Lesson 7: Marine Animals without a Backbone
Lesson 8: Marine Fishes
Lesson 9: Marine Reptiles, Birds, and Mammals
Unit 2 Evaluation
Teacher Connect Activity 2
Progress Test 2

Unit 3: Structure and Function of Marine Ecosystems

Lesson 10: Introduction to Marine Ecology
Lesson 11: Between the Tides
Lesson 12: Estuaries: Where Rivers Meet the Sea
Lesson 13: Life on the Continental Shelf
Lesson 14: Coral Reefs
Lesson 15: Life near the Surface
Lesson 16: The Ocean Depths
Unit 3 Evaluation
Teacher Connect Activity 3
Project 2

Unit 4: Humans and the Sea

Lesson 17: Resources from the Sea
Lesson 18: The Impact of Humans on the Marine Environment
Unit 4 Evaluation
Teacher Connect Activity 4
Project 3
Progress Test 3

Required Textbook and Materials

(available through Follett virtual bookstore at http://highschool.nebraska.bkstr.com)

Textbook: Marine Biology, 11th ed., Peter Castro and Michael E. Huber, McGraw-Hill. 2019.

(Loose-Leaf version: ISBN: 9781260162578; paperback: 978-1260085105; hardcover: 978-1259880032)