

## **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: 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

Review for 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

Review for 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

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

Lesson 19: The Oceans and Human Affairs

Unit 4 Evaluation

Teacher Connect Activity 4

Project 3

Review for Progress Test 3

**Required Textbook and Materials**  
(available through Follett virtual bookstore at  
<http://www.bkstr.com/nebraskahighschoolstore>)

Textbook: *Marine Biology, 11<sup>th</sup> edition*. (Loose-Leaf version: ISBN: 9781260162578; paperback: 978-1260085105; hardcover: 978-1259880032)

*Ocean Biology* Course Content SCIH039057 is the print version of the online course content. This print content is **optional** for this course.