

**University of Arkansas - Fort Smith**  
**5210 Grand Avenue**  
**P. O. Box 3649**  
**Fort Smith, AR 72913-3649**  
**479-788-7000**

**General Syllabus**

**BIOL 3453 Marine Ecosystems**

Credit Hours: 3

Lecture Hours: 3

Laboratory Hours: 0

Prerequisites: BIOL 1153 Biological Science or BIOL 2003 Introduction to Cell Biology or BIOL 2013 Introduction to Organismal Biology

Effective Catalog: 2018- 2019

**I. Course Information**

**A. Catalog Description**

A survey of oceanography, marine biodiversity and ecosystems, and the impact of humans on the world's oceans.

**B. Additional Information - None**

**II. Student Learning Outcomes:**

**A. Subject Matter**

Upon successful completion of this course, the student will be able to:

1. Use the fundamentals of oceanography to solve problems, criticize opinions, and defend a position.
2. Construct a phylogenetic tree diagram of marine biodiversity, including microbes, primary producers, invertebrates, fish, reptiles, birds, and mammals.
3. Differentiate from among the several types of marine ecosystems, including intertidal communities, estuaries, coral reefs, continental shelves, the neritic zone, the open sea, and the ocean's depths.
4. Appraise the ethics of the way humans interact with marine ecosystems. Be able to criticize and defend these interactions in a debate.

**B. University Learning Outcomes**

This course enhances student abilities in the following areas:

**Analytical Skills**

**Critical Thinking Skills:** Students will utilize analytical skills to identify a problem, break it down into its component parts, and use scientific method to answer biological questions.

**Communication Skills (written and oral)**

Students will demonstrate proficiency in communication by composing coherent arguments presented both orally and in writing.

**Ethical Decision Making**

Students will identify ethical dilemmas (e.g., pollution, ocean acidification, marine aquaculture, whaling, etc.) and apply ethical frameworks in discussions about these issues.

**Global and Cultural Perspectives**

Students will demonstrate (1) the application of the science of biology in a global environment, and (2) how interacting with nature may impact societies and cultures, biological communities, and ecosystems around the world.

**III. Major Course Topics**

- A. Oceanography & Marine ecology
  - 1. Oceanography in brief
  - 2. Climate oscillations & climate change
  - 3. Ecology and evolution in a marine ecosystem
- B. Life in the oceans of Earth
  - 1. The environment
  - 2. The nature of ocean water
  - 3. Behavior of marine life
- C. Life in the Open Sea
  - 1. Plankton
  - 2. Vertebrates
  - 3. Distributions and adaptations
- D. The Water Column
  - 1. Processes
  - 2. Productivity & food webs
- E. The Sea Bed
  - 1. Benthic microorganisms, algae, & plants
  - 2. Benthic invertebrates
  - 3. Benthic communities
- F. Coastal Communities
  - 1. Tidal ecosystems
  - 2. Subtidal ecosystems
- G. Transition from Shelf to Deep Sea
  - 1. Benthos
  - 2. Polar regions
  - 3. Biodiversity and conservation

## H. Human Impacts

1. Aquaculture
2. Environmental impacts