

# ESCI 0015 - INTRODUCTION TO OCEANOGRAPHY

## Catalog Description

Advisory: Eligibility for ENGL 1A or equivalent

Hours: 54 lecture

Description: Physical, chemical, and biological aspects of our ocean environment with emphasis on geologic processes. (CSU, UC)

## Course Student Learning Outcomes

- CSLO #1: Integrate the concept of plate tectonics with the formation of ocean basins.
- CSLO #2: Describe the patterns of ocean circulation and relate them to atmospheric phenomena.
- CSLO #3: Describe the physical characteristics of seawater and its influence on ecosystems.

## Effective Term

Fall 2018

## Course Type

Credit - Degree-applicable

## Contact Hours

54

## Outside of Class Hours

108

## Total Student Learning Hours

162

## Course Objectives

Students will successfully:

1. describe the events that encompass the history of ocean exploration;
2. evaluate the significance of the early contributions to ocean science, such as those from Darwin and Agassiz;
3. assess the relevance of the contributions to the science of oceanography during the twentieth century;
4. distinguish the steps in the formation of the universe and our planet;
5. appraise the relevance of oxygen and the first organic substances in the origin of life;
6. describe the evolution of life on Earth;
7. discuss the evidence presented in support of continental drift and the reasons this hypothesis was not elevated to the status of scientific theory;
8. compare and contrast the hypothesis of continental drift with the theory of plate tectonics;
9. integrate the concept of plate tectonic boundaries with processes that create the ocean basins;
10. identify the components of the ocean floor in a plate tectonic framework;
11. analyze the distribution and characteristics of saltwater bodies on Earth;

12. identify the characteristics of marine provinces;
13. relate marine sediments to their source;
14. categorize marine sediments based on their texture and composition;
15. describe the physical and chemical characteristics of seawater;
16. examine the interaction between the oceans and the atmosphere;
17. describe the patterns of global ocean circulation and relate them to atmospheric circulation;
18. describe the characteristics of wind waves and explain their interaction with the coastline environment;
19. relate the generation of tides to astronomical parameters and explain their interaction with the coastline environment;
20. categorize marine life according to habitat;
21. relate marine organisms to the physical environment in which they live;
22. evaluate marine laws and regulations; and
23. describe polluting agents and examine their effect on the marine environment.

## General Education Information

- Approved College Associate Degree GE Applicability
  - AA/AS - Physical Sciences
- CSU GE Applicability (Recommended-requires CSU approval)
  - CSUGE - B1 Physical Science
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)
  - IGETC - 5A Physical Science

## Articulation Information

- CSU Transferable
- UC Transferable

## Methods of Evaluation

- Objective Examinations
  - Example: Example: Classify a marine sediment with the following components in the given amounts: 20% sand, 30% silt, 50% clay.
- Problem Solving Examinations
  - Example: Example: Select three epifaunal reef organisms and explain their role in the ecosystem.

## Repeatable

No

## Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. Instructor leads in-session discussion on the development of ocean basin mapping over time and guides students through a hands-on exercise in conversion of two-way travel time to ocean depth.
2. Instructor first describes and explains the formation of wind waves and their impact on the coastline, and then guides students in an exercise on determination of beach drift direction based on wave incidence on a hypothetical coastline. Different cases involving changes in the angle of incidence are discussed.

Distance Learning

1. Faculty record lecture videos about features of the continental margin and students complete an assignment identifying the various parts of an active and a passive continental margin.

## **Typical Out of Class Assignments**

### **Reading Assignments**

1. Read the assigned pages from the textbook on marine organisms and be prepared to discuss how their morphology relates to their environment during the class session.
2. Read a professional article on one topic related to marine law and generate a written report in essay format.

### **Writing, Problem Solving or Performance**

1. Write a report on the effect of coastal engineering on the the shore for a specific location of your choice. Include an historical perspective, selecting representative time frames.
2. Calculate ocean depths based on two-time travel data.

### **Other (Term projects, research papers, portfolios, etc.)**

### **Required Materials**

- Introduction to Physical Oceanography
  - Author: Knauss, John, and Garfield, Newell
  - Publisher: Waveland Press
  - Publication Date: 2016
  - Text Edition: 3rd
  - Classic Textbook?:
  - OER Link:
  - OER:

### **Other materials and-or supplies required of students that contribute to the cost of the course.**