

**Semester at Sea Course Syllabus
Colorado State University, Academic Partner**

Voyage: Fall 2017
Discipline: Natural Resources
Course Number and Title: NR 150 Oceanography (Section 1)
Faculty Name: McKeon
Semester Credit Hours: 3

Meeting: B Day 1400-1520, Kino
Prerequisites: None



COURSE DESCRIPTION

Oceanography covers the concepts of geology, chemistry, physics, and biology relevant to the world's oceans. We will describe the ocean basins and the mechanisms that formed them. We will study the physical and chemical properties of seawater and examine the role of the oceans in the carbon cycle. Physical oceanography includes large-scale patterns, ocean circulation, as well as small-scale phenomena such as waves. The geology of the coastal ocean, beaches, and estuaries leads into a discussion of the ocean's major communities and the biotic and physical factors structuring them. Topics of current interest (global warming, coastal development, fisheries, and introduced species, coral bleaching and hydrothermal vents) are presented throughout the course.

LEARNING OBJECTIVES

To understand the basic geological, physical and biological features and processes of the oceans.

To learn how ocean waters are studied.

To develop an appreciation for the diversity and importance of life in the oceans.

To understand how oceanic processes affect the global environment.

REQUIRED TEXTBOOKS

AUTHOR: Tom Garrison
TITLE: *OCEANOGRAPHY: An Invitation to Marine Science*
PUBLISHER: Cengage Learning
ISBN #: 978-1111990855
DATE/EDITION: 2012/8th Edition

AUTHOR: Steinbeck, J
TITLE: *The Log from the Sea of Cortez*
PUBLISHER: Penguin
ISBN #: 978-0140187441
DATE/EDITION:

TOPICAL OUTLINE OF COURSE



Depart Bremerhaven, Germany — September 9: North Sea, North Atlantic.

B1—September 12: Introduction to Oceanography. Chapter 1

Introductions, Syllabus, and Overview

How to Maintain the Log

DVD Ocean World BBC video 50 minutes

B2—September 14: History of Oceanography. Chapter 2

European perspectives on Oceanography

Terminology: Oceans, Seas, Straights
The biology of the Mediterranean, old and new



Barcelona and Valencia, Spain – September 15-18: Mediterranean Sea

B3—September 20: Oceanographic Methods. Chapter 2

How do we study Oceanography from above the water?

Modern relationship between Ocean and Atmosphere- Satellites, Drones, and Drifters

B4—September 22: Earth Origins and Age. Chapter 1

Why do we have liquid water? And what does it mean for our planet?

How old are the oceans?

No Class – September 23

B5—September 25: Earth Structure and Plate Tectonics. Chapter 3

Plates, continental movements, and the shelves

DVD The Deep BBC video 50 minutes



B6—September 26: Ocean Geography. Chapter 4

How do we describe the geography of the ocean? How did the island groups off of North Africa form?

Tema and Takoradi, Ghana — September 27-30: Bight of Benin and Atlantic Ocean

B6—October 1: Ocean Structure. Chapter 6

Density, Chemistry, Temperature

B7—October 4: Ocean Structure. Chapter 6

Density, Chemistry, Temperature continued.

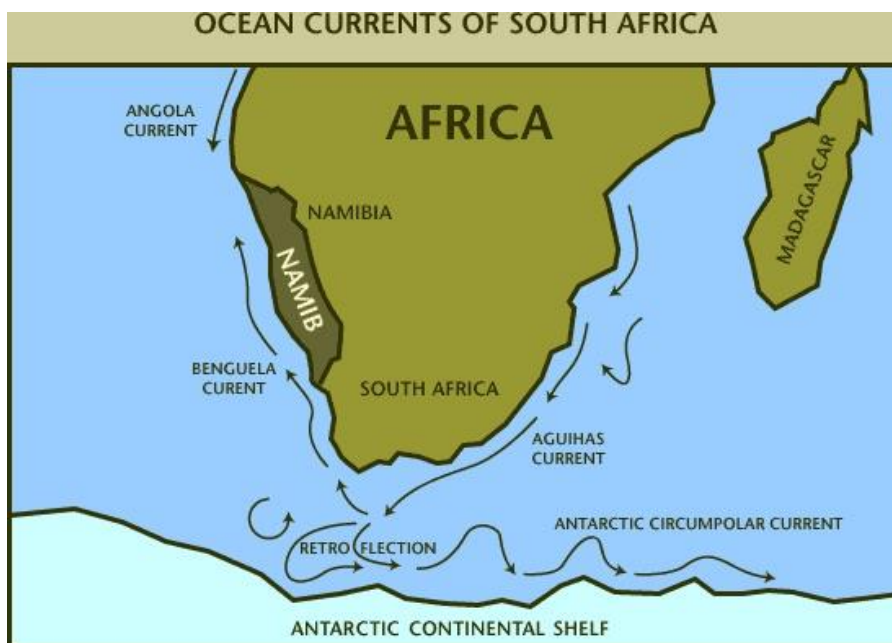
B8—October 6: The interaction between a cold rich ocean, and a desert landscape....

Welcome to the skeleton coast! **Currents and Circulation. Chapter 9**

Currents at play at the tip of Africa, and how these interactions influence the continent

DVD Seasonal Seas BBC video 50 minutes

Cape Town, South Africa — October 7-12: Atlantic Basin meets Pacific Basin



B9—October 14: Currents and Circulation. Chapter 9

Currents of the Indian Ocean and the role of rivers in the ocean.

No Class — October 16

B10—October 17: Islands, Evolution, and Isolation

Port Louis, Mauritius — October 19: Indian Ocean

B11—October 20: Atmosphere/Ocean interactions. Chapter 8

Weather formation and moderation by oceans

No Class – October 22

B12–October 23: MIDTERM



Cochin, India – October 25-30: Indian Ocean, Laccadive Sea

No Class – October 31

B13–November 1: Mud, Mangroves, and Clarity

What are marine forests? Sediment and the role of suspended sediments in Oceanography

B14–November 3: Tides. Chapters 11

Are grunions werewolves? The role of the tides and moon in Oceanography and Marine Biology.

Yangon, Myanmar – November 4-8: Gulf of Martaban

B15–November 10: Marine Life. Chapters 13-16

Starting with the Plankton- Protists and Plants in the water column, How does nitrification work in the Ocean?

No Class – November 11

B16–November 13: Marine Life. Chapters 13-16

The ocean as nursery: Planktonic larval life
DVD Ocean of Islands



Ho Chi Minh City, Vietnam — November 14-18: Bay of Bengal, Gulf of Thailand

B17—November 20: Marine Life. Chapters 13-16
 Why fish? What allows vertebrates to rule the oceans?

No Class – November 21

B18—November 23: Marine Life. Chapters 13-16
 The evolution of Marine reptiles, Birds, and Mammals. Not quite free from land.

Shanghai, China — November 24-29: East China Sea

B19—December 1: Marine Sediments. Chapter 5
 Mining the oceans, oceans as carbon depositories **DVD Ocean of Volcanoes**



Kobe, Japan — December 2-6: Sea of Japan, Pacific Ocean

B20—December 8: Coastlines. Chapter 12

Human uses, impacts, and adaptations

B21—December 10: Coastlines. Chapter 12

Ocean and tidal energy, extraction, farming

B22—December 12: Ocean Conservation. Chapter 17, 18

Overfishing, Pollution, Challenges and Solutions?

B23—December 14: Ocean Conservation. Chapter 17, 18

Overfishing, Pollution, Challenges and Solutions?

DVD Endless Blue



Honolulu, Hawaii — December 16

B24—December 17: Oceans Alive. Thoughts, Lessons, Hope.

Readings from the Logs, Best of Oceanography, Review.

Study Day — December 19

B25—December 20; B Day Finals

San Diego, California — December 23

FIELD WORK

Semester at Sea field experiences allow for an unparalleled opportunity to compare, contrast, and synthesize the different cultures and countries encountered over the course of the voyage. In addition to the one field class, students will complete independent field assignments that span multiple countries.

Field Class attendance is mandatory for all students enrolled in this course. Do not book individual travel plans or a Semester at Sea sponsored trip on the day of your field class. Field Classes constitute at least 20% of the contact hours for each course, and are developed and led by the instructor.

Field Class & Assignment

The Field Class for this course will take place on Thursday, 19 October, in Port Louis, Mauritius.

Class Title: Islands in the Ocean: The formation of Mauritius and its biota

The intent of the field class is to gain first-hand knowledge of how Mauritius was formed geologically, the evolutionary processes acting on its marine and terrestrial biota, and how these processes interact with the Indian Ocean as a whole.

Learning Objectives:

1. To have students seek out a diversity of marine processes, formations and organisms through direct interaction.
2. To experience the processes acting to create and destroy atoll island formations (volcanism, calcification, etc.)
3. To understand the role of oceans in island biogeography
4. To understand how geological and biological forces interact on islands
5. To understand where Mauritius fits into the larger patterns of island formation and biogeography in the Indian Ocean

Students will be evaluated on the basis of a descriptive, collaborative lab report. Teams of students will gather data at each of the two locations and complete an Indian Ocean/Pacific Ocean comparison of coral reefs.

Independent Field Assignments

For Oceanography, all students will maintain an Expedition Log for all days at sea. The log will include all relevant measurements on our course, weather, sea state, oceanographic parameters, marine wildlife sightings in the first part of the entry. The second part of the entry should be descriptive or illustrative in nature, documenting the 'at sea' experience. Any experiences in port that add to the understanding of the marine environment are welcome in the log. Logs will be evaluated on the basis of completion (minority) and effort (majority). At the end of the semester students will select three log entries to be considered for a collaborative Expedition Log.

METHODS OF EVALUATION / GRADING SCALE

GRADING SCALE

The following Grading Scale is utilized for student evaluation. Pass/Fail is not an option for Semester at Sea coursework. Note that C-, D+ and D- grades are also not assigned on Semester at Sea in accordance with the grading system at Colorado State University (the SAS partner institution).

Pluses and minuses are awarded as follows on a 100% scale:

<u>Excellent</u>	<u>Good</u>	<u>Satisfactory/Poor</u>	<u>Failing</u>
97-100%: A+	87-89%: B+	77-79%: C+	Less than 60%:
93-96%: A	83-86%: B	70-76%: C	
90-92%: A-	80-82%: B-	60-69%: D	

ATTENDANCE/ENGAGEMENT IN THE ACADEMIC PROGRAM

Attendance in all Semester at Sea classes, including the Field Class, is mandatory. Students must inform their instructors prior to any unanticipated absence and take the initiative to make up missed work in a timely fashion. Instructors must make reasonable efforts to enable students to make up work which must be accomplished under the instructor's supervision (e.g., examinations, laboratories). In the event of a conflict in regard to this policy, individuals may appeal using established CSU procedures.

LEARNING ACCOMMODATIONS

Semester at Sea provides academic accommodations for students with diagnosed learning disabilities, in accordance with ADA guidelines. Students who will need accommodations in a class, should contact ISE to discuss their individual needs. Any accommodation must be discussed in a timely manner prior to implementation.

A memo from the student's home institution verifying the accommodations received on their home campus is required before any accommodation is provided on the ship. Students must submit this verification of accommodations to academic@isevoyages.org as soon as possible, but no later than two months prior to the voyage.

STUDENT CONDUCT CODE

The foundation of a university is truth and knowledge, each of which relies in a fundamental manner upon academic integrity and is diminished significantly by academic misconduct. Academic integrity is conceptualized as doing and taking credit for one's own work. A pervasive attitude promoting academic integrity enhances the sense of community and adds value to the educational process. All within the University are affected by the cooperative commitment to academic integrity. All Semester at Sea courses adhere to this Academic Integrity Policy and Student Conduct Code.

Depending on the nature of the assignment or exam, the faculty member may require a written declaration of the following honor pledge: "I have not given, received, or used any unauthorized assistance on this exam/assignment."

RESERVE BOOKS AND FILMS FOR THE LIBRARY

BBC Natural History Documentary Series:

Blue Planet
Earth: The biography
Wild Pacific

ADDITIONAL RESOURCES

- Students will require access to shipboard charts, oceanographic, and weather data.
- Students will require access to at least a few pairs of decent binoculars on board
- Field activity dependent, students will need appropriate gear to explore shorelines- closed toe shoes, swimwear, snorkeling gear, collection materials, etc.

