

Introduction to Oceanography

Textbook: Ocean Studies, Introduction to Oceanography, 4th ed. By Douglas A. Segar, Stacy W. Kish, and Elizabeth W. Mills. Published by the American Meteorological Society. Please get a copy if possible; 1 copy each will be on hold in the library, my office, and the department's office for use on campus.

Instructor: Dr. Jay Brett, (email), (office)

Office hours:

Course description:

This course introduces the physical, chemical, geological, and biological foundations for understanding the world ocean. It is one option for an introductory course in Earth Science, fulfills the quantitative reasoning curriculum requirement, and provides students with practice in verbal presentations. In this course, we explore the role of the ocean in the Earth system, including connections to the atmosphere, geosphere, and biosphere, as well as human and societal interactions. 3 hours of lecture, 2 hours of lab each week. No prerequisites.

Student Learning Objectives:

- Use appropriate earth science vocabulary to describe the creation, evolution, circulation, and properties of the Earth's oceans, including the impacts of tectonic plates, the interaction with the atmosphere, life within the ocean, and connections to the world climate
- Compute the relative impact of natural and anthropogenic forcing on the ocean, both the order of magnitude and the percent change
- Gain confidence and practice in participating actively and respectfully in classroom discussions and presenting one's work to the class
- Critically consider the ocean as described in news reports to determine whether the tone is in line with the content

Assessments

Participation: In all classes, you are expected to actively participate in small groups and with the full class through asking and answering questions and discussing homework and labs. Regular attendance is required for participation. 10% of final grade.

Reading and lab notebook: As you read the text, answer at least 5 review and 3 critical thinking questions in a notebook which will be checked at the start of the next class; add notes for the remaining questions based on class discussion. For labs, write the answers to questions with notes on why that is the correct answer. 20% of final grade, based on completion.

Lab presentation and report: In the class following each lab, one group will present their results in class with an explanation of what in the lab supported each answer. The class will discuss any they were unsure of, and each member of the presenting group will write their own

short report on the conclusions for the next class. 2 presentations and reports from each person, graded A-F, 10% of final grade.

Homeworks: Computation of ocean effects of added heat, pollution, ice melt, etc. 8 total, graded A-F 20% of final grade

Quizzes: 3, focused on the material immediately preceding. Questions are either short answers, requiring the use of new vocabulary and sketches to describe earth system processes, or computational and similar to the homework. Graded A-F, 30% of final grade

Analysis of a news report: Often the news reports on ocean pollution, sea level rise, or sea-ice melting have an alarming tone. Each student will pick one such article and quantitatively analyze it, drawing on course materials and others as needed, writing a short report (2 pages) and giving a short presentation (10 minutes) on the analysis and whether the tone of the article was appropriate. 10% of final grade, equally weighted between presentation and written report.

Schedule (may be updated as needed, which will be announced in class and online)

Week	Lecture 1	Lab	Lecture 2
1		name game, syllabus Introduction to the ocean Lab 1a: Earth's ocean Read Chapters IC and 1	Chapter 1 question review Dr. Brett presents Lab 1a Introduction to unit conversions Start HW 1
2	Introduction to Plate Tectonics How big are the oceans? Read Chapter 2	Chapter 2 question review Lab 2a: Seeing the bottom of the ocean Lab 2b: Ocean bottom bathymetry Assignments of presentations	HW 1 due Discussion of good presentation practices Lab presentations
3	Introduction to Ocean Water Properties How much salt and heat are in the ocean? Read Chapter 3, start HW 2	Chapter 3 question review Lab 3a: Ocean water temperature, salinity, and density Lab 3b: Freshwater, seawater, and sea ice	Lab presentations Introduction to the ocean in the news
4	HW 2 due Introduction to the Atmosphere How big is the atmosphere? Read Chapter 4	Chapter 4 question review Lab 4a: Ocean-atmosphere connections Lab 4b: Solar radiation and sea-surface temperature Complete notebook	Lab presentations Review for quiz Notebook check
5	Quiz 1	Introduction to Ocean Currents Lab 5a: Ocean gyres Lab 5b: Overturning circulation Read Chapter 5, start HW 3	Chapter 5 question review Lab presentations Choose news article

6	News article choice due Introduction to Ocean Waves and Tides Read chapter 6	HW 3 due, news article approvals Chapter 6 question review Lab 6a: Waves Lab 6b: Tides	Lab Presentations How fast are currents, waves, and tides? Start HW 4
7	Introduction to Ocean Life Read Chapter 8	Chapter 8 question review Lab 8a: Upwelling and productivity Group discussion of news articles Read Chapter 9	HW 4 due Chapter 9 question review Lab presentation
8	The eel life cycle and the Gulf Stream Dr. Brett news article presentation Start HW 5	Lab 8b: Chesapeake Bay Lab 9a: Marine ecosystems Lab 9b: Ocean life	Lab presentations Review
9	Quiz 2	HW 5 due, notebook check News article quantification group work Introduction to Climate Variability Read Chapter 10	Chapter 10 question review Introduction to Climate Change Read Chapter 12
10	Chapter 12 question review How fast does climate change? Start HW 6	Lab 10a: Surface currents Lab 10b: El Nino Lab 12a: Earth's changing climate	Lab presentations News article presentations
11	HW 6 due Introduction to coasts and sediments News article presentations Read Chapter 7	Chapter 7 question review Lab 12b: Oceans and climate change Lab 7a: Coastal processes	Lab presentations News article presentations
12	How fast do coasts and sandbars move? Read Chapter 11, Start HW 7	Chapter 11 question review Lab 7b: Impacts of tropical cyclones Lab 11a: What goes down	Holiday
13	HW 7 due News article presentations	Lab 11b: Sediment Review	Quiz 3
14	Introduction to Ocean Exploration How fast can we sample the ocean? Read Chapter 13, Start HW 8	Chapter 13 question review Lab 13a: The seashore Lab 13b: Surface ocean observations Read Chapter 14	Chapter 14 question review Lab presentations Discussion on our responsibility for ocean care
15	HW 8 due Introduction to Ocean and Climate Policy Read Chapter 15	Chapter 15 question review Lab 14a: Fisheries Lab 15a: Oil Spills	News article reports due Notebook check Lab presentations

Policies

Late Assignments: Late assignments without prior approval lose 10% credit per day. Please talk to me in advance if you are having trouble. Talking in person is best, but email is okay.

Missing Class: If you miss class when no assignments are due, please get notes from a classmate. If assignments are due, you must let me know in advance that you are missing class. Illness, car trouble, and family emergencies are understood. If we are doing labs, you may do them from home and show me your notebook during the next class meeting.

Academic Honesty: You are expected to work in groups in many cases. It is your responsibility to be certain you understand all aspects of the assigned work and could do it again on your own. Word-for-word or equation-for-equation copying is never allowed; discuss the process or answer and write it down for yourself. Quizzes are individual activities—do not look at any paper but your own.

Academic Accommodations: Academic accommodations are available for students who are registered with the Office of Accessibility and Educational Opportunity (AEO). If you are registered with that office, please share with me your accommodations letter.