EARTH SCIENCES 1 – OCEANOGRAPHY

FALL 2019

GARY GRIGGS

MON/WED/FRIDAY 10:40-11:45

THIMANN LECTURE HALL 3

COURSE OBJECTIVES

Our lives depend upon the oceans and its important that we know something about the 71% of the Earth's surface that is covered with seawater. Oceanography is designed to provide a broad introduction to the origin and evolution of the Earth and its ocean basins, as well as its physical features and the processes affecting the ocean, its coastlines, and its seafloor. Climate change and sea-level rise, asteroid impacts and global extinctions, El Niño and coastal hazards, marine waste disposal and pollution, ocean acidification and desalination are all topics to be covered.

This course is distinct from but complimentary to Marine Science 1, which has a more marine biological focus. Both courses can be taken for credit in any order. Overlap should be minimal.

CLASS FORMAT AND REQUIREMENTS

Oceanography consists of three weekly lectures. Your grade will be based on three exams, each counting for 1/3 of your grade. The exams are scheduled on the following outline and everyone is expected to be there at the scheduled times, unless there is some unresolvable emergency and I have been informed prior to the exam. The exams will be based primarily on material covered in lectures. I don't give make up exams because you slept in or forgot; failure to take one of the exams will probably result in your not passing the course. There will also be at least one writing assignment, perhaps two but I will give you warning and directions on each in advance.

TEXT: Publishing companies continue to publish new and more expensive editions of introductory Oceanography books every other year. Most of these books are priced from $100 to over $200. I have refused to require these for several years but instead will put several Oceanography textbooks on 2-hour reserve in the Science Library.

INSTRUCTOR

Gary Griggs: Professor of Earth & Planetary Sciences- Office E&MS A-361
[griggs@ucsc.edu]: Office Hours: MWF 9:00 – 10:30 or by appointment

OCEANOGRAPHY LECTURE OUTLINE

Copies of Introductory Oceanography Texts on reserve in Science Library

DATE	TOPIC
Sept 27	Introduction: Perspectives on the Earth and ocean
Sept. 30	History and development of science of Oceanography
Oct 2	Exploring the ocean floor
Oct 4	Origin of earth & oceans;
Oct 7	Continents and Oceans; The structure of the Earth
Oct 9	Continental drift to Global Tectonics-The evolution of a revolution
Oct 11	Global tectonics
Oct 14	The Ocean Floor – Continental shelves, slopes and submarine canyons
Oct 16	The deep-sea floor: mountains ranges, plains, trenches, fracture zones, volcanoes & hotspots
Oct 18	**Midterm No. 1 Bring Pink Scantron – Counts 1/3 of grade**
Oct 21	Seafloor sediments
Oct 23	Paleoceanography-Earth & ocean history from seafloor mud
Oct 25	The water in the ocean; ocean acidification (OA)
Oct 28	Desalination- making salt water fresh; costs, benefits, & impacts
Oct 30	Atmospheric circulation & ocean currents
Nov 1	Tides and tidal power
Nov 4	Tsunamis

Nov 6	Ocean waves: sea, swell and surf
Nov 8	**Midterm No. 2 – Bring Pink Scantron (Counts 1/3 of grade)**
Nov 11	HOLIDAY – Veteran's Day
Nov 13	Waves at the shoreline: Reflection, diffraction, refraction
Nov 15	Beaches and beach sand
Nov 18	Littoral cells/beach compartments, littoral drift, and sand budgets
Nov 20	Coasts
Nov 22	Coastal erosion and responses
Nov 25	El Nino (ENSO) and Pacific Decadal Oscillation (PDO)
Nov 27	Global Climate Change
Nov 29	HOLIDAY – Thanksgiving
Dec 2	Sea-level rise and its impacts
Dec 4	Marine pollution
Dec 6	Energy, petroleum and the sea
Dec. 13	**Final Examination 8:00 -11:00 am- counts 1/3 of grade**