EARTH SCIENCES 1 – OCEANOGRAPHY

FALL 2018

GARY GRIGGS

MON/WED/FRIDAY 9:20-10:25

NATURAL SCIENCE ANNEX 101

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 faunal 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 dominantly 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.

- **Bring pink, full-page Scantron forms for each exam**.

TEXT:

Ocean- The Definitive Visual Guide, American Museum of Natural History ($39.95)

INSTRUCTOR

Gary Griggs: Professor of Earth & Planetary Sciences- Office E&MS A-361
[griggs@ucsc.edu]: Office Hours: MWF 10:30-12:30 or by appointment

OCEANOGRAPHY LECTURE OUTLINE

- *Ocean – The Definitive Visual Guide*
- Copies of Introductory Oceanography Texts on reserve in Science Library

DATE	TOPIC	PAGES IN OCEAN
Sept 28	Introduction: Perspectives on the Earth and ocean	
Oct 1	History and development of science of Oceanography	
Oct 3	Exploring the ocean floor	
Oct 5	Origin of earth & oceans;	
Oct 8	Continents and Oceans; The structure of the Earth	
Oct 10	Continental drift to Global Tectonics-The evolution of a revolution	
Oct 12	Global tectonics	
Oct 15	The Ocean Floor – Continental shelves, slopes and submarine canyons	
Oct 17	The deep-sea floor: mountains ranges, plains, trenches, fracture zones, volcanoes & hotspots	
Oct 19	**Midterm No. 1 Bring Pink Scantron – Counts ¼ of grade**	
Oct 22	Seafloor sediments	
Oct 24	Paleoceanography-Earth & ocean history from seafloor mud	
Oct 26	The water in the ocean; ocean acidification (OA)	
Oct 29	Desalination- making salt water fresh; costs, benefits, & impacts	
Oct 31	Atmospheric circulation & ocean currents	
Nov 2	Tides and tidal power	
Nov 5	Tsunamis	
Nov 7	Ocean waves: sea, swell and surf	

Nov 9	**Midterm No. 2 – Bring Pink Scantron (Counts ¼ of grade)**
Nov 12	HOLIDAY – Veteran's Day
Nov 14	Waves at the shoreline: Reflection, diffraction, refraction
Nov 16	Beaches and beach sand
Nov 19	Littoral cells/beach compartments, littoral drift, and sand budgets
Nov 21	Coasts
Nov 23	HOLIDAY – Thanksgiving
Nov 26	Coastal erosion and responses
Nov 28	El Nino (ENSO) and Pacific Decadal Oscillation (PDO)
Nov 30	Global Climate Change
Dec 3	Sea-level rise and its impacts
Dec 5	Marine pollution
Dec 7	Energy, petroleum and the sea
Dec. 11	**Final Examination 12:00-3:00 pm Bring Pink Scantron**