

## SEMESTER AT SEA COURSE SYLLABUS

Voyage: Spring 2014

Discipline: Environmental Science

EVSC 2050: Introduction to Oceanography

Division: Lower Division

Faculty Name: Gary Griggs

### ***COURSE DESCRIPTION***

Early ocean exploration and the development of the science of oceanography; tools and technology for ocean exploration; the origin and evolution of the Earth and its oceans; continental drift, sea floor spreading and plate tectonics; geomorphology of the seafloor from the continental shelf to the deep sea, including the global distribution and origin of the features such as submarine canyons, ocean ridges and rises, trenches and fracture zones; paleoceanography and the origin, distribution, and historical record of seafloor sediments; climate change and its driving forces; marine mineral and energy resources including the origin and distribution of petroleum and impacts of extraction, transportation, and utilization; salinity and ocean chemistry; the circulation of the oceans; tides and waves; climate change and sea level fluctuations; beaches, shorelines, coastal processes and hazards; pollution and other human impacts on the oceans.

### ***COURSE OBJECTIVES***

To provide an introduction to the importance of oceans in the evolution of Earth and its life, how they affects and what they provide to civilizations today from a global perspective: energy resources, climate and weather, food resources, transportation and defense, water and habitat, and the impacts of humans on the oceans.

### ***REQUIRED TEXTBOOK***

AUTHOR: Trujillo and Thurman

TITLE: Essentials of Oceanography

PUBLISHER: Pearson

ISBN #: 10: 0-321-66812-X

DATE/EDITION: Tenth Edition 2011

### **TOPICAL OUTLINE OF COURSE**

<b>DATE</b>	<b>TOPIC</b>	<b>READING</b>
Jan 13	Introduction: Organization and Scope; Expectations, Required assignments and grading. Early Oceanography	Chap. 1
Jan 15	Exploring the Ocean Floor; Origin of earth & oceans;	Chap. 2 p.75-80
<b><i>Jan 17</i></b>	<b><i>Hilo, Hawaii</i></b>	
Jan 18	Continents and Oceans; Earth structure	Chap. 2
Jan 21	Continental drift to Global tectonics- The evolution of a revolution	Chap. 2

Jan 23	Global tectonics; Coastlines and Tectonics	Chap. 3
Jan 26	Sea floor geomorphology: Submarine canyons; the deep-sea floor: mountains, plains, trenches, fracture zones, volcanoes & hotspots	Chap. 3
Jan 28	Tsunamis: their origin, propagation and impacts	p 253-261
<b>Jan 29- Feb 3 <i>Yokohama and Kobe, Japan</i></b>		
Feb 4	The circulation of the ocean: surface and subsurface	Chap. 7
<b>Feb 6-11 <i>Shanghai and Hong Kong</i></b>		
Feb 13	Pacific Decadal Oscillations; ENSO and El Niño	Chap. 7
<b>Feb 14-19 <i>Ho Chi Minh City, Viet Nam</i></b>		
Feb 21	Upwelling and biological productivity; Hypoxia & dead zones	Chap. 7
<b>Feb 22-23 <i>Singapore</i></b>		
Feb 26	The coastal ocean: estuaries, wetlands & mangroves	Chap. 11
<b>Feb 27-Mar 4 <i>Rangoon, Myanmar</i></b>		
Mar 6	Climate change; Global warming, the greenhouse effect and human impacts	Chap. 16
Mar 8	Sea-level rise: Ancient and modern	Chap. 10/p.515-6
<b>Mar 9-14 <i>Cochin, India</i></b>		
Mar 16	Coasts: landforms and origins; Coral reefs and threats	Chap. 10/16
Mar 19	Waves: storms, sea, swell and surf	Chap. 8
<b>Mar 21 <i>Port Louis, Mauritius</i></b>		
Mar 22	Beaches and beach sand; waves on beaches	Chap. 10
Mar 24	Coastal retreat, erosion and responses	Chap. 10
Mar 27	Sea floor sediments	Chap. 4
<b>Mar 28- Apr 2 <i>Cape Town, South Africa</i></b>		
<b>March 28 <i>Field Trip- Cape Town</i></b>		
Apr 4	Paleoceanography and Earth & ocean history from sea floor	Chap. 4

sediments

Apr 6	The water in the ocean: salinity and desalination; ocean acidification	Chap. 5
Apr 9	Energy: Offshore Oil: origin, distribution, & problems	p. 327-332
<b>Apr 10-14</b>	<b><i>Takoradi &amp; Accra, Ghana</i></b>	
Apr 16	Ocean tides & Ocean energy (wind, waves, tides & currents)	Chap. 9
Apr 18	Marine pollution: sources and impacts	Chap. 11
Apr 21	Marine Pollution and Global Ocean Issues	Chap. 11 & 16
<b>Apr 23-27</b>	<b><i>Casablanca, Morocco</i></b>	
<b>Apr 29</b>	<b>Final Exam</b>	

### ***FIELD WORK***

We will start from Signal Hill for an overview of Cape Town from Dr. John Compton, Associate Professor of Geological Sciences at the University of Cape Town. We will proceed to Sea Point, a site made famous by Charles Darwin's visit in 1836 and its role in the early history of geology, to examine granite and sedimentary rocks exposed along the coast. From there we head south to Hout Bay and drive along the spectacular Chapman's Peak Drive to view sandstone and granite cliffs. We will then go back to the southwestern most tip of Africa, the famed Cape of Good Hope and to Cape Point Lighthouse. Coming back along False Bay coast we will visit Boulder Beach to observe a penguin colony.

### ***ASSIGNMENT***

1. Observe and record (in writing, photographs or sketches) the diversity of the coastal landforms (granitic headlands, long sand beaches, boulder beaches, dunes and estuaries, and offshore islands) around the Western Cape.
2. Document and describe the coastal processes that have shaped this section of the Cape Town coastline and the role that different rock types (granite or sandstone, for example) have played.
3. Describe how coastal rock types have produced different types of beach sands.



*Relief map of Cape Town*



*Sea Point*

### ***METHODS OF EVALUATION / GRADING RUBRIC***

Student grade will be based on 3 quizzes (35%), a paper based on the field assignment (20%), class participation (attendance, engagement in class discussion) (15%) and a final exam (30%).

### **RESERVE LIBRARY LIST**

AUTHOR: Bill Bryson  
TITLE: A Short History of Nearly Everything  
PUBLISHER: Broadway Books  
ISBN #: 0-7679-0817-1  
DATE/EDITION: 2003

AUTHOR: Joshua Slocum  
TITLE: Sailing Alone around the world  
Publisher: Penguin Classics

### ***HONOR CODE***

Semester at Sea students enroll in an academic program administered by the University of Virginia, and thus bind themselves to the University's honor code. The code prohibits all acts of lying, cheating, and stealing. Please consult the Voyager's Handbook for further explanation of what constitutes an honor offense.

Each written assignment for this course must be pledged by the student as follows: "On my honor as a student, I pledge that I have neither given nor received aid on this assignment." The pledge must be signed, or, in the case of an electronic file, signed "[signed]."