

Oceanography@SEA  
Ed Sobey, Ph.D.

## SEMESTER AT SEA COURSE SYLLABUS

Introduction to Oceanography  
EVSC 2050-501 and 502

### COURSE DESCRIPTION

The vast majority of students enrolled in introductory classes in oceanography spend more time buried in textbooks than observing and thinking about the ocean. Semester at Sea provides unique opportunities for students to learn through first-hand observations and experiences as well as the more traditional approaches.

This class will take students through the physical and chemical environments of the ocean to its ecosystems and life processes. It will focus on what students can learn through the unique experience of being both at sea and in port on diverse near-shore environments. Topics included will be geography and geology of the oceans, physical processes (tides, waves, currents, ocean-atmospheric interaction, and world climate), chemical processes, and biological systems (shore environments, coral reefs, polar seas, pelagic, etc.). Environmental issues (oil spills, climate change, over-fishing) will be discussed. The goal will be to engage students in thinking about the processes and dynamics of the seas and to have them learn to satisfy their curiosity thus stimulated.

### COURSE OBJECTIVES

To engage students in learning about the world's oceans through first-hand experiences during the Semester at Sea and for the duration of their lives. Students will hone their observation skills and deductive abilities to understand the oceans and will rely on readings and in-class discussion to refine their understanding.

Students will develop an appreciation for the complexities of ocean dynamics and the importance of oceans in current world issues.

TOPICAL OUTLINE OF COURSE:

<b>Sea Day#</b>	<b>Topic</b>	<b>Reading</b>
1	Assessment of interest and understanding, and evaluation of importance of the world's oceans. Discovery of observational opportunities aboard the ship.	Chapter 1
2	Plate tectonics, hotspots.	Chapter 2
Hilo	(collect sand)	
3	Observations from Hilo. Marine Provinces.	Chapter 3
4	Marine Sediments	Chapter 4
5	Seawater	Chapter 5
6	Air-sea interaction	Chapter 6
Yokohama		
7	Ocean currents and circulation.	Chapter 7
Shanghai		
8	Waves and water dynamics	Chapter 8
9	Tides. Sea oddities.	Chapter 9
Ho Chi Minh		
10	Observations from Vietnam. The coast.	Chapter 10
Singapore		
B10 Penang		
11	The coastal ocean	Chapter 11
12	Marine Life	Chapter 12
Cochin		
13	Review	
14	Mid-term	
15 A before	Productivity	Chapter 13
Port Louis	15 B day after Port Louis	
16	Animals of the pelagic environment	Chapter 14
17	Animals of the benthic environment – Coral reefs	Chapter 15
Cape Town		
18	Fisheries	??
19	Polar worlds. Polar Seas.	??
20	The Oceans and Climate Change.	Chapter 16
Accra		
21	Energy from the sea.	
22	Human's impact on the marine ecosystem.	
23	Reflections on the dynamics of the oceans.	
Casablanca		
24	Final exam	

Text content by chapters: *Essentials of Oceanography*. Trujillo and Thurman. Prentice Hall. 10<sup>th</sup>

edition.

FIELD COMPONENT:

Students will tour local areas of especial oceanic interest and experience the sea in a variety of ways including from inside an ocean kayak, underwater skin diving, and in aquariums.

<b>Port</b>	<b>Activity</b>
Hilo	Hawaii Volcanoes National Park -- Kilauea Visitor Center, Steam Vents, Thurstons Lava Tube, Hike into Kilauea Iki Crater & Jaggar Museum & Halemaumau Crater. Camille Carrasco [edventurebound@gmail.com]
Yokohama	
Kobe	
Shanghai	Optional: Shanghai Ocean Aquarium tour
Hong Kong	
Ho Chi Minh	
Singapore	
Penang	Pulau Payar Marine Park snorkeling coral reefs
Cochin	
Port Louis	Snorkeling trip to Mangroves and coral reefs - Patrick Haberland Yemaya Ltd., Kalodyne (230) 752 0046 Email- <a href="mailto:patrick@yemayaadventures.com">patrick@yemayaadventures.com</a> Web- <a href="http://www.yemayaadventures.com">www.yemayaadventures.com</a>  Or The Mauritius Scuba Diving Association
Cape Town	Whales, penguins, sharks, sea lions; Two Oceans Aquarium Carrin Blake [Carrin.Blake@aquarium.co.za] and Sea kayaking: numerous outfitters, half day.
Accra	
Casablanca	

METHODS OF EVALUATION: Please provide details on grading, including a definition of “class participation” if class participation is to constitute a significant part of the course grade.

To ensure continuous engagement and to launch class discussion, quizzes are given daily. Students research and write short reports based on their own observations (minimum of two reports; maximum of five). These reports will be shared with the shipboard community through poster displays, papers, or other formats.

Observational reports	20%
Field lab	20%
Quizzes	20%
Mid-term exam	20%
Final exam	20%

#### ORDER FORM FOR REQUIRED TEXTBOOKS

*Essentials of Oceanography*. Trujillo and Thurman. Prentice Hall. 10<sup>th</sup> edition.

#### RESERVE LIBRARY LIST

- Chart NO. 1  
Nautical Chart Symbols  
Abbreviations and Terms  
Paradise Cay Publications  
PO Box 29  
Arcata, CA 95518-9063  
www.paracay.com
- *Seabirds: An Identification Guide*  
By Peter Harrison  
Houghton Mifflin Harcourt (September 16, 1991)  
**ISBN-10:** 0395602912  
**ISBN-13:** 978-0395602911
- *Whales, Dolphins, and Other Marine Mammals of the World* (Princeton Field Guides)  
By Hadoram Shirihai and Brett Jarrett (Author)  
Publisher: Princeton University Press (October 2, 2006)  
ISBN-10: 0691127573  
ISBN-13: 978-0691127576
- *How the oceans work*. Mark Denny. Princeton University Press. 2008.

Oceanography@SEA  
Ed Sobey, Ph.D.

5

978-0-691-12647-0

## ELECTRONIC COURSE MATERIALS

In addition to course texts and reserve library materials, each faculty member will have an electronic course folder housed on the ship's intranet. The University of Virginia library will scan articles and chapters identified by the faculty member as needed supplementary materials for the courses they are teaching. These supplementary materials will be placed in the faculty member's intranet folder for students to access from their own computers or from the computer lab.

## ADDITIONAL RESOURCES

Do you anticipate that students will be expected to locate and employ resources beyond required texts, reserve library reading and intranet resources? If yes, please identify these resources.

- Nautical charts of ports: Hong Kong, Cape Town, Penang, Singapore, Hilo, Kobe, Tokyo Bay, Accra, Casablanca, Barcelona, Ho Chi Minh City (and its approaches), Shanghai (and its approaches)
- National Geographic World Climate Map: [www.mapsales.com/products/geonova/world-climate-wall-map.htm](http://www.mapsales.com/products/geonova/world-climate-wall-map.htm)
- National Geographic Ocean Floor Map: [www.mapsales.com/products/geonova/ocean-floor-wall-map.htm](http://www.mapsales.com/products/geonova/ocean-floor-wall-map.htm)
- National Geographic World Physical Ocean Map: [www.mapsales.com/products/ng/world-physical-std\\_t.htm](http://www.mapsales.com/products/ng/world-physical-std_t.htm)
- *The Blue Planet - Seas of Life Collector's Set* (Parts 1-4) (2002) Director: Alastair Fothergill
  
- Poster board to displays – 20 sheets

APPENDIX C: FIELD LAB PROPOSAL FORM

U.Va. Academic Approval  ISE Health & Safety Approval

Faculty Name: Ed Sobey

Voyage: Spring 2013

Course Title: **Introduction to Oceanography** Discipline: Oceanography

I. Field Lab:

Title Volcanoes, the oceans, and climate

Port Hilo

Date January 15, 2013

Destination(s) Hawaii Volcanoes National Park -- Kilauea Visitor Center, Steam Vents, Thurston's Lava Tube, Hike into Kilauea Iki Crater & Jaggar Museum & Halemaumau Crater. If possible, stop along the way for a beach walk/snorkel.

Number of Projected Participants (maximum class size is 35) 35

Duration (hours) of lab 8 hours

II. In-Country Faculty/Contact

Camille Carrasco [edventurebound@gmail.com]

III. Academic Objectives:

1. Understand the size and importance of volcanoes
2. Appreciate how volcanoes work
3. Understand the geology of the Pacific Ocean

IV. Field Lab Description: We will use a commercial tour service to guide us to the Hawaii Volcanoes National Park so we can explore the Lava Tubes, Craters, and visitor center. Along the way we will stop at a beach to talk about coastal processes, beach dynamics, and life at the intersection of land, water, and atmosphere.

V. Associated Assignments: Write short articles on hotspots or the Pacific ring of fire for on-board distribution.

### APPENDIX C: FIELD LAB PROPOSAL FORM

U.Va. Academic Approval  ISE Health & Safety Approval

Faculty Name: Ed Sobey

Voyage: Spring 2013

Course Title: **Introduction to Oceanography** Discipline: Oceanography

#### I. Field Lab:

Title Pulau Payar Marine Park snorkeling coral reefs

Port Penang

Date February 24, 2013

Destination(s) Pulau Payar Marine Park snorkeling coral reefs. Ride boats to the park, snorkel on the reefs.

Number of Projected Participants (maximum class size is 35) 20

Duration (hours) of lab 8 hours

#### II. In-Country Faculty/Contact

<http://www.partner.viator.com/en/1369/tours/Penang/Pulau-Payar-Marine-Park-Snorkeling-Tour-from-Penang/d339-3705PEN27#additional>

#### III. Academic Objectives:

1. Understand the diversity of life on a reef
2. Appreciate the complex interactions on a reef
3. Understand the difficulty of protecting a reef in a third world country

IV. Field Lab Description: We will use a water taxi to get to the park and then rent equipment from the park operator. We will talk about what we see, including the Malaysians lack of concern for maintaining the park.

V. Associated Assignments: Write short articles on coral reefs.



APPENDIX C: FIELD LAB PROPOSAL FORM

U.Va. Academic Approval  ISE Health & Safety Approval

Faculty Name: Ed Sobey

Voyage: Spring 2013

Course Title: **Introduction to Oceanography** Discipline: Oceanography

I. Field Lab:

Title Mangrove Snorkel and Sea Kayak exploration

Port Port Louis

Date March 16, 2013

Destination(s) Mangrove and coral reefs near Port Louis

Number of Projected Participants 12

Duration (hours) of lab 8 hours

II. In-Country Faculty/Contact

Patrick Haberland

Yemaya Ltd., Kalodyne

(230) 752 0046

Email- [patrick@yemayaadventures.com](mailto:patrick@yemayaadventures.com)

Web- [www.yemayaadventures.com](http://www.yemayaadventures.com)

III. Academic Objectives:

1. Understand how mangroves change the marine environment
2. Understand how coral reefs form and provide energy and shelter
3. Understand the importance of these special habitats

IV. Field Lab Description: We will use a commercial tour service to guide us in ocean kayaks to a salt water mangrove and to snorkel in the mangrove and nearby coral reefs.

V. Associated Assignments: Create poster displays describing mangroves or coral reefs to display aboard the MV Explorer.

APPENDIX C: FIELD LAB PROPOSAL FORM

U.Va. Academic Approval  ISE Health & Safety Approval

Faculty Name: Ed Sobey

Voyage: Spring 2013

Course Title: **Introduction to Oceanography** Discipline: Oceanography

I. Field Lab: Two Oceans Aquarium and Sea Kayak exploration

Port Cape Town

Date March 28, 2013

Destination(s) Morning at the Two Oceans Aquarium; Afternoon sea kayaking

Number of Projected Participants (maximum class size is 35) 20

Duration (hours) of lab 8 hours

II. In-Country Faculty/Contact

- Carrin Blake [Carrin.Blake@aquarium.co.za] Two Oceans Aquarium
- Sea Kayak Trips: [tours@kayakcapetown.co.za](mailto:tours@kayakcapetown.co.za)

III. Academic Objectives:

1. Understand the complexity of life in the sea
2. Understand how artificial aquarium mimic natural conditions
3. Understand the dynamic environment of South Africa and how animals adapt to it.

IV. Field Lab Description: Morning tour, including behind the scenes, of the Two Oceans Aquarium, which is adjacent to the port where the ship is tied up. In the afternoon we will use a commercial tour service to guide us in ocean kayaks to observe penguins and whales in their natural habitats.

V. Associated Assignments: Create poster displays describing the marine environment of South Africa to display aboard the MV Explorer.