Voyage: Spring 2015  
Discipline: Environmental Science  
EVSC 2559-101: Geohazards and Natural Disasters  
Division: Lower  
Faculty Name: Dr. Steven Anderson  
Credit Hours: 3; Contact Hours: 38

Pre-requisites: None

COURSE DESCRIPTION

This course focuses on understanding the processes creating and triggering natural phenomena that we perceive as hazardous or disastrous. We will consider the science that governs these phenomena using case studies from the countries that we will visit. Topics include plate tectonics, earthquakes, volcanic eruptions, floods, coastal erosion, tropical storms and wildfires.

COURSE OBJECTIVES

The goal of this course is to provide the scientific background needed to understand the processes that create natural hazards, and the complex issues associated with hazardous Earth processes affect human populations. We will pay special attention to the hazards present in the countries that we will visit. This goal will be met by concentrating on the following objectives:

1. Understand the basic physical, chemical and geologic processes that create natural hazards.
2. Understand the complex relationships between hazards and growing human populations, with special attention paid to the impact of hazards in coastal areas.
3. Understand the complex interplay between hazards, politics, law, and international relationships.
4. Understand the role of climate change on natural disasters, with special attention paid to the impacts on coastal regions.

REQUIRED TEXTBOOKS

AUTHOR: Abbott  
TITLE: Natural Disasters, 10th ed  
PUBLISHER: McGraw-Hill  
ISBN #: 9780077839338  
DATE/EDITION: 10th, 2014
TOPICAL OUTLINE OF COURSE

Depart Ensenada- January 7:

B1-January 10: Course Introduction – Earth’s Geography and Human Population I – Read Chapter 1 of Abbot

Homework I – View 4 part VolcanoLive special – Write 2 page paper on pros and cons of living intimately with natural hazards. Will show first two tonight at 9pm, next two tomorrow at 9, then on loop.

B2-January 12: Volcanism I – Kilauea Volcano History – Read Chapters 6 and 7

Hilo: January 14 – Field Lab at Kilauea Volcano

B3-January 15: Trip Debrief! What is a “Natural Hazard”? - Scale of Hazards

B4-January 17: The Structure of the Earth – Geosphere and Hydrosphere I – Read Chapter 2

Study Day: January 20

B5-January 21: The Structure of the Earth –Atmosphere and Magnetosphere II (Paper 1 Due)

B6-January 23: Internal Earth Forces and Plate Tectonics I – Read Chapters 3-5

B7-January 25: Earthquakes and Tsunamis I – The 2011 Earthquake and Tsunami of Japan

Yokohama: January 26-27
In-Transit: January 28
Kobe: January 29-31

B8-February 2: Internal Earth Forces and Plate Tectonics II – Major Earthquakes in China and Impacts on Populations and Economy

Shanghai: February 3-4
In-Transit: February 5-6
Hong Kong: 7-8

B9-February 10: Weather and Climate I – Effects of Recent Major Storms on Vietnam–Read Chapters 10-12

Ho Chi Minh: February 11-16

B10-February 18: Earthquakes and Tsunamis II
Singapore: February 19-20

Study Day: February 21

B11-February 23: Weather and Climate II – The Effect of Climate Change on Natural Hazards in Myanmar

Rangoon: February 24-March 1

B12-March 3: Volcanic Eruptions II – Continental Flood Volcanism in India

B13- March 5: Exam 1

Cochin: March 6-11

B14-March 13: Review of Exam 1

Study Day: March 14

B15-March 16: Floods I – The 2013 Flooding in Port Louis – Read Chapter 13

Port Louis: March 18

B16- March 19: Floods II

Study Day: March 21

B17-March 22: Fires I – Paper 2 – 2 page paper on impact of a hazard in one of the countries we visit

B18- March 24: Extraterrestrial Hazards I – Vredefort Impact Basin South Africa – Read Chapters 16-17

Cape Town: March 25-30

B19-April 1: Geologic Hazards of Namibia

Walvis Bay: April 2 - 6

B20-April 8: Hurricanes and Typhoons

B21-April 10: Landslides and Earth Movements – Read Chapter 15

Study Day: April 11
B22- April 13: Human-caused Hazards (Paper 2 Due)

B23: April 15: The Future of Natural Hazards and Effects on Populations

Study Day: April 16

B24: April 18: Review

Casablanca: April 19-23

April 24: Global Lens Exams and Study Day

B25 – April 26: B Day Finals

April 29: Arrive in Southampton
FIELD WORK
Field lab attendance is mandatory for all students enrolled in this course. Please do not book individual travel plans or a Semester at Sea sponsored trip on the day of your field lab.

FIELD LAB (At least 20 percent of the contact hours for each course, to be led by the instructor.)

We are planning a site visit to the Kilauea volcano, the most active volcano on Earth. If possible, we will hike across recent devastation caused by a 30-year continuous eruption to witness active basaltic lava flows. We will look first hand at how this eruption has impacted local populations, and discuss other hazards related to the eruption of oceanic volcanoes. We will also hear from volcanologists with the Hawaiian Volcanoes Observatory and how they work to mitigate the hazards associated with eruptions. If active lava flows are not available, we will travel to the summit of Kilauea volcano and visit the Hawaiian Volcano Observatory. We will then hike through Kilauea Iki Crater where we will look at the products produced during an impressive eruption in 1959.

Dress Code: Men and Women: Expect cool, rainy conditions with temperatures in the 50’s and 60’s for parts of the hike (it’s a rainforest!), but be prepared for times of hotter temperatures (70’s) when the sun makes an appearance. Sturdy footwear (hiking boots STRONGLY suggested) approved by professor. Shorts are permitted but long pants suggested (the Kilauea Iki and the Kilauea caldera are both at 4000’, and temperatures are typically quite cool). Zip off hiking pants afford the most versatility. Layers are suggested for upper body – a short sleeve shirt covered by a long sleeve shirt (for warmth and sun protection) covered by a rain jacket (it rains nearly every day at Kilauea Iki). Hats are also suggested for UV protection (easy to get burned at this elevation even with cloud cover). Students may prefer to bring an extra shirt (especially short sleeve), socks and pants to change into after the hike for dinner and night time crater viewing. Expect temperatures in the 50’s when we meet with the USGS and for the night time crater viewing.

FIELD ASSIGNMENTS

- Students will be required to attend the Hawaii field lab. Absence from the lab will result in a 20% loss of the course grade.
- Each student will prepare a paper or blog (equivalent of 3 pages, double-spaced) dealing solely with their reflections of the field lab experience.
- The Hawaii field lab assignment will count towards 20% of the student’s overall grade (see below).

METHODS OF EVALUATION / GRADING RUBRIC
20% - Field Lab and Field Lab Writeup  
(10% attendance and 10% quality of paper or blog piece) 
30% - Exam 1  
30% - Final Exam  
10% - Paper 1  
10% - Paper 2  

ATTENDANCE POLICY  

Although I will not take attendance at the beginning of every class, your performance in this course will depend strongly on your attendance as I will emphasize material we focus on during class periods. Therefore, attendance is mandatory and I will occasionally spot check attendance by taking roll. Students missing class will be penalized 3% of the 100% total for the semester for each class missed where I take attendance. This may be enough to drop your final grade, especially if I decide to take attendance frequently. If you must miss class for any reason, you are expected to contact the instructor prior to class and arrangements will be made to catch up on the material missed.  

RESERVE LIBRARY LIST  

At present, there are no additional reading materials required. However, if course discussions dictate the need for additional materials, the instructor will place any supplementary reading materials on reserve.  

ELECTRONIC COURSE MATERIALS  

Electronic course materials will be made available as needed.  

ADDITIONAL RESOURCES  

At present, there are no additional resources required. However, if course discussions dictate the need for additional materials, the instructor will make available any additional resources.  

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].”