

SEMESTER AT SEA COURSE SYLLABUS
University of Virginia, Academic Sponsor

Voyage: Spring 2016

Discipline: Environmental Science

Course Title: EVSC 3559-101: Geologic Hazards

Division: Upper

Faculty Name: John Tyner, Ph.D., P.E., P.G.

Credit Hours: 3; Contact Hours: 38

Pre-requisites:

COURSE DESCRIPTION

Geologic hazards have been present throughout geologic time and will persist until the Earth's demise billions of years in the future. In this course, you will learn about the drivers of geologic hazards and the risks they pose to humans and the environment. Topics include: Plate tectonics, earthquakes, volcanism, asteroid impacts, tsunamis, landslides, coastal erosion, inundation, land subsidence, sink holes, flooding, hurricanes, climate change, and their impacts. Some geologic hazards can be actively managed, others can be avoided geographically by the wealthy, and others are largely uncontrollable, but a quantitative understanding of the hazards is a first step towards making rational decisions to mitigate the risks.

COURSE OBJECTIVES

To provide a clear, understandable and comprehensive description of the causal factors and global distribution of the most common geologic hazards as well as their impacts on the lives of people and the environment.

REQUIRED TEXTBOOKS

AUTHOR: Donald and David Hyndman

TITLE: Natural Hazards and Disasters

PUBLISHER: Brooks/Cole

ISBN-10: 1133590810; ISBN-13: 978-1133590811

DATE/EDITION: 4th edition, 2013

TOPICAL OUTLINE OF COURSE

Note: The textbook chapters have been assigned in an order that aligns with our itinerary, so that the various subjects may be understood partly in relation to our experiences at the ports. When you visit various ports, please pay particular attention to color coded lecture material and readings that correspond to the same color coded port. You may expect the pre-and/or post lectures following ports visits to discuss what you might/did experience while visiting the ports in relation to the class material.

Depart Ensenada- January 5:

B1- January 8: Course introductions and syllabus: an overview of geologic hazards (ungraded in-class writing assignment) (Chapter 1)

B2- January 10: [Volcanoes: tectonic environments and eruptions \(Chapter 6\)](#)

B3- January 13: [Volcanoes: hazards and mitigation \(Chapter 7, In the Path of a Killer Volcano\)](#)

Honolulu: January 12

B4- January 15: [Plate tectonics and physical hazards \(Chapter 2\)](#)

B5- January 18: [Earthquakes and their causes \(Chapter 3, Quiz 1\)](#)

Study Day: January 19

B6- January 21: [Earthquake prediction forecasts and mitigation \(Chapter 4, Kobe Earthquake Disaster\)](#)

B7- January 23: [Tsunami I \(Chapter 5\)](#)

Yokohama: January 24-25

In-Transit: January 26

Kobe: January 27-28

B8- January 30: [Tsunami II, Cases in Point \(Chapter 5, Fukushima Nuclear Disaster\)](#)

Shanghai: January 31-February 1

In-Transit: February 2-3

Hong Kong: 4-5

B9- February 7: [Erosion I. Turn in Journals for check #1 \(Chapter 8\)](#)

Ho Chi Minh: February 8-12

B10- February 14: [Erosion II \(Chapter 8\)](#)

Study Day: February 15

B11-February 17: [Landslides \(Chapter 8, Quiz 2\)](#)

Yangon: February 18-22

B12- February 24: [Extreme weather \(Chapter 10\)](#)

B13- February 26: Exam 1

Cochin: February 27-March 3

B14- March 5: Land subsidence (Chapter 9)

Study Day: March 6

B15- March 8: Sinkholes (Chapter 9)

Port Louis: March 9

B16- March 11: Coastal erosion (Chapter 14)

Study Day: March 12

B17- March 14: Wildfires (Chapter 16)

Cape Town: March 15-20

B18- March 22: Extraterrestrial impacts (Chapter 17, The Day the Mesozoic Died)

B19- March 24: Streams and Flooding (Chapter 12, Quiz 3)

B20- March 25: Flooding II (Chapter 13)

Takoradi: March 27-28

Tema: March 29-31

B21- April 2: Climate Change (Chapter 11)

B22- April 4: Hurricanes and Typhoons (Chapter 15)

B23- April 6: Hazard assessment and mitigation II (Chapter 18)

Casablanca: April 7-11

Study Day: April 12

B24- B Day Finals, April 14: Final

April 16: Disembarkation Day

FIELD WORK

Experiential course work on Semester at Sea is comprised of the required field lab led by your instructor and additional field assignments that span multiple ports.

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

Field lab attendance is mandatory for all students enrolled in this course. Do not book individual travel plans or a Semester at Sea sponsored trip on the day of your field lab.

The field lab for this course takes place on: Jan 27

We are planning a site visit in and around Kobe, Japan to see first-hand the damage that can result from a large earthquake applied to an urban infrastructure. This will begin with a visit to the Disaster Reduction and Human Renovation Institution, a participatory museum devoted to the Great Hanshin earthquake that struck Kobe on the morning of 17 Jan. 1995. As we travel through the city and its parks dedicated to remembering the 1995 earthquake, we will see the toll it laid upon the city and its people. Generally the newest buildings that were built under the strictest earthquake based codes fared quite well, and among the older structures many were reduced to rubble. Of course the cost of constructing earthquake-resistant buildings is not insignificant. How widely and how strict should earthquake codes be throughout the world geographically and economically?

FIELD ASSIGNMENTS (Kobe Field Lab)

- Students will be required to attend the Kobe field lab. Absence from the lab will result in a 20% loss of the course grade.
- Each student will prepare a minimum 3-page double spaced paper describing their reflections of the field lab experience.

THE JOURNALS

Each student will create a journal that includes their in-class notes and daily personal entries. This journal will be graded at various times during the semester, and will constitute 20% of your course grade. This journal will become your own personalized textbook of experiences and thoughts that originate both inside and outside of the classroom. Basically, you will build this journal during our class periods, our field trip, from out-of-class discussions with classmates and perhaps professors, and after some personal reflection of what you learn each day. Your journal will contain written notes, and perhaps written daily entries, although you may elect to put some or all of the daily entries into electronic format as a blog. You may structure your notebook anyway you desire, but you must at least include:

- 1) Class notes/drawings from each class period.
- 2) An additional entry from every day reflecting on what was learned in class, what you learned from assigned readings, and how this information relates to you personally. On those days when we do not have class, you will spend some time thinking about the lessons learned in previous classes, and how that information relates to things that interest

you. This is essentially the "diary" portion of the notebook where I want you to step back and assess the importance of what you have learned each day. This section will be your own personal account of the value of this portion of the class. You will want to consider new things that you learn each day, and whether or not you believe that these lessons will be of value to you in the future. I want you to be honest with your reflections. Your grade for this task will be based on how clearly and thoroughly you convey your thoughts, and not on whether I agree with your assessment. Feel free to be creative, and run with your thoughts. Create a record of your thinking.

In addition, you may include:

- 1) Diagrams and accompanying explanations of things you see during our port stops. You may want to bring colored pencils with you as you travel around to aid you with this task. If you wish, you can also photo-document various aspects of energy use or consumption that you see.
- 2) Anything else you want to include. I do not want to place boundaries on where you take this exercise. Each student brings a different set of background experiences to this class that will affect their learning. Be as creative as you wish!

There are several goals that accompany creating and keeping a class journal. First, it will require that you constantly think and reflect upon what you learn, and what you see and experience. I've found that this enriches our classroom discussions, and enables us to delve deeper into this subject. It also requires you to write each day, and I want each of you to practice clear, concise writing. Finally, it is a record of what you learned and what you thought about over a semester that may be transformative for you, and you may find it enlightening and useful later in life to page through this journal.

NOTE: I want you to start your journal by writing your first reflection piece at the end of our first lecture. This first entry should focus on what your goals are for this course, and what you anticipate learning during this semester. I think you will find it interesting after the course is finished to compare your goals at the outset of the course with your final reflection piece where you summarize what you learned during the semester.

METHODS OF EVALUATION / GRADING RUBRIC

- 20% - Field Lab and Field Lab Journal Entry
- 20% - Two journal checks at 10% each
- 20% - Midterm
- 25% - Final Exam (cumulative)
- 15% - Quizzes (each of three quizzes is 5% and will be based upon the reading and/or video assignments)

Please note attendance and participation is required on Semester at Sea. Absences are only excused when accompanied by a note from the clinic.

RESERVE BOOKS AND FILMS FOR THE LIBRARY

The Day the Mesozoic Died
In the Path of a Killer Volcano
Kobe Earthquake Disaster
Fukushima Nuclear Disaster

ELECTRONIC COURSE MATERIALS

Electronic course materials will be made available as needed.

ADDITIONAL RESOURCES

Additional resources will be made available as needed.

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]."