

Volcanoes and Earthquakes

G 457U CRN 61252 (4 cr) Spring 2010

Location: Class meets in CH 325 from 7:45 to 8:50 am MWF

Instructor: Melinda Hutson, CH 17,
e-mail: mhutson@pdx.edu.

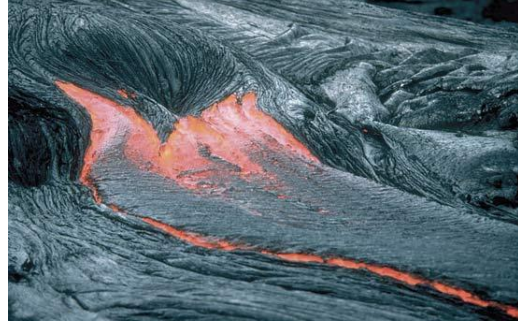
Class web site: web.pdx.edu/~mhutson/457

Office hours: 9-10am F. Please contact me via e-mail if you need to make an appointment to see me outside of my regular office hours.

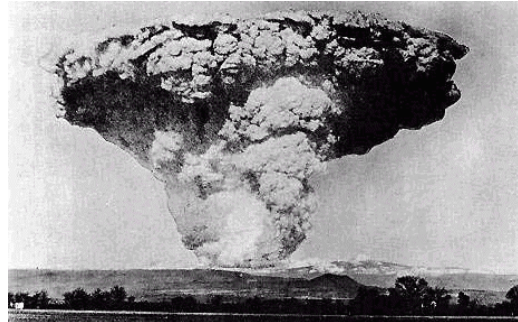
Course Description: A study of volcanoes and earthquakes as they affect humans and the development of landscapes. A field trip is required. Prerequisite: an introductory science course.

Textbooks: There is no textbook for this course – from time to time, I may put a supplemental reading on the web site, depending on the needs of the class.

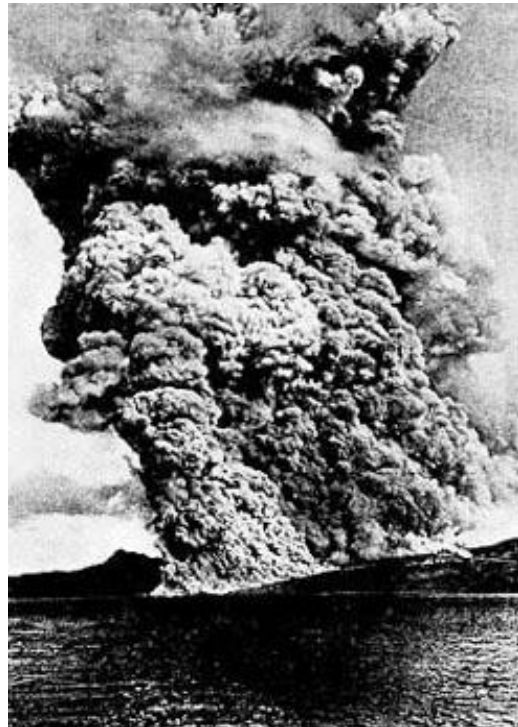
Course Goals: By the end of this course, students will understand that both volcanoes and earthquakes are manifestations of the cooling of our planet's interior. Students will understand why the interior of the Earth is hot, and what mechanisms the planet uses to cool down. Students will also become familiar with the theory of plate tectonics and realize that most, but not all, volcanic and earthquake activity occurs at the boundaries between the Earth's plates. Students will discover that there are multiple kinds of volcanic eruptions and different types of earthquake motions, and will be able to distinguish between those that are more or less hazardous. Students will be able to



Eruption of pahoehoe (basaltic) lava from Kilauea volcano in Hawaii. Date unknown.



Explosive eruption of Mt. Lassen in northern California in May 1915. Mt. Lassen is part of the Cascade range of volcanoes, which includes Mt. Hood and Mt. St. Helens.



Pyroclastic eruption on the island of Martinique in August 1902, with material expanding a distance out to sea.

recognize a variety of volcanic landscapes and features, as well as some earthquake features, and be able to assess the relative hazards indicated by these features. Students will explore case studies involving human tragedies resulting from volcanic eruptions and earthquakes.

Class schedule: The tentative schedule follows. Changes will be posted on the class web site under “Announcements”.

Week #	Topic
1	Introduction: what is a volcano, what is an earthquake, how are they related, Earth’s interior
2	Origin of the Earth, Plate tectonics, ophiolites, hot spots and mantle plumes
3	Minerals, Rocks, and magma generation
4	<u>Monday: First Exam</u> Lava flows, including submarine eruptions, pillow structures, columnar joints, types of flows, features of flows – include necks, sills, and dikes, as “feeders” and remnants of an eroded volcano
5	Explosive volcanism, pyroclastic eruptions, pyroclastic flows, calderas
6	Lahars, lateral blasts, avalanches, tsunamis – other ways a volcano can kill – case study Armero.
7	Eruptions and climate, and volcano monitoring
8	<u>Monday: Second Exam</u> Wednesday and Friday: Back to earthquakes – how big was that quake? Recent examples
9	Earthquake prediction and seismic hazard assessment; discussion of the Cascadia subduction zone and the New Madrid fault zone FIELD PROJECT DUE ON FRIDAY MAY 28
10	<u>Monday May 31 – no class – Memorial Day</u> Discussion of famous historic earthquakes and wrap-up of course
Finals	<u>Final Exam:</u> Monday JUNE 7 8:00-9:50am

CLASS POLICIES:

Attendance: I will not be checking attendance. However, there may be announcements or material covered in lecture that cannot be easily obtained without attending class. The lectures and the assigned readings are meant to be complementary. There may be material covered in lecture that is not in the textbooks. Conversely, not all of the material in the textbooks will be discussed in lecture. Any of this material may be on an exam.

Course web site: A course web site will contain a copy of the syllabus, specific information about assignments, specific information and requirements about the field project, announcements about changes to the course, and study guides for the exams. That address is <http://web.pdx.edu/~mhutson/457>

E-mail Policy: Because I get a huge volume of unwanted e-mails, I delete many without opening them. If you want to reach me by e-mail, please indicate G457U in the subject line of your message. Also, **I do NOT open attachments**. There are two reasons for this: 1) I've picked up unwanted worms/viruses that way, and 2) I can't always open the attachments. If you need to turn in an assignment via e-mail, copy and paste it into the body of the e-mail.

Discussions/short papers: There are three types of discussions/short papers that may occur during this class. You may be asked at the start of class to summarize key points from the previous class. We may stop in the middle of a lecture to have a group exercise or discussion. I may ask you at the end of class to reflect on key points covered during the lecture. Many of these will be group exercises. All of these will be handed in and graded as "excellent", "average", "below average".

Field Project: This course requires that students get out into the real world and look at what surrounds them (in a geological/volcanic/earthquake sense). Details about the field project will be posted on the class web site and discussed in class. As with assignments, field projects **MUST BE TYPED**. Field projects are due at the start of class on the Friday of week 9 of the term. Late projects can be turned in any time before the final, but will lose 20% of their total credit. To avoid problems, I strongly suggest that you turn the field project in EARLY.

Exams: There are two exams during the term and a final exam. All three exams will be comparable in length, and the final will be weighted the same as the other two exams. I will drop the lowest of the three exam scores (you will be graded on your two best exams). Consequently...

NO MAKE-UP EXAMS WILL BE GIVEN FOR ANY REASON.

Academic Integrity: It is expected that work submitted by students represents that done by the students themselves. Work copied from others in the class will result in zeroes for the assignment involved. Students should also avoid plagiarism. Plagiarism is presenting someone else's work as your own, even accidentally. Students can avoid plagiarism by making sure that they acknowledge words or ideas that come from other sources—such as direct quotes (and you should limit your use of these), paraphrases, statistics or illustrations. All of these must be properly referenced.

Accommodations: If you have a disability and need an accommodation, please make arrangements to meet with me outside of class. PSU students requesting accommodations must provide documentation of disability and work with the Disability Services for Students (DSS) office (503-725-4150).

Grades: Grading is based on a percentage out of 100% of the possible course total: 93-100=A, 90-92.99=A-, 87-89.99=B+, 83-86.99=B, 80-82.99=B-, 77-79.99=C+, 73-76.99=C, 70-72.99=C-, 67-69.99=D+, 63-69.99=D, 60-62.99=D-, below 60=F.

Grades will be determined from performances on:

Best two exams (20% for each exam)	40%
Discussions/short papers	30%
Field project	30%

I generally do not give incompletes.