

Earth Science 150: The Catastrophic Earth

Spring 2008

Course Information

Lecture: Tuesdays and Thursdays 11:00 am – 12:15 pm, MSEC 103

Instructor: Susan Bilek

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Office Hours: Mondays 2-3 pm, Fridays 10 am – 12 pm

Course Objectives

This course will provide an introduction to forces that drive natural hazards such as earthquakes, volcanoes, floods, and severe weather. We will discuss recent and historical events as well as local hazards where appropriate. Students will be able to describe forces behind significant hazards, identify areas of the world where particular hazards are likely, and compile information to assess magnitude and effects of natural hazards.

Course Materials

Required Text: *Natural Hazards 2nd Edition*, authors: Keller and Blodgett, publisher: Prentice Hall, 2008. This is available at the NMT bookstore.

Class Website: www.ees.nmt.edu/Geop/Classes/Geop150/homepage.html

Announcements, class schedule, and useful links will be posted on the class website throughout the semester.

Grading Policy

Midterm Exam:	25%
Final Exam:	35%
Film Reviews:	15%
In-class Assignments:	15%
Disaster Log:	10%

Exams

This course will have 1 midterm on March 6th and a final exam (date TBA in class and on the website). The questions will come from lectures and reading material. **The final exam will be cumulative.**

Film Reviews

One aspect we will touch on in this course is how science is communicated to the public, as this has significant implications for policy makers and for the average person to understand risk. Science is reported in the newspapers, TV news, and internet sites, but science also makes into the movies. For this class, we will look at science in popular disaster-related movies.

You will be required to view 3 disaster-related movies outside of class from a set of 9 that I have chosen. The Earth Science Club here at NMT has agreed to hold viewings of these movies on campus on Wednesday evenings (see schedule below). These viewings will start at 5:15 or 5:30 pm, after their weekly ESC meetings (which you are all welcome to attend).

After the viewing, you will write a 2 page review of the movie, with strict focus on 2 things: 1) what are the big science fallacies or problems in the movie? 2) within the movie, how does scientific information get transmitted to the public or policy-makers, and was it an effective way to communicate important scientific information? These reviews will be due in the next Tuesday class period after the viewing. No late reviews will be accepted, because we will discuss some of these issues in class on the due date.

In-class Assignments

Throughout the semester, we will have several in-class exercises where you will work in groups to solve a problem related to the lecture material. These will be unannounced, so please make every effort to attend class regularly. There will be no make ups for these in-class exercises.

Disaster Log

The final component of your grade will be based on a disaster log. You will be required to compile information on major natural disasters (meaning ones that you hear about via common media outlets and that have an impact on society) that occur during the semester. Good sources for information are newspapers, magazines, and the internet. The log should list major natural disasters that occur during the course along with details on the effects (such as death/injury toll and economic impact), and your source for information. Your log (which should be typewritten and turned in on the last day of class) will be compared with a log compiled by the instructor. An example will be posted on the class website.

Late policy

Late film reviews will not be accepted because we will discuss them in class. There will be 9 possible movies to choose from, and you will only need to write reviews of 3. Late disaster logs will be assessed a 10% per day penalty.

Academic Honesty

Although there will be some exercises in class where you will discuss problems in groups, I expect that you do your own work on exams, film reviews, and the disaster log compilation. You may discuss topics with other students, but you must write up your own work, in your own words. When compiling disaster information from sources for your log, do not copy directly from the source, but paraphrase (put information in your own words). Please see the library's website for more discussion of this issue (<http://infohost.nmt.edu/~nmtlib/INFO/OREf/plagiarism.html>) or see me with questions. Problems with cheating or plagiarism will lead to a failing grade in the course.

Schedule of Topics

Date	Topic	Readings
1/22	Class Introduction	
1/24	Earth Forces and Hazards	Ch. 1
1/29	Plate Tectonics Science Communication – Dr. Walsh	
1/31	Rocks and Minerals	
2/5	Plate Tectonics	Ch. 1.3
2/7	Earthquakes – Basic Principles	Ch. 2.1-2.5
2/12	Earthquake Hazards	Ch. 2.6-2.8
2/14	Earthquake Prediction	Ch. 2.9-2.10
2/19	Earthquake Case Studies	
2/21	Tsunami	Ch. 3
2/26	Volcanoes – Eruptions & Products	Ch. 4.1-4.2
2/28	Volcanic Hazards	Ch. 4.3-4.6
3/4	Volcano Case Studies & Hazard Mitigation	Ch. 4.7-4.8
3/6	Midterm Exam	
3/11	SPRING BREAK	
3/13	SPRING BREAK	
3/18	Mass Movement Processes	Ch. 6.1-6.2
3/20	Mass Movement Processes and Hazards	Ch. 6.3-6.7
3/25	Subsidence Hazards	Ch. 7
3/27	Principles of Weather	Ch. 8.1-8.4
4/1	Cyclones and Thunderstorms	Ch. 8.5-8.8
4/3	Tornados	Ch. 8.5-8.8
4/8	Principles of Hurricanes	Ch. 9
4/10	Hurricane Case Studies	
4/15	Coastal Processes	Ch. 10
4/17	Stream Processes	Ch. 5.1
4/22	Flood Hazards	Ch. 5.2-5.6
4/24	Flood Mitigation and examples	Ch. 5.7-5.9
4/29	Climate and Climate Change	Ch. 11
5/1	Climate and Climate Change	Ch. 11
5/6	Meteorites & Impact Hazards	Ch. 13
5/8	Fire Hazards and Mitigation	Ch. 12

Film Viewing Schedule

Date	Movie	Location
2/6 (W)	The Core	MSEC 101
2/13 (W)	10.5	MSEC 101
2/20 (W)	Tidal Wave: No Escape	MSEC 101
2/27 (W)	Volcano	MSEC 101
3/26 (W)	Lightning: Bolts of Destruction	MSEC 101
4/9 (W)	Twister	MSEC 101
4/23 (W)	Flood	MSEC 101
4/30 (W)	The Day After Tomorrow	MSEC 101
5/7 (W)	Deep Impact	MSEC 101