Living with Earthquakes and Volcanoes
Geology and Geophysics 3030, Summer 2015
Course Syllabus

Instructor: Dr. Michael G. Davis
Email: michael.g.davis@utah.edu
Phone: 801-587-8846
Office: FASB 227
Office Hours: By appointment (please feel free to contact me).

Overview:
This course, Living with Earthquakes and Volcanoes, explores two of Earth’s most spectacular phenomena from a variety of perspectives: physical sciences (basic and applied), social sciences, and engineering. To understand where and why earthquakes and volcanic eruptions occur, we use the geological concepts of plate tectonics, deep time, and the persistence of processes and principles. Earthquakes and volcanic eruptions are a global concern, requiring collaborative international prediction programs and remediation responses; this course is intended to increase individual awareness of these international implications and attendant responsibilities. The global patterns of earthquakes and volcanic eruptions place particular burdens on a few countries (e.g., Japan, Indonesia, China), and hence we will investigate how these events influence the lives of people and cultures around them. However, despite the different influences of earthquakes and volcanoes on different cultures, many countries need to find their own answers to the same question: How do local constraints (culture, infrastructure, government, economics) affect the feasibility of applying scientific and engineering solutions to hazard reduction?

The course will emphasize the contributions to the earth sciences of many different disciplines and the integrated nature of modern scientific endeavor. The value of science as a thread in the larger human discourse will also be emphasized. Students will be expected to make and record scientific observations, make interpretations of these observations, and share and debate the relative merits of different interpretations of the available data. Geo3030 is a Science Foundation course and satisfies the International Requirement.

Textbook:
The primary readings for this course are the online course web pages. The course does not use paper-based texts. The text was originally created by Dr. Richard Jarrard ("Living with Earthquakes" and "Living with Volcanoes") and has been updated by others, including Dr. Erich U. Petersen and myself.

[Optional Textbook Note: If you are very interested in these topics, I would highly recommend the following two books: Earthquakes by Bruce Bolt (ISBN: 0-7167-7548-4) and Volcanoes by Decker and Decker (ISBN: 0-7167-8929-9). These are both very excellent textbooks, but they are NOT required for this class.]
Course structure:
This intensive course consists of 5 sections that are each divided into 3 or 4 modules. A typical module includes a chapter or two from the reading, a short online quiz, an in-class lecture and an assignment. It is expected that the reading and quiz for each module will be completed PRIOR to class, so that each class is a combination of lecture with student discussions, interactions, and hands-on projects. The sections and modules are (subject to change):

Section 1: Science and Geology (Monday)
Introduction and Overview
A Multiple Perspectives Approach to Earthquakes and Volcanoes
Minerals, Rocks, and Deep Time
Dynamic Earth: Plate Tectonics

Section 2: Plate Tectonics and Volcanoes (Tuesday)
Dynamic Earth: Plate Tectonics
Volcanism: Kinds of Eruptions
Volcanoes: Where and Why?

Section 3: Volcanoes II – Hazards and Prediction (Wednesday)
Volcanoes and People: Volcanic Hazards
Living with Volcanoes
Volcano Prediction

Section 4: Earthquakes – The Physical Basics and Plate Tectonics (Thursday)
Stress, Strain, and Seismic Waves
Earthquakes: Where and Why?
Earthquakes and People: Earthquake Hazards

Section 5: Earthquakes II – Hazards and Prediction (Friday)
Living with Earthquakes: Some Examples
Earthquake Prediction: 3 Countries, 3 Approaches
Tsunami: Multinational Impact and Response
Summary/Review

Reading:
Due to the intensive nature of this course, the majority of the reading will be completed PRIOR to attending class. As stated previously, each module contains one to two chapters of online reading material that will be available via Canvas. Make sure to check Canvas for the reading materials and assignments.

Quizzes:
Almost every module has an associated quiz. Online quizzes are short (5-12 multiple-choice questions) and brief (20 minute maximum). I recommend that you take each quiz right after you have completed the module reading. Online quizzes are open-book and open-note, as the quizzes have two purposes: to encourage you to keep up on your
module readings, and to familiarize you with the kinds of questions that you are likely to encounter on the exam. Please be aware that quizzes may have due dates PRIOR to the first day of class.

Other quizzes will take place in-class. In-class quizzes will be short, but unlike online quizzes, will be closed-book and closed-note. Overall, quizzes are worth 20% of your final grade. There are no "make-up" quizzes.

**Assignments:**
Assignments are the core of this course, and they are 50% of the total course grade. Assignments include student and group discussions, as well as hands-on projects. Many, if not most, of the assignments will be completed during class time, and will involve the application and interpretation of scientific data. Science is rarely done alone, and so work will often be completed in groups. However, assignments must be submitted individually, and not as a team. Feel free to work together, but make sure everyone contributes. It will be painfully obvious if you only copied someone's assignment. Copied assignments, and the one from which they were copied, will receive zero credit. Due dates for assignments will generally be the same or next day after the assignment is given. Late assignments will be accepted, but at a reduced score of 50% off per day.

**Final Exam:**
The Final Exam is worth 30% of the total course grade. The exam is given entirely on Canvas and is composed primarily of “short answer” questions. The final exam may be taken on any day following the conclusion of the in-class portion of the course until Saturday, May 30 at 11:59 pm. The Final exam is comprehensive, and will have a very stringent ‘time window’ (the same as the quizzes, only longer: 120 minutes for the final) so be sure you have scheduled distraction/disruption free time for yourself to take the exam. I STRONGLY recommend that you do not wait to the last minute to take your exam, primarily for you to avoid technical or other difficulties.

The exam is closed-book; no notes, recorders, headphones, calculators, talking, looking at a neighbor's answers, or getting someone else to do the problems for you. No cheating! I have secret ways of catching cheaters (for example, it is painfully obvious if you have “googled” your answer; also, you will run out of time), and I am not charitable to them.

Exam grades may be available as early as the Thursday following exam week (in 'Grades' link). You may make an appointment to discuss your exam and ask questions.

**Attendance:**
The nature of this intensive course makes class attendance mandatory. Missed quizzes cannot be made-up, and missed assignments will be marked late. If for some extenuating circumstance you are unable to attend, please contact me as soon as possible. If you already know that you will not be able to attend each class, I strongly encourage you to take the semester-length version of the course.
Grading:
The course grade is based on weighted percentages of exams, assignments, and quizzes, as follows:

1. Quizzes 20%
2. Assignments 50%
3. Final Exam 30%

Final marks will be awarded based on the final percentage (calculated from the weightings above) converted to a letter grade according to the following straight scale:

>90% (A-, A), 80-90% (B-, B, B+), 70-80% (C-, C, C+), 60-70% (D-, D, D+), <60% (E).

While I don’t curve grades, I do adjust grades based on student performance. For example, if the high score on an exam is 95, then I scale all of the grades based on this score. You can check on your progress to-date at any time by looking in the 'Grades' tab.

ADA:
The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.

Student responsibilities:
All students are expected to maintain professional behavior in the online classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible student behaviors, and I will do so, beginning with warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee.

Accommodations Policy:
Some of the topics in this course may include material that conflicts with the core beliefs of some students. Please review the syllabus carefully to see if the course is one that you are committed to taking. If you have a concern, please discuss it with me at your earliest convenience.