

Earlham College, Geosciences 211, Physical Geology
Spring 2005 4 Credits

Course Description: Geology is one of the most intriguing and exciting disciplines of scientific inquiry. Geologic phenomenon have created the hospitable surface on which humans - and all creatures - exist. As historian Will Durant remarked "Civilization exists by geological consent, subject to change without notice." At no time has this sentiment proven to be more germane than in the aftermath of the December 26, 2004 Sumatran Earthquake and resulting Indian Ocean tsunami. As of 1/16/05, this event is confirmed to have taken at least 160,416 lives. This disaster in countries bordering the Indian Ocean is a direct consequence of geology. A more pervasive global understanding of geologic phenomenon may (hopefully) prevent such abhorrent losses of human life in the future. To quote UN Secretary-General Kofi Annan "The term 'natural disaster' has become an increasingly anachronistic misnomer. In reality, human behavior transforms natural hazards into what should really be called unnatural disasters."

The next 100 years will strain the limits of our Earth for tolerating environmental degradation and resource extraction. The future of humanity on Earth is inexorably linked to strategies that bring all human cultures closer to sustainability. As never before, an understanding of geologic processes and phenomenon is paramount for every citizen of Earth as we confront our future in the 21st century and beyond.

This course explores the breadth of the current state of knowledge of geology, which is the science of the Earth. We start with Plate Tectonics, the revolutionary theory that explains how the world works. Tectonics explains the reason earthquakes, volcanoes, mountains and deserts are situated where they are. We then study the materials that constitute our living planet (minerals and rocks) and then move to the processes that shape and modify our Earth (and have done so back through the abyss of time).

A fundamental objective of this course is that you become conversant in the language of your planet. I aim to foster in you a curiosity that outlives your brief visit to Physical Geology. Years hence, I want you to be able to pick up a rock in whatever continent you happen to find yourself. I want you to be able to read in that rock something that shows you why the horizon you view is as it is. I want you to be able to see backwards into the immensity of time. And, I want to make it so that you are never the victim of a tsunami.

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Ron's webpage: <http://www.earlham.edu/~parkero>

Office Hours Monday and Friday 11:00 - 11:30 PM, 329 Dennis or by appointment.

Class Time: Class Tuesday - Thursday 10:30 -11:50 in 014 Dennis

Web Site: <http://www.earlham.edu/~parkero/211.htm>

Lab Time: Labs will start on Monday, January 24th. Labs will meet in Dennis 314. At the end of the semester (when the weather is nice) laboratory classes will go outside on field trips. One component of your lab grade will be building a web page (described below).

- T A.s:** The course has 2 Teaching Assistants, both senior Geosciences Majors: Kate Burgess (burgeka) and Heather Hoey (hoeyhe). The TAs will help with labs, will offer pre-test study sessions, will be available for questions and will be grading quizzes and homework exercises.
- Textbook:** **Essentials of Geology**, by Stephen Marshak, 2004, New York: W. W. Norton Company. The text is mandatory. If you do not have a text you will struggle mightily in this course.
- Exams:** There will be 3 exams and 1 cumulative final in this course. Exams occur approximately every 7 class meetings. The final exam is May 2nd at 8:00 AM.
- Grading:** Exams/labs/homework/quizzes are 50/25/20/5 % of your grade, respectively. The exams and final are worth 10%, 12%, 12% and 16% of your grade (total of 50%), respectively. Letter grades follow: [A:90 -100%; B:80- 89%; C:70 - 79%; D:60 - 69%; F:<60%].
- Final Exam:** Graduating seniors may forego the final exam under the following conditions:
1.) They have a B+ (87 or higher) average after the 3rd exam, and
2.) They have perfect attendance at lecture and lab classes after the 3rd exam.
- Attendance:** Tuesday vocabulary quizzes and Thursday homework be used to monitor attendance. Good attendance may be considered to help those students with borderline grades.
- Quizzes:** Geology, like many of the natural sciences, has a language all its own. Much of the terminology in the science has specific meaning and knowledge of this meaning assists in developing understanding of concepts. In an effort to help students master the jargon of geology, a list of vocabulary terms will be posted on the class website every Wednesday. Students will be quizzed on the definition of 5 of these vocabulary words at the beginning of many Tuesday classes. Quizzes account for 5% of your total grade. Missed quizzes **cannot be retaken**.
- Homework:** The answers to 6 questions (which are detailed in the Lecture calendar) will be due at the beginning of most Thursday classes. These questions have been selected because they deal with important concepts from the reading and the lecture material. Answers to the questions MUST be complete sentences but need not be excessively long. In most cases a sentence or two may suffice.
- Webpage:** As one component of your lab grade, you will each be required to design a web page that describes a geologic process, phenomenon or event. This will be done over the period of several lab sessions. This has been a favorite part of the course for past students.