

**GEOL 15**  
**Course Syllabus**  
**Introduction to Earthquakes and Geologic Hazards (3 units)**  
Fall 2013 Section E4736  
M&W 2:50-4:15PM Room HMHU125

**Instructor:** Jason Robert Patton

**email:** [jason-patton@redwoods.edu](mailto:jason-patton@redwoods.edu)

**Required Text:** Bruce A. Bolt, Earthquakes, 5<sup>th</sup> ed., 2006

**Required Supplies:** three ring binder for class handouts including blank paper for drawing illustrations and notes during class; colored pencils for making illustrations

Contact: Please don't hesitate to email me with any questions, comments, or concerns. I welcome any feedback or suggestions. The best way to contact me for any reason is by sending an email directly to my College of the Redwoods email [jason-patton@redwoods.edu](mailto:jason-patton@redwoods.edu)

### Course Description

An investigation of geologic and plate-tectonic processes and their relationships to faults, earthquake activity, mountain building, volcanism, landform development, and natural disasters. The course explores plate interactions and the connection to historic geologic disasters including earthquakes, tsunamis, and volcanic eruptions. Students will learn about hazard prediction, preparedness, and societal responses to living within a dynamic geologic environment.

### Course Learning Outcomes

1. Apply the scientific method and scientific reasoning to critically evaluate geologic phenomena.
2. Communicate the basic elements of plate tectonic theory and apply these concepts in describing how earthquakes, or other geologic hazards, impact both humanity and the natural environment.
3. Apply physical science principles to describe how energy is transmitted through geologic systems.

### Grading

Your final grade will be comprised of:

<u>Summary</u>	<u>Points</u>
Course Notes and Illustrations	100
Ten Activities (30 points each)	300
2 Mid Terms 200 points each	400
<u>1 Final Exam</u>	<u>200</u>
Total	1000

There are 1000 points available and grades are assigned by the percentage of total points as follows:

1000-940=A	939-900=A-	899-870=B+	869-830=B	829-800=B-
799-770=C+	769-700=C	699-670=D+	669-600=D	<599=F

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**Classroom Conduct**

Side conversations among classmates are disrespectful and disruptive to the instructor and your fellow students. Questions or comments about the course material are welcome at all times but should be approached in a respectful manner.

The use of cell phones, iPods, or other items that may distract you, your instructor, or your classmates are not permitted during class. All such devices must be turned off.

You may not leave the room during an exam or quiz unless you are ready to turn in your finished exam.

**Academic Honesty**

You are encouraged to work together to review notes from lectures, to work on problems from the text, and to formulate ideas for any take-home assignments. However, all work you turn in must be your own independent, original work.

In the event that any work is copied from another student, zero credit will be given to all students involved (regardless of who copied from whom).

Any sources of information used in your written work must be referenced (regardless of whether the material was copied word-for-word). This includes your text book and all internet sources (reference these by including the name and URL). Any work including un-referenced material from another source (regardless of whether it was copied word-for-word) will be given zero credit.

Academic Misconduct: Cheating, plagiarism, collusion, abuse of resource materials, computer misuse, fabrication or falsification, multiple submissions, complicity in academic misconduct, and/ or bearing false witness will not be tolerated. Violations will be dealt with according to the procedures and sanctions proscribed by the College of the Redwoods. Students caught plagiarizing or cheating on exams will receive an "F" in the course.

Academic dishonesty in any form may be reported to the vice president of CR, as per the student code of conduct available at <http://www.redwoods.edu/District/Board/New/Chapter5/Ap5500.pdf> See in particular page 9, Article VIII which begins "Students are expected to demonstrate qualities of morality, integrity, honesty, civility, honor, and respect."

College of the Redwoods is committed to equal opportunity in employment, admission to the college, and in the conduct of all of its programs and activities.

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**Tentative Class Schedule\***

<u>Date</u>	<u>Topic</u>	<u>Readings</u>
Week 1	Lecture 1: Natural Hazards, Scientific Method, Energy Lecture 2: Earthquakes: Sliding Brick Model, Stress and Strain <u>Elastic Rebound Activity</u>	CH-1
Week 2	Lecture 3: <b>Labor Day 9/2/2013</b> Lecture 4: Origin of the Earth, Earth Structure, Plate Tectonics	CH-2
Week 3	Lecture 5: Plate Tectonics, Plate Interactions Lecture 6: Types of Faults, Association of Faults with Plate Boundaries <u>Triangular Plate Activity</u>	CH-7 CH-3
Week 4	Lecture 7: Seismographs, Networks Lecture 8: Elastic Waves <u>Fault Types Activity</u>	CH-6 CH-4
Week 5	Lecture 9: Earthquake Intensity, Earthquake Location <u>Location Activity</u> Lecture 10: Earthquake Size (Magnitude) <u>Magnitude Activity</u>	CH-5 CH-8
Week 6	Lecture 11: Earthquake Models, Slow Earthquakes, Earthquake Cycles, Creep; Study Guide Mid Term #1 Lecture 12: <b><u>Mid Term #1</u></b>	CH-10
Week 7	Lecture 13: Review Mid Term #1 Focal Mechanisms: "Pictures of Earthquakes" Lecture 14: Focal Mechanisms: Beach Balls <u>Focal Mechanism Activity</u>	
Week 8	Lecture 15: Structure of the Earth, Phase Arrivals, Travel-Time Curves Lecture 16: Seismic Tomography, Shadow zones <u>Focal Mechanism and World Plates Activity</u>	
Week 9	Lecture 17: Geodesy <u>Geodesy Activity</u> Lecture 18: Earthquake Prediction, Seismic Gaps, Segmentation <u>Fault Activity</u>	

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Week 10	Lecture 19: Paleoseismology Lecture 20: Paleoseismology <u>Possible Paleoseismic Activity</u>	
Week 11	Lecture 21: Tsunamis <u>Tsunami Activity</u> Lecture 22: Floods Study Guide Mid Term #2	CH-9
Week 12	Lecture 23: <b>Veteran's Day 11/11/2013</b> Lecture 24: California, North Coast Tectonics <b><u>Mid Term # 2</u></b>	
Week 13	Lecture 25: Review Mid Term #2 Earthquake Engineering, Hazards Mitigation Lecture 26: Landslides	CH-11 CH-12
Week 14	Lecture 27: Volcanoes Lecture 28: Volcanoes/Plate Boundaries	
Week 15	Lecture 29: wild card/catch up Lecture 30: wrap up/closure/ Study Guide Final	
Week 16	FINAL WEEK, <b><u>Final</u></b>	

**\* Note: Instructor reserves the right to make changes to course schedule as deemed necessary.**

**College of the Redwoods Resources and Information**

Special accommodations: College of the Redwoods complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request at least one week before the first test so that necessary arrangements can be made. No last-minute arrangements or post-test adjustments will be made. If you have a disability or believe you might benefit from disability related services and may need accommodations, please see me or contact Disabled Students Programs and Services. Students may make requests for alternative media by contacting DSPS.

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**Course Information and Assessment**

Mid-Term/Final Exams: The 2 midterms and final are worth 200 points each. The exams are a mix of multiple choice, true/false, short answer, and essay questions based on the lectures, activities, homework, and course reading. Mid-term exams cover the material since the beginning of the course or the last exam, or whatever is most recent. The final is cumulative and will focus on the “big picture” view that is comprehensive of all subjects covered earlier in the course, in addition to the new material covered since the second mid-term. As a part of the grade for the final, each student is required to submit a multiple-choice question for the Final Exam based on their experience in class.

Missing an exam: All make-up exams should be arranged for in advance when possible. In the event of an emergency or sudden illness that prevents you from attending the exam, you must contact me as soon as possible and arrange a time for the exam to be completed before our next regular class time. If you miss an exam (and do not contact me to make it up) or if you arrange a makeup that you do not take, you will receive a zero for that exam.

Course Notes and Illustrations: Each lecture may include handouts (of the presentation for that day) and several on-board illustrations that relate to the specific topic being discussed for that day. You can use the handouts to take notes and your notebook to copy and label any illustrations. You are required to have a three-ring binder containing these handouts and your notes taken during every class. You will turn in your notebooks at the end of the semester along with your activities and homework that has been completed through the semester. These will be evaluated during the Final exam. Credit is given for careful reproduction of the illustrations including any notes, labels, and graphs.

Activities: Each week we will focus on a specific topic and we will use some of the class time to develop these themes. Some weeks will include activities. You may need to spend some time out of class completing the activities. There are 10 activities throughout the course, each worth 30 points and they are due by the beginning of the following class.

Reading: In this syllabus I provide a list of required reading in the Bolt text *Earthquakes* textbook for each week. The student is expected to read the assignment before class. This reading is essential to your comprehension of the material in this course and will be a key to your success. Periodically I will ask you questions from the reading at the beginning of class, before we have covered the material in lecture. These answers will count towards your activity grade for the day and can count towards the “active attendance grade boost” (see below).

**\* Please note that this document is informational and subject to change.**

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**Course Expectations**

Class will start on time at 2:50 PM. You are responsible to be present for and be attentive to all the material covered in class. If you need to leave the class early, please let me know before the class starts.

This is a college-level science class, and will require a commitment of your time outside of class. This at-home time will enable you to digest the material we cover in class and help when you are asked on the exams to apply these concepts to different problems and applications.

You will spend 6 to 9 hours per week on course material outside of class. You are encouraged to set aside a specific time each week outside of class devoted solely to each course:

- o Reviewing lecture notes and in-class exercises each week
- o Reading the textbook
- o Working on the recommended exercises from the textbook
- o Completing experiment write-ups and homework assignments
- o Studying for exams

Note that 6 hours per week at home is the average minimum to pass. Some students may require more time at home just to pass; for some in this course that may be enough to get an A. A student who is very attentive in class, asks questions, and takes careful notes will need less at-home time.

Absences: It is difficult to do well in this class without attending all the lectures. I understand there will be an occasional absence due to illness or emergency, however I consider more than two to three absences per semester excessive. If you do miss a class:

1. Obtain the course material online (PowerPoint slides, extra reading, and handouts). The slides will include information about any homework or in-class exercises that were assigned. Most assignments and handouts referenced by the slides will be in your handouts.
2. Next, try to obtain a copy of lecture notes from a classmate since there are many things we cover that are not spelled out directly on the slides or handouts.
3. Read the required reading covering the material you missed.
4. After this, feel free to contact me by email with any questions.

Pop Quizzes: These are for extra points.

Final grade active attendance boost: If your final course grade after rounding to the nearest whole number is within 1 point of a grade transition (C to C+, D to C, A- to A,

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etc.) I will give you the boost needed to obtain the higher grade if you have actively attended most classes and succeeded in many of the in-class pop quiz questions. More than 2-3 unexcused absences is considered excessive and will disqualify you from this opportunity. Conduct not in accordance with that outlined below will also prevent you from receiving this bonus.

Computer skills: This class will require computer use outside of class. Activities involving the 4 skills listed below will be included throughout the semester. In addition, you will be expected to check myCR regularly for announcements. If any of the items listed below seem foreign to you, you are encouraged to sign up this semester for CIS 100 "Basic Computer Skills", a beginning computer literacy course at CR.

1. Send and receive email from your CR Google email account.
2. Open a web browser, and access a web page if you are given the web address.
3. Access course material (handouts, slides, announcements, etc.).
4. Open Microsoft word (.doc or .docx), Microsoft Excel (.xls or .xlsx) and Adobe .pdf documents to read their contents.

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