

# Geol 600 Notable Historical Earthquakes

*Instructor:* Kim Olsen, GMCS 231A, ph 619 594 2649

*Reading Material:* Selected published material distributed in class

*Grading Policy:* Student Class Presentations 60%, Midterm 20%, Final Exam 20%

## INSTRUCTOR CONTACT INFORMATION

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**Office Hours:** TBA or by appointment

**COURSE DESCRIPTION:** The course is intended as an overview of selected historical earthquakes that have significantly impacted our knowledge about seismology, earthquake physics, or earthquake engineering. The course will use available seismic data and rupture models and descriptions of societal impact for the selected events, including loss of life and property. The general course structure will be student presentations of information assembled on selected historical earthquakes and discussion.

## LEARNING OBJECTIVES

**As a result of this course, the student is expected to be able to**

- Understand techniques to invert for earthquake rupture parameters
- Understand recorded seismograms representing damaging ground motion
- Understand the seismic response of sedimentary basins on built environments
- Understand building safety standards and their relation to seismic hazards
- Obtain knowledge of the timing and societal impact of significant historical earthquakes

## TENTATIVE LECTURE AND LAB CALENDAR

Week 1	Overview of course objectives, sources of information on earthquake data
Week 2	Earthquake magnitude, effects of earthquake rupture parameters on ground motions, methods to estimate earthquake rupture parameters
Week 3	Effects of heterogeneous earth structure on seismic ground motions, methods to simulate earthquake ground motions
Week 4	Response of seismic ground motion on buildings, building codes
Week 5	Secondary earthquake-triggered effects (tsunamis, mud/rockslides), earthquake medical response
Weeks 6-14	Student presentation of material related to assigned historical earthquakes. Candidate events include:  1700 M9.0 Pacific Northwest 1755 M8.7 Lisbon, Portugal 1811-1812 M7-8 New Madrid

1857 M7.9 Fort Tejon
1906 M7.8 San Francisco
1923 M7.9 Kanto
M6.4 1933 Long Beach
M9.5 1960 Chile
M9.2 1964 Alaska
M6.6 1971 San Fernando
M7.0 1989 Loma Prieta
M7.3 1992 Landers
M6.7 1994 Northridge
M7.6 1999 Taiwan
M7.6 Izmit, Turkey
M6.8 Nisqually, Washington
M7.9 2002 Denali
M9.1 2004 Sumatra-Andeman
M7.9 China

## **GRADING**

- This course is graded on the following scale:

Grade	Percentage (%)	Grade	Percentage (%)
A+	97-100	C+	77-79.9
A	93-96.9	C	73-76.9
A-	90-92.9	C-	70-72.9
B+	87-89.9	D+	67-69.9
B	83-86.9	D	63-66.9
B-	80-82.9	D-	60-62.9
		F	<59.9

- Grades will be based on the following point system:
  - Student Presentation of Relevant Class Material 60%
  - Midterm 20%
  - Final Exam/project 20%

### **Keep records of all work:**

- Maintain a record of your course work (homework and exam grading) at least until you have received your grade following completion of the course. If you believe an error exists contact me immediately.

## **MIDTERM AND FINAL EXAM/PROJECT**

- Course grades will be based on the performance in the student presentations, midterm and final exams/project. The midterm and final exams will be given during a class period and will last approximately 2 hours. The final exam will be given during finals week and will last approximately 2 hours. The final exam will be accumulative with an emphasis on the material covered after the midterm. The final exam may occasionally be replaced by a class project, if

agreed upon by instructor and students, and is carried out during the last couple of weeks of the course in consultation with the instructor.

- Any material covered by lectures, student presentations, videos and lecture notes may be included on the exams.
- If you know that some obligation will prevent you from attending class on the date of an exam, it is your responsibility to inform the instructor at least one week before the scheduled exam date.

### **Homework**

- Weekly computer homework exercises based on matlab will be assigned throughout the semester.
- Late assignments will receive reduced credit unless late delivery is agreed upon by the instructor.

### **Class Website**

- Lecture notes and homework assignments will be handed out in class. Computer programs and matlab scripts required in the homework can be downloaded from the instructors homepage.

### **Planning Time:**

- Students that get A's, B's, and C's use their time wisely. The standard formula for college coursework is that every hour of in-class time will result in two to three hours of homework, so a three unit class will do an average of six or more hours of homework per week. As a result, successful students plan their time wisely so that they keep up with assignments. They also meet with the instructor during office hours so that they can get much needed feedback on their work.

### **Plagiarism:**

- Always make sure your work is original. An instructor must be able to gauge what the student has learned. Therefore, copying the work of another person is considered plagiarism.
- Plagiarism is a form of cheating. Any time a student uses someone else's work and does not give that person credit, it is plagiarism. Anyone who plagiarizes will receive a "0" on the assignment. If you are "suspected" of plagiarism, you will bear the burden of proof. You must be able to present rough drafts or related materials and discuss the topic intelligently.
- Students who violate university standards of academic integrity are subject to disciplinary sanctions which include failure in the course and possible suspension from the university. Since dishonesty in any form harms the individual, other students and the university, policies on academic integrity are strictly enforced. I expect that you will familiarize yourself with the academic integrity guidelines found in the current student handbook. Any violation of SDSU academic integrity will be reported to the Student Affairs Office.

### **Classroom Conduct:**

- Please **turn off all beepers, cell phones, and watch alarms** that make noise before coming into class; they are a serious distraction in college classes and will not be tolerated.

### **USE OF CLASSROOM TIME**

#### **Communicating in Class:**

- I encourage students to communicate with me and to work out difficult questions or problems. I am always approachable, so please do not feel or assume that I am "too busy" to talk with you. If I am too busy at that particular moment, I will tell you and offer an

alternative time. Let me know if you are going to miss a class or if you are having trouble completing an assignment.

**Attendance:**

- Grades are dependent on homework, exams and student presentations. Attendance is not required, but if you attend you must be ON TIME as a courtesy to other students.

**Dropping the Class:**

- Students who choose not to continue the course are responsible for dropping the course by the specified dates (listed above and on the Schedule of Classes). Please do not assume that I have filed a drop card. Failure to officially drop the course may result in an "F". When in doubt, communicate with me.

**YOUR INSTRUCTOR**

**Information about me:**

- If you would like to know more about me and my academic or professional history, or would like to read any of the articles I have published, please take a look at my website.

**What to expect from me outside the classroom:**

- In order to meet all of my professional obligations, I plan my schedule carefully. While I might wish to be available for your questions 24/7, that is simply not possible. Please be advised that I regularly check my e-mail messages throughout the day during the week.

**What you can expect when your homework for grading:**

- I will make every effort to return homework on a weekly basis and return exams and quizzes within one week. Occasionally, other professional obligations make this impossible. I make written comments to explain erroneous answers in the homework and exams. If these comments are insufficient for you to understand your grade, please make an appointment to discuss your work.

**Questions about course content**, grading, study habits, and so forth are welcome.