GEOL 104: Living with Earthquakes in California (Fall 2018)
Tuesdays and Thursdays, 2:00 - 3:15 PM, Live Oak 1219

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California is earthquake country. From the long-term evolution of the landscape to the
damage brought on by a few short seconds of strong shaking, living in California means
having your life shaped by seismic activity in some way or another. Over the course of the
semester, we will come to terms with our faults, and build a foundation of general
earthquake knowledge. We will begin with the science of how earthquakes work, why
California has so many, and how seismologists have come to understand this hazard. But
getting a handle on the science is only part of living with earthquakes; we will also address
the topics of earthquake-resistant engineering, mitigation and preparedness from the
individual to the government scale, how science affects policy, the much-misunderstood
issue of earthquake prediction, and how hazard and risk are conveyed to everyday people
and communities. My hope is that, by the end of the semester, you will feel more informed
about and prepared for that inevitable earthquake, and that you will all be able to be
earthquake awareness advocates to your families and communities.

This course fulfills a General Education Lifelong Learning requirement for a bachelor’s
degree at CSUN. This course addresses the Lifelong Learning objectives via: (1) integration
of knowledge about the process of earthquake formation and recognition from the geologic
record (science); (2) how technologies such as monitoring of Earth deformation using
seismometers, GPS, tsunami warning systems, and other sensors are used to characterize
earthquake hazard (technology); and (3) how those data are used to inform the insurance
industry, engineers, local, state and national hazard mitigation organizations, and
individuals as they implement change to limit impacts from earthquake-related hazards
(society).

By the end of this course, you should be able to:
• Recognize that scientific data caused a paradigm shift in society’s perception of
natural hazards in California.
• Describe the earthquake cycle.
• Identify major faults and physiographic provinces of California on a map.
• Analyze evidence for past earthquakes from geologic data and strain accumulation
leading up to earthquakes.
• Describe factors that contribute to earthquake ground motion.
• Describe secondary hazards that may be induced by earthquakes.
• Assess earthquake hazard at a site based on geologic maps, fault maps, and past
earthquake history.
• Differentiate between earthquake forecasting and prediction.
• Compare and contrast how Local, State, and National emergency response organizations have shaped policy related to earthquake hazards.
• Justify societal concerns about hazards using historical analysis of news reports and other sources.
• Evaluate the validity of a mainstream media story about earthquakes.
• Summarize the main historical, economic, scientific and technological information used to create earthquake coverage by the insurance industry.
• List the major earthquake-related variables used by engineers to address societal needs for safe dwellings, workspaces, and transportation corridors.
• Interpret available data for earthquake hazards to develop a mitigation plan.
• Summarize case studies where individuals and communities have developed and participated in hazard mitigation strategies.
• Describe the linkage between societal impacts arising from earthquake disasters and response by the Federal Government in the form of earthquake preparedness, mitigation, and legislation.
• Synthesize concepts developed in the course to write a term paper that includes critical evaluation of information related to earthquake awareness.

There are no required texts for this class.
There have been in the past, but they are out of date to the point of being out of print. All of the material that will be covered on the tests will be addressed directly in class, and I will provide handouts each class listing the key topics for that lecture. Additionally, I will post relevant and interesting articles on Canvas throughout the semester. I strongly suggest that you take good notes, as that will make it easier for you to study later.

Your Responsibilities
1. Come to class prepared. This means being up to date on previous lectures, and being ready to answer questions and discuss with me and with each other.
2. Respect your classmates and professor. There will be a lot of discussion in this class, and a group project as well, so please treat everyone as you wish to be treated in a learning environment. Respect includes being on time, paying attention to each other, and putting social media away during class.
3. Please let me know as soon as possible if you will be absent or unable to turn in an assignment as listed in this syllabus. You may not always be able to make up for the work, but the later I find out that you may miss something, the harder it will be for me to make accommodations for you.
4. If you need any special physical or learning accommodations, please let me know as soon as possible. I can’t account for things that I don’t know about.

My Responsibilities
I am here to help you learn. I certainly hope that I can also instill some enthusiasm about this topic in you, but at the very least, I am here to help you learn this material. I cannot do the learning for you, but I’ll do what I can to facilitate. You can expect me to be available for class and office hours, and readily reachable by email.
Your grade is based on total points earned out of 500:

1. **In-class discussions and exercises, out-of-class Canvas quizzes** (50 points)
2. **Exams** (200 points total)
   - Midterm: 11 October 2018, during class (100 points)
   - Final: 13 December 2018, 3:00 – 5:00 PM (100 points)
3. **Field trip participation** (50 points)
   - Saturday, 13 October 2018, 9 AM to approximately 5 PM
4. **Preparation for and presentation of group project** (100 points)
   - Presentation date: 15 November 2018, during class
   - For this project, you will be working in groups of ~3 to assess the earthquake hazard and risk at different sites across California. You will be making a poster with this information, and presenting as part of a poster session, at least to your classmates if not to the larger campus community.
5. **Final paper** (100 points)
   - Due date: 14 December 2018, on Canvas, by 11:59 PM
   - You will each be writing a five-page (double-spaced) paper on an earthquake-related topic of your choice.

**Late Assignment Policy**

For papers and group projects, I will deduct 20% from your grade for each day the assignment is late, including weekends and holidays.

Assignments that are to be completed on Canvas are short, are graded entirely on completion, and will be open for at least a week each. Once these are closed, they’re closed, and cannot be made up.

If you absolutely cannot attend the mandatory field trip on the scheduled day, I will give you instructions on how to complete the trip on your own and provide proof that you did so.

If you know you will not be able to attend a project work day or an exam, you must let me know in advance. I will allow you to reschedule or make up for work if you let me know beforehand, but I will not accept the excuse of a scheduled conflict if you only tell me after the fact.

If you miss a project work day or exam due to an emergency, I will only let you reschedule or make up for it if you can provide me proof for your excuse.

**Dr. Lozos’ Email Policy**

If you have a question or are confused about something, by all means, email me! You don’t have to wait until office hours to come talk. That said, here are a few things to keep in mind.

- I get a lot of email, and my spam filter is more aggressive than I’d like. If you haven’t heard back from me within 36 hours of sending your message, please send me a reminder.
- If you email me less than 12 hours before class (i.e. later than 2 AM on Tuesday or Thursday), I do not guarantee you a response before class.
- I set aside my Fridays for my own research. Don’t expect a response from me on a Friday.
Course Schedule

Week of 27 August
28 August — Introduction
30 August — Earthquake common knowledge, myths, and misconceptions

Week of 3 September
4 September — Plate tectonics
6 September — How faults work

Week of 10 September
11 September — No class (in exchange for field trip)
13 September — Seismic waves and ground motion

Week of 17 September
18 September — Secondary effects of earthquakes
20 September — California tectonics and the San Andreas Fault

Week of 24 September
25 September — The San Andreas Fault and friends
27 September — Other faults of California

Week of 1 October
2 October — How scientists study earthquakes
4 October — Group project introduction and planning

Week of 8 October
9 October — Review for midterm
11 October — Midterm
13 October (Saturday) — Mandatory field trip, 9 AM to approximately 5 PM

Week of 15 October
16 October — Risk, mitigation, and insurance
18 October — Engineering for earthquake resistance

Week of 22 October
23 October — No class (in exchange for field trip)
25 October — No class (in exchange for field trip)

Week of 29 October
30 October — Group project work day
1 November — Walking tour of buildings on campus; final paper topics due by 11:59 PM

Week of 5 November
6 November — The role of government in earthquake mitigation
8 November — Personal earthquake preparedness
Week of 12 November
13 November — Group project work day
14 November — If you would like Dr. Lozos to print your poster, he needs a pdf by 2 PM
15 November — Group project presentations

Week of 19 November
20 November — Early warning, forecasting, and prediction
22 November — No class (Thanksgiving)

Week of 26 November
27 November — In search of earthquake precursors
29 November — Predictions from the fringe

Week of 3 December
4 December — Earthquake science, prediction, and the media
6 December — Final exam review

Week of 10 December
11 December — No class (finals week)
13 December — Final Exam (3:00 - 5:00 PM)
14 December — Final papers due on Canvas by 11:59 PM