

CVEN 6595: Earthquake Engineering

[Time] Tues. and Thurs. 3:30-4:45 PM
[Location] ECST 1B21
[Instructor] Professor Abbie Liel
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[Email] abbie.liel@colorado.edu
[Office Hours] Mon/Wed 2-3:30 PM. Email me to
Schedule an appointment at other times.



[Other] All course documents will be available on CULearn. Check your email for updates on course schedule and assignments.

Course Description and Objectives

The goal of this course is for you to develop an understanding of both the theory and the practice of earthquake engineering. By the completion of this course you should be able to:

- (1) Analyze the dynamic response of simple and complex structures to seismic ground motions
- (2) Conduct probabilistic seismic hazard analysis to predict the severity of ground-shaking at a given site given the seismological characteristics of the region
- (3) Explain the important principles of seismic design
- (4) Design a reinforced concrete or steel structure that meets seismic building code requirements
- (5) Evaluate the seismic performance of an existing structure

Course Requirements and Assessment

The lectures, homework assignments, research questions, final project and exams will explore the critical aspects of designing and analyzing structures to resist earthquakes. In-class time will be spent in lectures, problem solving and discussion. Attendance is critical for developing understanding and skills needed for homework assignments and exams. If you miss class, it is your responsibility to collect materials from other students..

Your grade in this course will be weighted as shown for a total of 100%:

- Weekly homework assignments [25%]
- Mini research projects [15%]
- Midterm [15%]
- Final [25%]
- Final project [20%]

The grading scale is as follows -- A: 90 to 100%, B: 80 to 89.99%, C: 70 to 79.99%, D: 60 to 69.99% F: 59.99% and below.

Exams

The midterm exam is scheduled to be held in class on **Thursday October 12**. The final exam is scheduled for **Thursday December 16** from 7:30 to 10:00 AM. Both exams will have a conceptual (closed book) section and a computational (open book, open notes) section.

Homework Assignments and Research Questions

You have the choice of submitting your assignment individually or in groups of 2. Homework will be graded on a scale of 100. Not late submissions will be accepted, but the lowest homework grade will be dropped. Homework assignments will be graded both for numerical answers and conceptual understanding – so don't worry too much if you made a calculation error but your thought processes are correct! For those assignments that require Matlab, it is available in the Bechtel lab.

Research questions will also be graded out of 100 points and should be completed individually. Grading will be based on the completeness of your research, the clarity of writing and presentation and citation of sources.

Final Project

There will be a significant design project, which we will begin in late September. You should plan on spending significant time on the project in October and November.

Textbook

Elnashai, Di Sarno, Fundamentals of Earthquake Engineering, 1st Edition, John Wiley & Sons, Inc., 2008. *Recommended*. Any materials that are essential for the course will be posted on CuLearn.

Comments

I am always happy to meet with you to discuss your progress in the course or suggestions for how the class can be improved. Please feel free to stop by during office hours or to schedule an alternative appointment.

Other Policies

- (1) If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services in a timely manner so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671 Willard 322.
- (2) Campus policy regarding religious observances requires that faculty make every effort to accommodate students who, because of religious obligations, have conflicts with scheduled exams. Please notify me early in the semester so that we can make alternative arrangements.
- (3) All students at the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at <http://www.colorado.edu/policies/honor.html>.
- (4) The University of Colorado at Boulder policy on Discrimination and Harassment (<http://www.colorado.edu/policies/discrimination.html>), Sexual Harassment and Amorous Relationships applies to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based on race, color, national origin, sex, age, disability, sexual orientation or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh>.