

CE 445 PRINCIPLES OF EARTHQUAKE RESISTANT DESIGN
Fall 2026-2027

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Classes: Wednesday 8:45-10:30
Thursday 13:30-15:15

Recommended

Texts:

- Earthquakes, Bruce A. BOLT, Freeman
- Seismic Design of Reinforced Concrete Buildings, Jack MOEHLE, McGraw Hill, 2014
- Basic Earthquake Engineering, Haluk SUCUOĞLU, Sinan AKKAR, Springer, 2014
- The Seismic Design Handbook, Farzad NAEIM, Kluwer Academic Publishers -
- Geotechnical Earthquake Engineering, Steven L. KRAMER, Prentice Hall
- Earthquake Engineering From Engineering Seismology to Performance Based Design, Yousef BOZORGNI, Vitelmo V. BERTERO, CRC Press
- Dynamics of Structures, Anil K. CHOPRA
- Türkiye Deprem Yönetmeliği 2018
- Betonarme Yapıların Tasarımı ve Yapım Kuralları, TS500, 2000

Tentative Course Outline:

1. Introduction
2. Earthquakes
Structure of the Earth, Tectonic Plates, Faults, Seismic Waves, Magnitude and Intensity
3. Response of SDOF Systems to EQ Excitation
4. Earthquake Response and Design Spectra
5. Response of MDOF Systems to EQ
Vibration Modes, Orthogonality, Modal Expansion of Displacements, Solution of Equation of Motion under EQ excitation, Modal Superposition
6. Analysis Procedures and Basic Principles
Dynamic Degrees of Freedom, Dynamic Parameters of a Building, Analysis Procedures in Building Codes, Equivalent Static Lateral Load Procedure, Modal Response Spectrum Analysis, Nonlinear Static Analysis (Pushover), Basic Design Principles and Performance Requirements, Structural Irregularities, Drift vs Shear
7. Seismic Design of Reinforced Concrete Structures

Grading:	Midterms	48%
	Group Project	18%
	Final Exam	40%
	Participation	5%

Attendance Policy: Failure to attend at least 70% of class hours will result in an NA (Non-Attendance) grade rather than a standard letter grade. *Exception:* Any student who achieves an overall passing

grade from their performance will be exempt from the attendance requirement and will receive their earned letter grade.

Cell Phone Policy:

Please keep cell phones put away during class and exam hours. Students who do not follow this policy will be dismissed from the classroom for that session. If you need to check your phone for an urgent situation, please ask the instructor for permission.

Recitation: There will be frequent online recitations. Schedule will be organized.