

CE 424 INTRODUCTION TO EARTHQUAKE RESISTANT DESIGN
Spring 2025-2026

Instructor: *Dr. Cemalettin Dönmez*
Izmir Institute of Technology, Civil Engineering Department
Room #: C-207 Phone #: 750-6811, cemalettindonmez@iyte.edu.tr

Classes: **Thursday 8:45-11:30**

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 BOZORGNIA, Vitelmo V. BERTERO, CRC Press
- Dynamics of Structures, Anil K. CHOPRA

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 Seismic Design of Building Structures**
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:	Assignments (4x5)	20%
	Midterm	35%
	Group Project	25%
	Final Report	20%
	<hr/> Total	100%