IZMIR INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING

CE 430 – REINFORCED CONCRETE

FALL 2025-2026

Instructor

Selçuk SAATCI | e-mail: selcuksaatci@iyte.edu.tr | Phone: 750 68 14

Course Summary

This course focuses on the reinforced concrete member design, fundamentals of which were introduced in the third year reinforced concrete course. Bending behavior of reinforced concrete members will be revisited, emphasizing the general moment-curvature behavior and plastic hinge concept. Redistribution of forces in reinforced concrete members in plastic range will be covered. Seismic design principles and fundamentals of capacity design will be introduced using the provisions of Turkish Earthquake Code. The course will also include some basic topics of reinforced concrete member design that were left outside in the previous course, including deflections in reinforced concrete members, biaxial bending of rectangular columns, design for torsion and reinforcement detailing considering bond and adhesion of reinforcing bars.

Course Topics

- Bending Behavior – Moment-Curvature Relationships
- Plastic Hinge Concept and Redistribution
- Seismic Design Principles, Capacity Design
- Biaxial Bending of Rectangular Columns
- Deflections
- Torsion
- Detailing

Evaluation: Assignments (%10), Midterm Exams (2x30%), Final (%30)
(Weights are tentative)

References

- Reinforced Concrete. U. Ersoy, G. Özcebe, T. Tankut. Middle East Technical University Press, Ankara, 2008.
- Reinforced Concrete: Mechanics and Design, James G. MacGregor, Prentice Hall, New Jersey, 1997.
- TS 500: Requirements for design and construction of reinforced concrete structures, Türk Standardları Enstitüsü, Ankara, 2000.
- Deprem Etkisi Altında Binaların Tasarımı İçin Esaslar, 2019.
- ACI 318-19: Building Code Requirements for Structural Concrete, American Concrete Institute, 2019.