IZMIR INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING

CE 422 – STRUCTURAL DESIGN: CONCRETE STRUCTURES

FALL 2024-2025

Instructor

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Assistant

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Course Summary

This course provides the fundamentals of reinforced concrete structural design, emphasizing the principles of seismic-resistant design. Students will engage in a step-by-step approach to designing a reinforced concrete structural system for a building. The course covers essential stages, including selecting an appropriate structural load-resisting system, calculating loads, conducting preliminary design of members, and performing preliminary structural analyses using approximate methods. Further structural analyses will be carried out using computer programs, followed by design verification according to relevant structural codes. Key principles of earthquake-resistant design will be introduced with reference to the Turkish Earthquake Code.

Course Topics

- Introduction to Design Problem
- Structural Systems
- Load Distribution in a 3-D Frame Structure
- Analysis and Design of Slab Systems
- Approximate Methods of Analysis for Multistorey/Multispan Frame Structures
- Numerical Modelling of Structures
- Design for Earthquake Resistance

Evaluation: Midterm Exam (%35), Final Exam (%35), Term Project (%30)
(Weights are tentative)

References

- Deprem Etkisi Altında Binaların Tasarımı İçin Esaslar, 2019.
- TS 500: Requirements for design and construction of reinforced concrete structures, Türk Standardları Enstitüsü, Ankara, 2000.
- TS 498: Yapı elemanlarının boyutlandırılmasında alınacak yüklerin hesap değerleri, Türk Standardları Enstitüsü, Ankara, 2021.