İstanbul Technical University – Department of Architecture

MIM 234E – Reinforced Concrete Structures, 22157 (22159)

Course Syllabus | 2019-2020 Spring Semester

Course Day and Hour : Tuesday, 08:30-10:30, Friday, 8:30-10:30
Course Room :
Course Credit :
Course Web Site :

Course Instructor: Dr. Haluk Sesigür, Dr. Öğretim Üyesi Cenk Üstündağ
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Course Assistant/s:
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Course Description

Within the context of the course the following subjects are given; Related building codes and structural analysis methods for principles of ultimate strength theory, designing beams under bending (rectangular and T sections, cross-sections with double reinforcement), columns, beams under shear, one-way and two-way RC slabs, RC load bearing systems, stages of design, application projects, loads cases, principles of design of load bearing systems, slab systems, joints, tall buildings, behavior under lateral loads , roofs, precast systems, plates, reinforced concrete frames, arches, shells, cylindrical and double curvature shells, folded plates, principles of Turkish Seismic Code. At the end of the course, students are expected to be capable of configuring proper reinforced concrete structural systems and designing and detailing of beams, columns and slabs.

Course Structure and Plan

Course Plan

WEEK	DATE	TOPIC
1	11.02	INTRODUCTION, PROPERTIES OF CONCRETE
1	14.02	LOAD BEARING SYSTEM, DESIGN PHASES,APPLICATION PROJECT
2	18.02	REINFORCEMENT, PROPERTIES OF RC, LOADS, ULTIMATE STRENGTH METHOD
2	21.02	PRINCIPLES OF LOAD BEARING SYSTEM CONFIGURATIONS
3	25.02	DESIGN OF SINGLY REINFORCED RECTANGULAR BEAMS
3	28.02	DESIGN OF SINGLY REINFORCED RECTANGULAR BEAMS
4	03.03	PROBLEM SOLVING
4	06.03	SLAB SYSTEMS
5	10.03	DESIGN OF FLANGED BEAM SECTIONS, BEHAVIOUR OF DOUBLY REINFORCED RECTANGULAR BEAMS
5	13.03	STRUCTURAL/SEISMIC JOINTS
6	17.03	PROBLEM SOLVING
6	20.03	LATERAL LOAD RESISTING SYSTEMS
7	24.03	DESIGN OF COLUMNS, INTERACTION DIAGRAMS
7	27.03	FOUNDATIONS
8	07.04	PROBLEM SOLVING
8	10.04	MIDTERM EXAM-1
9	14.04	MIDTERM EXAM-2
9	17.04	FRAMES, CANTILEVERS, ARCHES, RC PREFABRICATED STRUCTURES
10	21.04	DESIGN OF BEAMS FOR SHEAR
10	24.04	SHELL STRUCTURES
11	28.04	DESIGN OF ONE-WAY SLAB SYSTEMS
11	01.05	NATIONAL HOLIDAY
12	05.05	PROBLEM SOLVING
12	08.05	FOLDED PLATE STRUCTURES
13	12.05	DESIGN OF TWO-WAY SLAB SYSTEMS
13	15.05	TALL BUILDINGS
14	19.05	NATIONAL HOLIDAY
14	22.05	SEISMIC CODE PROVISIONS FOR EARTHQUAKE RESISTANT DESIGN

Recommended Readings

1. **Reinforced Concrete: Mechanics and Design (6e),** J.K.Wight, J.G. MacGregor, Pearson Higher Ed USA, 2011.

2. **Earthquake Resistant Buildings from RC,** A.Konstantinidis, 2010

3. **Seismic Conceptual Design of Buildings-Basic Principles for engineers, architects, building owners,** H.Bachmann, 2003

4. **Betonarme,** İ. Aka – F. Keskinel – F. Çılı – O.C. Çelik, Birsen Yayınevi (Pub.), 2001

Course Assessment

Assessment criteria is based on the scores of two homework assignment, two mid-term exam and one final exam.The effect of the homework assignment score and the mid-term exam score on the total mid-term score is 20% and 80%, respectively. In order to qualify for the final exam, course attendance should not be below 70% and at least 40 points out of 100 must be obtained as the total mid-term score. The effect of the total mid-term score and the final exam score on the overall success grade is 40% and 60%, respectively.

Total mid-term score: 80% two mid-term exam score, (10% +10%) two homework assignment score
Qualification for the final exam: 70% course attendance and min. 40 points out of 100 as total mid-term score
Overall success grade: 40% total mid-term score, 60% final exam score

Contributors

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