

CE 49D REINFORCED CONCRETE DESIGN

Elective Course

Spring 2009

Instructor : Uğur Ersoy
Course Data :
Hours : W 6 7 8
Room M 1171

Course Description:

CE 49D Reinforce Concrete Design

(3+0+0)3

(New course, not included in the catalog)

Discussion of basic steps in design and design principles. Design of RC slabs and footings, second order effects in long columns. Fundamentals of seismic design. Behavior and design of structural walls. Approximate methods. Detailing. Case studies.

Prerequisite: CE 351 Reinforced Concrete

Course Objectives (Learning Outcomes):

Emphasis on behavior of reinforced concrete members and structures

To enable the students to apply the theory to practice

To make the students familiar with engineering problems by discussing case studies.

To encourage independent work

Textbook:

No text book

Reference Books;

Ersoy, U., Özcebe, G., and Tankut, T., “Reinforced Concrete”, METU Publication, Ankara, 2008.

Ersoy, U., “Reinforced Concrete 2”, Evrim Publishers, Istanbul 1996.

“Requirements for Design and Construction of Reinforced Concrete Structures, TS-500”, Turkish Standards Inst., Ankara, 2000.

Curricular Context:

This elective course enables the students to apply the theory and principles learned to real design problems. Estimated design content of the course is 90%.

Laboratory and Computer Usage:

In designing the given building (term project) the students use the available computer programs.

Class Policies:

Nine homeworks are assigned based on the topics discussed (5% of the course grade)

Two midterm exams (40% of the course grade)

Term project, building design (25% of the course grade)

Final exam (30 % of the course grade)

Contribution of the Course to Program Outcomes:

(c) An ability to design a system, component, or process to meet desired needs

(e) An ability to identify, formulate and solve engineering problems

(k) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Course Assessment:

Course will be assessed on the basis of accomplishments regarding the course objectives. It will be student evaluation.

Week	Topics	Homeworks	Content
1	Review	HW: 1	
2	Structural Systems	HW: 2	Classification of structural systems. Behavior of these structural systems.
3	Design of Slabs	HW: 3	Types of slabs. Design of one-way and two-way solid slabs. Design of joist slabs. Discussion of flat plates
4		HW: 4	
5			
6	Design of Footings	HW: 5	Types of footings. Design of wall footings, column footings and continuous footings
7		HW: 6	
8	Slender Columns	HW: 7	Second order moments in columns. Approximate methods for finding second order moments
9	Preliminary Design	-	Setting up the structural system and proportioning of members. Rules of thumb!
10	Introduction to Seismic Design	HW: 8	Design spectra. Design in accordance to the Turkish seismic code
11	Approximate Methods	HW: 9	Shortcut moment distribution (cross method simplified)
12	Detailing	-	Relation between behavior and detailing. Principles of detailing
13	Structural Problems and Solutions	-	Case studies. Interesting problems encountered in practice and their solutions.