

COURSE CATALOG

Course Code: CE 362				Course Name: Reinforced Concrete			
Semester	T + P + L	Credits	ECTS	Language of Instruction	Course Type	Instruction Methods	Prerequisite(s)
6	3 + 1 + 0	3	6	English	Required (D1)	Lecture	CE 201, CE 202
Course Objectives			Basic concepts of reinforced concrete elements. Safety of structures. Elements under axial loading. Bearing capacity of elements under flexure. Design of beams and columns. Elements subject to shear and torsion. Plates. Foundations. Design of earth retaining structures. Earthquake code.				
Topics Covered			Concrete Producing materials. Mix design, placing and curing of concrete. Reinforced concrete. Flexure in beams. Shear and diagonal tension in beams. Torsion. Serviceability. Continuous reinforced concrete structures and equivalent frame method of analysis. Design of two-way slabs and plates. Footings. Design of columns and walls. Design of earth retaining structures. Analysis methods. Introduction to prestressed concrete.				
Learning Outcomes of the Course			<p>After completing this course students should gain:</p> <ol style="list-style-type: none"> <li>1. formulate and analyze reinforced concrete structures. [2,4]</li> <li>2. have basic understanding of reserve strength and safety factors. [2,4]</li> <li>3. analyze the serviceability behavior of members. [2,4]</li> <li>4. construct interaction diagram for columns. [2,4]</li> <li>5. analyze and design brackets, corbels and deep beams. [2,4]</li> <li>6. design and detail footings. [2,4]</li> <li>7. write their computer programs to facilitate the design process.[2,4,15]</li> </ol> <p><i>[Note that the numbers in between the brackets address the bullet numbers in the program outcomes list.]</i></p>				
ISCED Category of the Course			52 Mühendislik				
Textbook			J.C. MacCormac, J.K. Nelson, Design of Reinforced Concrete, John Wiley&Sons, 2004.				
Recommended Sources			<ol style="list-style-type: none"> <li>1.E. Atımtay, Betonarme Sistemlerin Tasarımı Temel Kavramlar ve Hesap Yöntemleri, Cilt 1 ve Cilt 2, Bizim Büro, Ankara, 2001.</li> <li>2. E. Atımtay, Depremde Çökmeyen Bina Nedir? Nasıl Projelendirilir?,Ankara, 2009.</li> <li>3. E.Celep, Betonarme Yapılar, Beta dağıtım, İstanbul, 2009.</li> </ol>				

WEEKLY SCHEDULE

Week	Theoretical Topic	Applied / Laboratory Topics
1	Concrete Producing materials.	
2	Mix design, placing and curing of concrete.	
3	Reinforced concrete.	
4	Flexure in beams.	
5	Shear and diagonal tension in beams.	
6	Torsion. Serviceability.	
7	Continuous reinforced concrete structures	
8	Equivalent frame method of analysis.	
9	Design of two-way slabs and plates.	

10	Footings.	
11	Design of columns and walls.	
12	Design of earth retaining structures.	
13	Analysis methods.	
14	Introduction to prestressed concrete.	

#### COURSE ASSESSMENT POLICY

	Activities	Number	Contribution (%)
Studies throughout the term	Quizzes	-	-
	Term Homework/ Project		
	Reports	-	-
	Graduation Thesis/ Project	-	-
	Seminar	-	-
	Homeworks	5	20
	Presentations	-	-
	Midterm Exams	2	35
	Project		
	Laboratory	-	-
	Other (attendance)	14	05
FINAL EXAM		1	40
Total			100

#### CONTRIBUTION OF THE COURSE TO CIVIL ENGINEERING PROGRAM OUTCOMES

	Program Outcomes	1	2	3
1	The ability to apply knowledge of mathematics, science, and engineering		X	
2	The ability to identify, formulate, and solve engineering problems			X
3	The ability to design a system or component to meet desired needs with realistic constraints such as economic, environmental, social, ethical, health and safety, manufacturability and sustainability			X
4	The ability to analyze and interpret data			X
5	The ability to design and conduct experiments and apply experimental results to improve processes			X
6	The ability to convey technical material through oral presentations and written papers/reports		X	
7	The ability to function within multidisciplinary teams			X
8	The understanding of professional and ethical responsibilities			X
9	The understanding of the impact of engineering on society		X	
10	The understanding of the necessity to engage in life-long learning			X
11	The understanding of management and leadership principles and techniques		X	
12	The appreciation of the role of research in civil engineering problems		X	
13	A knowledge of contemporary issues in civil engineering		X	
14	The ability to use modern engineering techniques, skills, and tools		X	
15	The ability to understand and explain basic concepts in management, business, and leadership			x

16	A commitment to quality, punctuality and continuous improvement			X
----	---	--	--	---

Contribution Level: 1 low, 2 medium, 3 high

ECTS-WORKLOAD TABLE

ACTIVITIES	Number	Duration (Hour)	Workload(Hour)
Lecture Time	14	4	52
Final Exam (Including Preparation Time)	1	15	15
Quizzes	3	5	15
Term Homework / Project	-	-	-
Reports			
Graduation Thesis/Project	-	-	-
Seminar			
Study Time Outside the Class	14	2	28
Homeworks	5	4	20
Presentations	-	-	-
Midterm Exams (Including Preparation Time)	2	10	20
Project	-	-	-
Laboratory	-	-	-
Total Workload			150
ECTS Credits of the Course (Total Workload / 25)			6

Last update on 19.01.2014	Coordinator / PREPARED BY Esin Inan	APPROVED BY Esin Inan
------------------------------	--	--------------------------