



HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Reinforced Concrete I					
CODE: CE351		SEMESTER: FALL			
LANGUAGE: ENGLISH		TYPE: COMPULSORY			
PRE-REQUISITES: - CO-REQUISITES: -		THEORY	PRACTICAL	CREDIT	ECTS
WEEKLY HOURS: 4		4	0	4	5

CONTENT OF THE COURSE:

This course gives the basic principles for reinforced concrete design of structures based on mechanical properties of structural concrete. Fundamentals and design theories based on ultimate (Limit) strength design and elastic concept. Introduction to Turkish Standard for Reinforced Concrete Design ‘TS-500’, Building Codes and the American Concrete Institute Code ACI. Load factors, structural safety limits. Analysis and design of reinforced concrete members subjected to flexure, shear and diagonal tension in accordance to ACI strength method. Development length of reinforcement.

OBJECTIVE OF THE COURSE:

To enable students to understand the fundamentals of reinforced concrete design theory for the major R. C. elements of ordinary buildings.

WEEKLY SCHEDULE AND PRE-STUDY PAGES

Week	Topics
1	Chapter A: Introduction & Material Properties of Concrete
2	Chapter A: Introduction & Material Properties of Concrete
3	Chapter B: Flexural Analysis of Beams
4	Chapter C: Strength Analysis of Beams According to ACI Code
5	Chapter C: Strength Analysis of Beams According to ACI Code
6	Chapter D: Design of Rectangular Beams
7	Chapter D: Design of Rectangular Beams
8	Midterm Week
9	Chapter E: Analysis and Design of T, L Beams
10	Chapter E: Analysis and Design of T, L Beams
11	Chapter F: Bond and Development Length
12	Chapter F: Bond and Development Length
13	Chapter G: Shear and Diagonal Tension
14	Chapter G: Shear and Diagonal Tension

- **TEXTBOOK:** Jack McCormac, Russell Brown, “Design of Reinforced Concrete”, 10th Edition, John Wiley & Sons, 2015.

REFERENCE BOOKS

- **James K. Wight, F.E. Richart, Jr., James G. Macgregor, “Reinforced Concrete, Mechanics and Design”, 6th Edition, Pearson, 2012.**

- **A.H. Nilson, D. Darwin, C.W. Dolan, “Design of Concrete Structures”, 14th Ed McGraw-Hill, 2010.**
- **W.H. Mosley, R. Hulse and J.H Bungey, “Reinforced Concrete Design to Eurocode 2”, 7th Edition, Palgrave Macmillan, 2012.**
- ACI 318-14, “Building Code Requirements for Structural Concrete and Commentary”, American Concrete Institute, 2014.
- TS 500, “Requirements for Design and Construction of Reinforced Concrete Structures”, Turkish Standards, 2000.

EN 1992-1-1: 2004 (E), “Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings”, European Standard, CEN, 2004.

EVALUATION SYSTEM:		
IN-TERM STUDIES	QUANTITY	PERCENTAGE (%)
Midterm Exam	1	30
Homework	4	20
Laboratory works	0	0
Quiz	0	0
Final Exam	1	50
TOTAL	6	100
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	5	50
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	50
TOTAL	6	100

COURSE CATEGORY:	PERCENTAGE (%)
Mathematics and Basic Sciences	20%
Engineering	40%
Engineering Design	40%
Social Sciences	0

TABLE OF ECTS / WORKLOAD:			
Activities	QUANTITY	Duration (Hour)	Total Workload
Course Duration	13	4	52
Hours for off-the-classroom study (Pre-study, practice)	14	5	70
Laboratory works	0	0	0
Mid-term	1	2	2
Final examination	1	2	2
Homework	4	2	8
Quiz	0	0	0
Total Work Load			134

Total Work Load / 30			4.5
ECTS Credit of the Course			5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
LO1	0	3	3	2	3	0	0	0	0	0	0
LO2	0	3	3	1	3	0	0	0	0	0	0
LO3	0	3	3	1	3	0	0	0	0	0	0
LO4	0	3	3	2	3	0	0	0	0	0	0
PO: Program Outcomes LO: Learning Outcomes Values: 0: None 1: Low 2: Medium 3: High											

INSTRUCTOR(S):	Assoc. Prof. Dr. Amjad Khabaz
FORM PREPARATION DATE:	22.05.2019

LEARNING OUTCOMES OF THE COURSE:	PROGRAM OUTCOMES:
<p>LO1: To understand different elements of R. C. in buildings (Excluding high-rise buildings)</p> <p>LO2: To determine the different loads on each element and design it</p> <p>LO3: To Select appropriate methods of analysis studied in the theory of structures relevant to reinforced concrete buildings</p> <p>LO4: To choose appropriate material properties studied in the Strength of Materials course and relevant to reinforced concrete buildings</p>	<p>PO1: Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems.</p> <p>PO2: Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.</p> <p>PO3: Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.</p> <p>PO4: Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively.</p> <p>PO5: Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.</p> <p>PO6: Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.</p> <p>PO7: Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.</p> <p>PO8: Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.</p>

	<p>PO9: Consciousness to behave according to ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice.</p> <p>PO10: Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development.</p> <p>PO11: Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.</p>
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