KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

Reinforced Concrete II Syllabus			
Course Title	**Reinforced Concrete II**		
Course Code	**CVE 4366**	**No. of Credits**	**3 CH**
Department	**Civil Engineering**	**Faculty**	**Engineering**
Pre-requisites Course Code	**Reinforced Concrete I (CVE 3365)**	**Co-requisites Course Code**	
Course Coordinator(s)	**Dr. Sabah Saadi Fayaed**		
Email	**sabah.saadi@komar.edu.iq**	**IP No.**	**238**
Other Course Teacher(s)/Tutor(s)	**Non**		
Learning Hours	**Section 1: Tuesday and Thursday (10:00am - 11:30am)** **Section 2: Tuesday and Thursday (4:00pm- 5:30pm)**		
Contact Hours	**Tuesday and Thursday (12:00pm- 4:00pm)**		
Course Type	**Departmental Requirement**		
Offer in Academic Year	**Spring 2016**		

COURSE DESCRIPTION

This course provides the fundamentals to the analysis and design procedures of reinforced concrete structures. Various topics were described like design of short columns subject to axial load and bending, footings, retaining walls, torsion, two-way slabs, walls and prestressed concrete. The style of this syllabus is adopted from Iowa University.

COURSE OBJECTIVES

In this course the students will learn the fundamentals of design of reinforced concrete structures, by the end of the course they will be able to analyze frame structures and design the components: footings, retaining walls, two-way slabs and columns. This course will provide background in the use of current ACI building codes (318-11), specifications, and recommendations.

COURSE LEARNING OUTCOME

After participating in the course, students would be able to:

1. Understand the fundamentals of reinforced concrete structures **(ABET Outcome A)**
2. Choose proper dead, live and other structural loads **(ABET Outcome E)**
3. Analyze, design and detail short reinforced concrete columns for axial load and bending. **(ABET Outcome E &C)**
4. Analyze and design reinforced concrete footings, two way slabs and retaining wall for flexure, shear and axial loads using ACI standard (ACI 318-11) **(ABET Outcome E&C)**
5. Apply the prestressed theory for concrete structure. **(ABET Outcome E)**
6. Determine the torsion reinforcement for concrete structures. **(ABET Outcome E)**

Grading Scale:

Points	Percentage Scores
A	95-100
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	75-79
C	70-74
C-	65-69
D+	60-64
D	55-59
D-	50-54
F	0-49
W	Withdrawal
I	Incomplete

Note: The minimum passing grade to pass this course is C-which is equivalent to 65%.

COURSE CONTENT

Course Topics Include:

Chapter 1: Introduction to Columns
Chapter 2: Design of Short Columns Subject to Axial Load and Bending
Chapter 3: Footings
Chapter 4: Retaining Walls
Chapter 5: Torsion
Chapter 6: Two-Way Slabs, Direct Design Method
Chapter 7: Walls
Chapter 8: Prestressed Concrete

COURSE TEACHING AND LEARNING ACTIVITIES

Course Teaching and Learning Activities:

1. Interactive class discussion
2. Hands- on Exercises
3. Home work
4. Tests and Quizzes

COURSE ASSESSMENT Tools

Assessment Tool	Description	Weight
Quizzes (5)	Quizzes are scheduled as shown in the semester schedule.	**15 %**
Mid-term	The mid-term will be conducted after week 7 of the semester.	**25 %**
Homework (2)	The H.W will be conducted during the semester.	**5 %**
Contribution	Students will be evaluated by the instructor based on their participation in the class, commitment, pop quizzes and other activities.	**5 %**
Test	The test will be conducted after week 12 of the semester.	**20 %**
Final Exam	The final exam will be conducted in week 16 of the semester	**30 %**

ESSENTIAL READINGS: (Journals, textbooks, website addresses etc.)

Textbooks:

Designed of Reinforced Concrete, 9 th edition, (2014), Jack C. McCormac and Russell H. Brown. Wiley, ISBN: 978-1-118-12984-5.

References:

1- Reinforced Concrete: Mechanics and Design", 6th Edition, (2011), Wight and MacGregor.

2- Reinforced Concrete Design, 7th Edition, (2007), C-K. Wang, C.G. Salmon, J.A. Pincheira ,Wiley Publishers, ISBN: 0-471-26286-2

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

Attendance Policy:

Students are expected to attend each class for the entire semester. Students are responsible for material present in lectures. Only students with official KUST absence, family crises, and illness are excused from class. Three occasions of lateness count as one absence. The student who misses 10 percent of the classes will be placed on probation.

Make up Policy:

Since all examination are announced in advance, zero grade will be given to any missed examination unless a student's has an acceptable reason, such as illness, for not being able to take the examination during all those days when the examination was announced.

Academic Dishonesty:

Any type of dishonesty (Plagiarism, Copying another's test or home-work, etc) will Not be tolerated. Students found guilty of any type of academic dishonesty are subject to failure in this course, plus further punishment by the University Consul.

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Course calendar: Please check the academic calendar for spring 2016

Week	Beg/End Dates	Topics (Chapters)	CLO	Course Assignments per chapt
1	**(28-2 to 3-3) / 2016**	**Chapter 1: Introduction to Columns** • Types of Columns • Axial Load Capacity of Columns • Failure of Tied and Spiral Columns • Code Requirements for Cast-in-Place Columns • Design Formulas	**1 & 3**	
2	**(6-3 to 10-3) / 2016**	**Chapter 2: Design of Short Columns Subject to Axial Load and Bending** • Axial Load and Bending • The Plastic Centroid • Development of Interaction Diagrams • Use of Interaction Diagrams	**1 & 3**	
3	**(13-3 to 17-3) / 2016**	**Chapter 2: Continued** • Code Modifications of Column Interaction Diagrams • Design and Analysis of Eccentrically Loaded Columns Using Interaction Diagrams • Shear in Columns • Biaxial Bending • Design of Biaxially Loaded Columns	**1 & 3**	
	(20-3 to 24-3) / 2016	**Nawroz Holiday**		
4	**(27-3 to 31-3) / 2016**	**Chapter 3: Footings** • Types of Footings • Actual Soil Pressures • Allowable Soil Pressures • Design of Wall Footings • Design of Square Isolated Footings	**4**	**Quiz 1** (Ch.1 and Ch.2)
5	**(3-4 to 7-4) / 2016**	**Chapter 3: Continued** • Footings Supporting Round or Regular Polygon-Shaped Columns • Load Transfer from Columns to Footings • Rectangular Isolated Footings • Combined Footings	**4**	

6	**(10-4 to 14-4) / 2016**	**Chapter 4: Retaining Walls** • Types of Retaining Walls • Drainage • Failures of Retaining Walls • Lateral Pressure on Retaining Walls • Footing Soil Pressures	**4**	**Quiz 2** (Ch.3) **Submitting "H.W1"**
7	**(17-4 to 21-4) / 2016**	**Chapter 4: Continued** • Design of Semigravity Retaining Walls • Effect of Surcharge • Estimating the Sizes of Cantilever Retaining Walls • Design Procedure for Cantilever Retaining Walls	**4**	
	(24-4 to 28-4) / 2016	**Mid-term**		(Ch.1, Ch.2, Ch.3 and Ch.4)
8	**(1-5 to 5-5) / 2016**	**Chapter 5: Torsion** • Torsional Reinforcing • Torsional Moments that Have to Be Considered in Design • Torsional Stresses • When Torsional Reinforcing Is Required by the ACI	**6**	
9	**(8-5 to 12-5) / 2016**	**Chapter 5: Continued** • Torsional Moment Strength • Design of Torsional Reinforcing • Additional ACI Requirements	**6**	
10	**(15-5 to 19-5) / 2016**	**Chapter 6: Two-Way Slabs, Direct Design Method** • Analysis of Two-Way Slabs • Design of Two-Way Slabs by the ACI Code • Column and Middle Strips • Shear Resistance of Slabs • Depth Limitations and Stiffness Requirements	**2 & 4**	**Quiz 3** (Ch.5)
11	**(22-5 to 26-5) / 2016**	**Chapter 6: Continued** • Limitations of Direct Design Method • Distribution of Moments in Slabs • Design of an Interior Flat Plate • Placing of Live Loads	**2 & 4**	**Submitting "H.W2"**

		• Analysis of Two-Way Slabs with Beams		
12	**(29-5 to 2-6) / 2016**	**Chapter 7: Walls** • Non–Load-Bearing Walls • Load-Bearing Concrete Walls-Empirical Design Method • Load-Bearing Concrete Walls-Rational Design • Shear Walls • ACI Provisions for Shear Walls	**1 & 4**	**Quiz 4** (Ch.6)
		TEST (Ch. 5, Ch.6 and Ch.7)		
13	**(5-6 to 9-6) / 2016**	**Chapter 8: Prestressed Concrete** • Advantages and Disadvantages of Prestressed Concrete • Pretensioning and Posttensioning • Materials Used for Prestressed Concrete • Stress Calculations	**5**	
14	**(12-6 to 16-6) / 2016**	**Chapter 8: Continued** • Shapes of Prestressed Sections • Prestress Losses • Ultimate Strength of Prestressed Sections • Deflections	**5**	**Quiz 5** (Ch.8)
15	**(19-6 to 23-6) / 2016**	**Review Week for Academic Courses**		
16	**(26-6 to 30-6) / 2016**	**Final Examination for Academic Courses**		**All the Chapters**