

**TISHK INTERNATIONAL UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**Department of CIVIL ENGINEERING,**  
**2020-2021 Spring**  
**Course Information for CE 326 REINFORCED CONCRETE II**

<b>Course Name:</b>	REINFORCED CONCRETE II				
<b>Code</b>	<b>Regular Semester</b>	<b>Theoretical</b>	<b>Practical</b>	<b>Credits</b>	<b>ECTS</b>
CE 326	6	4	-	4	
<b>Name of Lecturer(s)- Academic Title:</b>	Beyan Ubeyd Salim - Prof.				
<b>Teaching Assistant:</b>	NA				
<b>Course Language:</b>	English				
<b>Course Type:</b>	Main				
<b>Office Hours</b>	1 Hour				
<b>Contact Email:</b>	bayan.salim@tiu.edu.iq Tel:07507267240				
<b>Teacher's academic profile:</b>	Professor of civil engineering Faculty of Engineering Ishik University				
<b>Course Objectives:</b>	This course is a continuation to CE313 course. The main objectives will be on the serviceability design criteria of reinforced concrete members, approximate analysis of continuous r. c. members, analysis and design of one way slabs, analysis and design of columns (short and slender), with 20% PBL approach of learning				
<b>Course Description (Course overview):</b>	Introduction, course outline, Serviceability Introduction, Cracking of Flexural Members, ACI Code Provisions for Crack Control, Deflection Control, ACI Code Provisions for Deflection Control, Design of One-way slabs Types of Slabs, Design of One-Way Slabs, Modeling, Minimum Thickness, Reinforcement Ratio, Shrinkage and Temperature Reinforcement, Shear, Short columns, Introduction, Behavior of Short, Axially Loaded Compression Members, Lateral Ties and Spirals, Compression plus Bending of Rectangular Columns, Interaction Diagrams, Circular Columns, ACI Code Provisions for Column Design, Distributed Reinforcement, Unsymmetrical Reinforcement, Design Aids, Biaxial Bending, Reciprocal Load Method, Slender columns, Introduction, Braced and Unbraced Frames, Compression plus Bending, ACI Criteria of Neglecting of Slenderness Effects, Moment Magnifier Method (MMM), MMM for Sway Frames, MMM for Non-Sway Frames, RC Walls, Introduction, Design of Walls, Minimum Thickness, Reinforcement Ratio, Shear.				

**COURSE CONTENT**

Week	Hour	Date	Topic
1	4	31/1-4/2/2021	Syllabus presentation, references, reading assignments, and scope of the course
2	4	7-11/2/2021	Serviceability of r.c. flexural members
3	4	14-18/2/2021	deflection control, design examples
4	4	21-25/2/2021	crack control, design examples
5	4	28/2-4/3/2021	Approximate analysis of continuous r.c. members
6	4	7-11/3/2021	Types of slab systems
7	4	28/3-1/4/2021	One way slabs
8	4	4-8/4/2021	design examples
9	4	11-15/4/2021	Midterm Exam
10	4	18-22/4/2021	Midterm Exam
11	4	25-29/4/2021	Interaction diagrams
12	4	2-6/5/2021	design examples

13	4	9-13/5/2021	biaxial bending; design examples
14	4	16-20/5/2021	slender columns
15	4	23-27/5/2021	braced and unbraced columns
16	4	30/5-3/6/2021	design examples
17	4	6-10/6/2021	Final Exam
18	4	13-17/6/2021	Final Exam

### COURSE/STUDENT LEARNING OUTCOMES

- 1 ability to control deflections and cracking of r.c. flexural members
- 2 ability to analyse and design continuous one way slabs
- 3 ability to analyse and design short r.c. columns
- 4 ability to analyse and design slender r.c. columns
- 5 An ability to work in teams to solve an integrated design problem ; PBL method

### COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES

(Blank : no contribution, I: Introduction, P: Proficient, A: Advanced )

#### Program Learning Outcomes

	Cont.
1 Apply principles of mathematics, science, and engineering	P
2 Design and conduct experiments, as well as analyze and interpret data accurately.	I
3 Design an engineering system, component, or process to meet desired industrial needs.	P
4 Identify, formulate and solve complex engineering problems	P
5 Apply, in design and construction, the most modern design codes, standards and specifications such as; AISC, ACI, ASCE 7, IBC, etc.	P
6 Use the techniques, skills, and modern engineering tools, such as surveying instruments, and designing software that are necessary for engineering practices.	
7 Apply knowledge and skills in construction project management and recognition of international standards and methodologies	
8 Manage to work with multi-disciplinary teams and communicate effectively.	
9 Identify the moral values that ought to guide the Civil Engineering profession and resolve the moral issues in the profession.	
10 Apply the principles of sustainable development in their professional duties which go in line with the paramount safety, health and welfare of the public.	
11 Analyze the impact of engineering solutions in a global and social context	
12 Identify the need and have the ability to engage in lifelong learning and knowledge of contemporary issues.	

<b>Prerequisites (Course Reading List and References):</b>	RC I course (CE313) Mechanics of Materials Structural Analysis Concrete Technology
<b>Student's obligation (Special Requirements):</b>	Attendance, reading assignments, quizzes, midterm and final exams, project and presentation
<b>Course Book/Textbook:</b>	A. H. Nilson, D. Darwin, and C. W. Dolan, Design of Concrete Structures, 14th ed. 2016 ACI 318 - 2019
<b>Other Course Materials/References:</b>	1. J. K. Wight and J. G. MacGregore, Reinforced Concrete, Mechanics and Design, 6th ed. 2012. 2. MacCormac, Design of reinforced concrete
<b>Teaching Methods (Forms of Teaching):</b>	Lectures, Presentation, Project, Assignments

### COURSE EVALUATION CRITERIA

Method	Quantity	Percentage (%)
Participation	1	5
Quiz	1	15
Homework	1	10
Midterm Exam(s)	1	30
Final Exam	1	40

<b>Total</b>		<b>100</b>	
<b>Examinations:</b> Essay Questions, True-False, Multiple Choices			
<b>Extra Notes:</b>			
<b>ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD</b>			
<b>Activities</b>	<b>Quantity</b>	<b>Workload Hours for 1 quantity*</b>	<b>Total Workload</b>
Theoretical Hours	18	4	72
Practical Hours	18	0	0
Final Exam	1	32	32
Participation	1	4	4
Quiz	1	24	24
Homework	1		0
Midterm Exam(s)	1		0
<b>Total Workload</b>			<b>132</b>
<b>ECTS Credit (Total workload/25)</b>			<b>5.28</b>

**Peer review**

Signature:

Name:

Lecturer

Signature:

Name:

Head of Department

Signature:

Name:

Dean