

1. Course Name:	
Reinforced Concrete Design IV	
2. Course Code:	
CIV42101	
3. Semester / Year:	
2nd / fourth	
4. Description Preparation Date:	
8-12-2025	
5. Available Attendance Forms:	
Weekly (Theory: 3 hours, Tutorial: 1 hours)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Theory: 45 Hours Tutorial: 15 hours Total: 60 hours Total Units: 5	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Maloof Mahmood Email: maloof.mahmoodi@muc.edu.iq	
8. Course Objectives	
Course Objectives	1. Providing the student with the necessary skills and mechanisms to deal with the latest developments in scientific and technical progress in their field of specialization. 2. Special care for outstanding students and enabling them to put forward their ideas. 3. Providing the student with high skill and the ability to solve problems and teamwork. 4. Instilling the spirit of diligence and perseverance and encouraging them to create and innovate.
9. Teaching and Learning Strategies	
Strategy	1. Introduce students to definition of Reinforced Concrete IV. 2. Self-regulated learning (i.e., planning, monitoring and evaluating one's own learning process in the classwork / Class team work). 3. Practice testing (short question answers and exams). 4. Self-explanation (i.e., explaining to oneself how new information is related to old information or explain steps taken when solving a problem or a task).
1. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understanding of the concepts of prestressed concrete	Classifications and types of prestressed concrete.	Theoretical	Homework
2	4	Further understanding of the concepts of prestressed concrete	General principles of prestressed concrete of beams.	Theoretical	Homework
3	4	Understanding of stages of prestressed concrete.	Stages of prestressed concrete with equations for initial stage and service stage.	Theoretical	Quiz
4	4	Problems in prestressed beams	Solving problems for prestressed beams at initial stage and service stage	Theoretical	Homework
5	4	Understanding the principle of loss of prestress	Elastic shortening of concrete in pre tensioned beams and posttensioned beams	Theoretical	Exam
6	4	Introduction to flexural analysis of prestressed beams	Permissible stresses in prestressed tendons of prestressed beams.	Theoretical	Homework
7	4	Posttensioned beams with double –T section	Analysis and design of posttensioned double-T beams.	Theoretical	Quiz
8	4	Pre-tensioned beams with double-T sections	Analysis and design of pre-tensioned beams of double-T sections.	Theoretical	Homework
9	4	Understanding the method of analysis of beams based on allowable concrete stress.	Analysis of pre stressed T-beam and determining the maximum loading based on allowable concrete stress.	Theoretical	Homework
10	4	Understanding the maximum service load.	Analysis of pre-stressed rectangular box and determining the maximum service load based on force and service stresses.	Theoretical	Exam
11	4	Learning the flexural design of prestressed beams	Flexural design of pre-stressed beams	Theoretical	Homework

			based on allowable concrete stress.		
12	4	Introducing formulas for the design of pre-stressed beams.	Using design formulas for prestressed beams with variable eccentricity.	Theoretical	Homework
13	4	Introduction of Yield Line Theory for slabs.	Analysis of simply supported slab and fixed end slab by yield line theory	Theoretical	Homework
14	4	Learning virtual work method for analysis of slab by yield line method	Analysis of slab using virtual work method by yield line method.	Theoretical	Quiz
15	4	Preparatory work	Preparatory week before the final exam	Theoretical	

2. Course Evaluation

The grade distribution is as follows:

Assessment: Formative 40 marks,

Final exam: Theory 60 marks.

3. Learning and Teaching Resources

Required textbooks (curricular books, if any)	G. Winter, Design of Concrete Structures, 9 th ed. McGraw-Hill International Book Company.
Main references (sources)	A.H. Nelson, Design of Concrete Structures, 13 th ed. McGraw-Hill International Book Company.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form (Reinforced Concrete Design IV)