

Academic Year: 2023-2024	Semester: Spring	Starting Date: 24-02-2024
Course Name	Prestress concrete	
Module Language	English	
Instructor	Prof. Dr. Omar Qarani	
Teaching Assistance(s)	None	
College/University	College of Engineering – Salahaddin University-Erbil	
Department	Civil	
Semester Duration	15 weeks	
Course Overview	<p>The course introduces students to the behavior and design of prestressed Concrete structures and provides them the background needed to design various prestressed concrete members. Course topics include an overview of prestressing technology, loss of prestress, axially loaded prestressed members, flexural and shear behavior/design of prestressed members, and deflections. At the end of the course, students are expected to have the ability to describe the expected behavior of and perform basic design procedures for typical prestressed concrete members.</p>	
Course Objectives	<p>Learn the fundamentals of prestressed concrete design and the mechanics of how prestressed materials work under applied loads. The prestressing mechanism provides strength for tensile forces when the material is in service</p>	
Course Contents	<p>Week Lecture</p> <p>1st Introduction about prestress</p> <p>2nd Prestress technique and materials</p> <p>3rd Allowable stresses in prestressed concrete</p> <p>4th Prestress losses</p> <p>5th Prestress losses</p> <p>6th Ultimate moment capacity</p> <p>7th Design of prestressed concrete girders for flexure</p> <p>8th Design of prestressed concrete girders for flexure</p> <p>9th Mid-term exam</p> <p>10th Design of prestressed concrete girders for shear</p> <p>11th Camber and deflection of prestressed girders</p> <p>12th Composite prestress girders</p>	

	<p>13th Design of prestress concrete girder bridge</p> <p>14th Seminar or report Presentation</p> <p>15th Final Exam</p>
Textbooks and References	<p>References</p> <p>1- “Prestressed Concrete Analysis and Design”, by Antoine E. Naaman, 3rd edition, 2012.</p> <p>2- “Prestressed Concrete: A Fundamental Approach”, by Edward G. Nawy, 5th edition, 2010.</p> <p>3- “Analysis and Design of Prestressed Concrete”, by DI HU, 1st edition, 2022.</p> <p>4- “Design of Prestressed Concrete Structures”, by T. Y. Lin and Ned H. Burns, 3rd edition, 1981.</p> <p>5- “Building Code Requirements for Structural Concrete (ACI M318-19), ACI.</p>
Teaching Style	3 hrs. in Class
Requirements for credit points	<p>For the award of credit points, it is necessary to pass the module exam. It contains:</p> <p>Mid-term exam, Quizzes, Assignments, report, seminar and Final examination.</p> <p>Student's attendance is required.</p>
Credit ECTS	6
Grade Distribution	<p>The following grade system is used for the evaluation of the module exam:</p> <p>The module exam is based on the summation of two categories of evaluations:</p> <p>First: (50%) of the mark is based on the academic semester effort which includes</p> <ul style="list-style-type: none"> - Midterm Exam 20%. - Quizzes and assignments 10% - Seminar 10% - Report 10% <p>Second: (50%) of the mark is based on the final examination that is comprehensive for the whole of the study materials reviewed during the academic semester.</p>
Workload	<p>Workload 10hrs/w (150hrs/s): Contact face-to-face 3hrs/w (45hrs/s) and Non-Contact Self learning 7hrs/w (105hrs/s)</p>