

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Design Of prestressed concrete		Module Delivery
Module Type	Elective		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CIV025		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGIV	Semester of Delivery	
Administering Department	CV102	College	Civil Engineering College
Module Leader	Dr. Mohammed Raji Mohammed	e-mail	moh.raji@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Mohammed Raji Mohammed	e-mail	moh.raji@uoanbar.edu.iq
Peer Reviewer Name	Name	e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. Increased knowledge of the design and construction of prestressed concrete structures. The skills necessary to analyze, design and construct of prestressed objects. The skills to identify the issues related to the design and construction of prestressed structures. <p>The goals of this course are to enable students to:</p> <ol style="list-style-type: none">2. After successfully completing this course, the student will be able to:3. Calculate prestress losses4. Design prestressed concrete beams to resist flexure5. Analyze flexural forces in prestressed concrete beams6. Design prestressed concrete beams to resist shear7. Calculate camber and deflection6. Investigate the bond of prestressing strands.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. Describe the basic properties of prestressed concrete constituents.2. Analyse the flexural behaviour of simple beams3. Calculate prestress losses for simple prestressed concrete girders4. Design prestressed concrete girders for flexure using current design procedures (ACI Standards,).5. Recognize the effects of transfer and development length on flexural and shear strengths.6. Construct moment-curvature and load-deflection curves for a prestressed concrete beam.7. Analyse and design prestressed concrete members for shear.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Chapter one</u></p> <p>Introduction: Definitions and reviews, Basic concepts of Design of Prestressed Structures</p> <p><u>Chapter Two</u></p> <p>Materials and systems for prestressing</p> <p><u>Chapter Three</u></p> <p>Partial loss of prestress</p> <p><u>Chapter Four</u></p> <p>Flexural design of prestressed concrete elements</p> <p><u>Chapter Five</u></p> <p>Shear and torsional strength design</p> <p><u>Chapter Six</u></p> <p>Indeterminate prestressed concrete structures</p> <p><u>Chapter Seven</u></p>

	Camber, deflection, and crack control Chapter Eight Prestressed Columns and Prestressed Slabs (Design charts)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>Design of Prestressed Structures module integrates science and engineering principles to design prestressed concrete members and structural systems. The application of scientific and engineering knowledge is demonstrated in solving engineering problems associated with the design of precast prestressed building members both composite and non-composite for superimposed loads, and one-way post-tensioned floor slabs systems bonded and unbonded also composite and non-composite for superimposed loads. Design of pretensioned Hollow-Core slabs, Double-Tee and I-Beam members, and one-way post-tensioned floor slabs is exercised using current building code requirements to provide experiences in realistic design practice. The following subjects are used to solve engineering problems: calculus and differential equations; use of computer tools, data manipulation, statistical analysis, numerical calculation, and reinforced concrete design principles.</p> <p>The course is developed in three modules:</p> <ol style="list-style-type: none"> 1- Fundamentals of Prestressed Concrete (this course) 2- Pretensioned Structures 3- Post-Tensioned Structure

Student Workload (SWL) الحمل الدراسي للطالب					
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً		4.0
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً		2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل		100			
Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	3, 6,10,14	LO #1, 3,5, and 7
	Assignments	2	5% (5)	2, 12	LO # 4 and 7
	Projects /				
	Report	1	5% (5)	13	LO # 2,6 and 7

Summative assessment	Midterm Exam	2 hr	20% (20)	7	LO # 1-7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Prestressed Concrete Design
Week 2	Methods of Prestressing. Forces Imposed by Prestressing (Straight, Draped and Kinked Tendon Profiles). Load Balancing. Introductory Examples. Design Requirements: Strength and Serviceability. Material Properties.
Week 3	Design for Serviceability. Design For Shear. Effect of Prestress on Shear)
Week 4	Stress limits. Serviceability criteria. Determination of prestress and eccentricity. Cable profiles
Week 5	Cracked section analysis. Effect of cracking at service loads. Short-term cracked section analysis.
Week 6	Losses
Week 7	Limit State Design. Rectangular Stress Block. Ultimate Moment Capacity. Effect of Non-Prestressed Steel
Week 8	Mid-term Exam
Week 9	Indeterminate prestressed concrete design
Week 10	Design For Shear. Effect of Prestress on Shear. Flexure-Shear
Week 11	Design of Post-Tensioned Members and Pretensioned Members
Week 12	Deflection and crack control
Week 13	. prestressed compression and tension members
Week 14	Two-way prestressed concrete floor systems
Week 15	Transfer Strength: Limit State Design
Week 16	Introduction to Prestressed Concrete

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:

Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Loo, Yew-Chaye and Chowdhury, Sanaul Huq, Reinforced and Prestressed Concrete, Analysis and Design with emphasis on application of AS3600-2009, Cambridge University Press, 2010	Yes
Recommended Texts	Gilbert and Mickleborough, The Design of Prestressed Concrete, Unwin Hyman, London, 1990. Standards Australia, Australian Standard for Concrete Structures, AS3600 Warner, RF, Foster, SJ, and Kilpatrick AE, "Reinforced Concrete Basics", Pearson, 2007 Warner, Rangan, Hall and Faulkes, Concrete Structures.	Yes
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.