جـامـعـة الـشـرقـيـة
A' SHARQIYAH UNIVERSITY

Course Descriptor

CVEN536 PRE-STRESSED CONCRETE

ACADEMIC YEAR	2018/19		
Course Code & Title	CVEN536 PRE-STRESSED CONCRETE		
Credit hours	3	**Level of study**	Undergraduate
College / Centre	Engineering		
Co-requisites		**Pre-requisites**	CVEN340

1. COURSE OUTLINE

Analysis and design of pre-stressed concrete structures in flexure, shear, torsion and deflection of pre-stressed concrete beams and slabs, and time-dependent effects such as creep and shrinkage.

2. AIMS

To provide an understanding of the fundamental concepts of pre-stressed concrete analysis and design

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes ***(Definitive)*** Upon successful completion of this course, students will be able to**:**	**Teaching and Learning methods** ***(Indicative)***	**Assessment** ***(Indicative)***
1. Understand the fundamental concepts of pre-stressed concrete analysis and design	Lecturers, Presentations	*Assignment, Midterms, and Final Exam*
2. Analyze the flexural behaviour of simple and composite pre-stressed concrete members	Lecturers, Presentations	*Assignment, Midterms, and Final Exam*
3. Analyze and design pre-stressed concrete members for flexure using current design codes	Lecturers, Presentations	*Assignment, Midterms, and Final Exam*
4. Understand the effects of transfer and development length on flexural and shear strengths	Lectures, Presentation	*Assignment, Midterms, and Final Exam*
5. Analyze and design pre-stressed concrete members for shear	Lectures, Presentation	*Assignment, Midterms, and Final Exam*

4. ASSESSMENT WEIGHTING

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Assessment	Percentage of final mark (%)
Assignments	30%
Mid term	20%
Quizzes	10%
Final Exam	40%
TOTAL	**100%**

5. ACHIEVING A PASS

Students will achieve 3 credit hours for this course by passing **ALL** of the course assessments *[Assignments, Midterm and Final examinations]* and achieving a **minimum overall score of 50%**

NB *Ensure that ALL learning outcomes are taken into account

6. COURSE CONTENT (Indicative)

LECTURE TOPIC	TIME (HOURS)
Basic concepts of pre-stressing systems: pre-tensioning vs. post-tensioning, architectural and structural precast members, and material properties	2
Basic concepts of stress analysis: initial vs. effective pre-stressing force, calculation of stresses at transfer and at service stages, location of maximum stresses in members	4
easuring Quantities	5
Allowable stresses at transfer and at service	4
Ultimate flexural strength and reinforcement requirements	5
Shear strength and minimum reinforcement requirements	4
Pre-stress losses	1
Composite construction and implication of construction sequence on stresses Design of the shear interface in composite members	4
Design of the shear interface in composite members	5
Camber and Deflection	4
Development Length and anchorage zones	1
Design and analysis of pre-stressed concrete columns	6

TOTAL HOURS	**45**
Plus **RECOMMENDED INDEPENDENT STUDY HOURS**	
TOTAL COURSE HOURS	**135**

7. RECOMMENDED READING

Core text/s:

1. Nawy, E. G. (2010). *Prestressed Concrete*, 5th Ed, Prentice Hall, Upper Saddle River, NJ.

2. American Concrete Institute (ACI) (2008). *ACI 318-08 Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary (ACI 318R-08),* American Concrete Institute, Farmington Hills, MI. (ISBN 0-87031-171-9)..

Library + online resources:

NPTEL website (nptel.ac.in) for engineering
books ICE virtual library (www.ice.org.uk)