Module Descriptor Form

Civil and Environmental Engineering

CL976 - Pre-Stressed Concrete, Composite Materials And Structural Stability

Module Code	CL976	**Module Title**	Pre-Stressed Concrete, Composite Materials And Structural Stability				
Module Registrar	Tubaldi, Dr Enrico						
Other Staff Involved							
Credit Weighting	10	**Semester**	2	**Elective**	No	**Academic Level**	5
Pre-requisites							
Required for							

Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
12	10	10	0	68	100

Educational Aim

This module aims to:

This module aims to introduce the students to the analysis and design of prestressed concrete and steel-concrete composite members commonly adopted in the construction industry.

Syllabus

This module will teach the following:

The module will include the following:

Prestressed Concrete:
Principles of prestressed concrete structures
Losses of prestressing force
Serviceability Limit State (SLS) analysis of sections
SLS design of concrete section
SLS design of prestress force
Ultimate Limit State (ULS) analysis of sections
Structural design detail
Shear design

Composite Construction
Principle of composite construction
Analysis of composite members

Most of the classes are delivered by solving a tutorial that reflects a real-world example.

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Learning Outcomes

On Completion of the module, the student is expected to be able to:

LO: 1	LO1 Understand the structural behaviour of steel prestressed concrete and concrete-steel composite members.
LO: 2	LO2 Perform structural design of prestressed concrete and concrete-steel composite members.
LO: 3	LO3 Appreciate the benefits of using prestressed concrete and concrete-steel composite construction in terms of reduction of carbon embodied compared to ordinary concrete construction

(UK SPEC suggests no more than 4 learning outcomes per module. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the programme specifications.)

Assessment of Learning Outcomes - Criteria

Learning Outcome: **1**

	Criteria
1	C1 use the concepts of engineering mechanics, stress, strain and strength to determine the response of members under practical loading.
2	C2 assess the serviceability of designed elements under limit state.

Learning Outcome: **2**

	Criteria
1	C1 use the principles of prestressed concrete and steel-concrete composites to check the design adequacy of members under practical loading.
2	C2 apply current code of practice procedures to the design and verification of prestressed concrete and composite elements.

Learning Outcome: **3**

	Criteria
1	C1 apply current code of practice procedures to the design of structural details of ordinary concrete, prestressed concrete, and composite elements.
2	C2 estimate the carbon embodied in the different elements.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

To Pass the module, students need to gain a summative mark of: 50%

Description	Semester	Start Week	Duration	Weight	Submission Week	Linked Criteria
Coursework	2	4		30%	7	LO 1: C1, C2 LO 2: C1, C2 LO 3: C1, C2
Final exam. Open Book: Any written note	2		2.00	70%	E	LO 1: C1, C2 LO 2: C1, C2 LO 3: C1, C2

Principles of Assessment Feedback

These are incorporated in this module as follows:

1. Marking criteria are outlined clearly in the assignment handout and multiple opportunities for questions are available, either in class or through electronic correspondence. Each marking sheet is taken directly from this handout.

2. Tutorial questions are provided to support student self-assessment and reflection.

3. Departmental policy is to carry out mid-term class assessments and provide feedback to students.

Additional Information

Resit Procedure

2 hr examination in August diet

Recommended Reading

***Purchase recommended **Highly recommended reading *For reference

**Hurst, M.K., Prestressed concrete design, Taylor & Francis, 1998.
** Gilbert, R.I., Mickleborough, N.C., Ranzi, G. Design of prestressed concrete to Eurocode 2, CRC Press, 2017.
** Raju, N. K., Prestressed concrete. Tata McGraw-Hill Education, 2006.
** Johnson, R. P., Buckby, R. J., Composite structures of steel and concrete, Collins, 1996.

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Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3		
4		
5		
6		
7		Submission 30%
8		
9		
10		
11		
E		Examination 70%

Date of Last Modification

06-11-2025