Module Descriptor Form

Civil and Environmental Engineering

CL114 - Civil Engineering Design Projects

Module Code	CL114	**Module Title**	Civil Engineering Design Projects				
Module Registrar	Amabile, Dr Alessia						
Other Staff Involved	Dr James M Leak (Lecturer), Mr Neil A Cochrane (Lecturer)						
Credit Weighting	20	**Semester**	1/2	**Elective**	No	**Academic Level**	1
Pre-requisites							
Required for							

Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
16	10	24	12	75	137

Educational Aim

This module aims to:

This class provides an introduction to the design process for civil and structural engineering projects. It includes an introduction to engineering drawing and Autocad in the first semester . In the second semester, students apply the skills and knowledge learned in this class and Engineering Mechanics to design, construct and test a model of a bridge.

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Syllabus

This module will teach the following:

Semester 1
Introduction to the design process, design constraints and how structures stand up.
Case studies of existing buildings and bridges.
2D engineering drawings and an introduction to AutoCAD.
Small group presentations at set times throughout the week.

Semester 2
Analyse and develop a project brief
Carry out precedent studies of existing structures
Conceptual structural design
Hand analysis for statically determinate structures
Outline technical design of structural elements
Prepare a detailed structural design for a bridge model including making and testing of components, joints and prototypes, analysis and
design calculations, plus technical drawings from which the bridge can be constructed.
Construct and test a model of the bridge
Learning from failure – analysis of the failure mode of the model

Learning Outcomes

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

LO: 1	Carry out a precedent study of an existing structure
LO: 2	Prepare simple 2D engineering drawings using AutoCAD
LO: 3	Carry out an analysis of a design brief
LO: 4	Prepare conceptual designs and a detailed design for a simple structure

(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.)

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Assessment of Learning Outcomes - Criteria

Learning Outcome: **1**

	Criteria
1	Appreciation of the loadings on a structure
2	Understanding of load paths in statically determinate structures
3	Understanding of different types of forces in structural elements and associated types of elements

Learning Outcome: **2**

	Criteria
1	Knowledge of standard rules and conventions used to prepare civil and structural engineering drawings
2	Ability at using CAD software

Learning Outcome: **3**

	Criteria
1	Ability to identify design constraints applicable to a project
2	Ability to identify options for design constraints
3	Ability to identify interactions and priorities between design constraints

Learning Outcome: **4**

	Criteria
1	Ability to develop the brief
2	Assessment of the forces and stresses in individual elements by hand analysis
3	Understanding of structural behaviour and optimisation
4	Ability to carry out detailed technical design of elements in a simple structure

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

To Pass the module, students need to gain a summative mark of: 40%

Description	Semester	Start Week	Duration	Weight	Submission Week	Linked Criteria
DP11: Design Workshop	1			5%	5	LO 1: C1, C2, C3 LO 3: C1, C2, C3 LO 4: C1
DP12: Case study group abstract	1	1		5%	6	LO 1: C1, C2, C3
DP13: AutoCAD Assignment 1	1	5		5%	8	LO 2: C1, C2
DP15: Case study group presentation	1			15%	11	LO 1: C1, C2, C3 LO 3: C1, C2, C3
DP14: AutoCAD Assignment 2	1	5		20%	11	LO 2: C1, C2
DP16: Bridge Project – design report	2	1		30%	7	LO 3: C1, C2, C3 LO 4: C1, C2, C3
DP18: Building and Testing Report	2	7		10%	9	LO 2: C1, C2 LO 3: C1, C2, C3 LO 4: C1, C2, C3, C4
DP19: Bridge Project group presentation	2			10%	11	LO 4: C1, C2, C3, C4

Principles of Assessment Feedback

This module aims to promote effective learning by assessing students through increasingly complex tasks which are evaluated in line with current academic policies. Timely, actionable feedback will be provided to students within 15 working days of the submission deadline. Where possible, work will be assessed anonymously. Students will have the opportunity to get interim feedback or feedforward guidance in advance of submission.

Additional Information

Resit Procedure

Students must gain a summative mark of 40% to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of coursework.

No marks from any previous attempts will be transferred to a new re-sit attempt.

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Recommended Reading

978-0429217234 – Narayanan, R. S. (2017) Introduction to design for civil engineers
978-0080942933 – Cobb, F. (2009) Structural engineer's pocket book
978-1315683775 – Slade, R. (2016) Sketching for engineers and architects
978-0415336239 – Millais, M. (2005) Building structures: from concepts to design
978-1317312161 – Millais, M. (2017) Building structures: understanding the basics
978-0080519302 – Hunt, T. (2003) Tony's Hunt's structures notebook
0306812835 – Gordon, J.E. (2003) Structures: or why things don't fall down
978-0141978215 – Calder, B. (2021) Architecture from prehistory to climate emergency
978-3791347318 – Arup, O.N. (2012) Ove Arup: philosophy of design – essays
978-0727734877 – Paxton, R. (2007) Scotland: Lowlands and Borders
978-0727738028 – * Parke, G.A.R.; Hewson, N.R.; Ryall, M.J. (2008) ICE manual of bridge engineering

Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3		
4		
5	In Person 5%	
6	Submission 5%	
7		Submission 30%
8	Submission 5%	
9		Lab 0%, Submission 10%
10		
11	Submission 20%, In Person 15%	In Person 10%
E		

Date of Last Modification

08-09-2025