

Module Title:	Structural Design I	
Language of Instruction:	English	
Credits:	5	
NFQ Level:	8	
Module Delivered In	2 programme(s)	
Teaching & Learning Strategies:	Lectures Project work Private study	
Module Aim:	The aims of this module are: 1. to extend the learner's knowledge of the application of structural loads; 2. to enable the learner's to design reinforced elements; 3. to enable the learner's to design steel beams, columns and trusses; 4. to enable the learner's to use computer applications in structural design.	
Learning Outcomes		
On successful completion of this module the learner should be able to:		
LO1	to apply loads to structural elements in accordance with the relevant National and European design standards,	
LO2	to describe and design structural elements in steelwork in accordance with the relevant National and European design standards.	
LO3	to describe and design structural elements in reinforced concrete in accordance with the relevant National and European design standards.	
LO4	to use appropriate software tools to analysis and design structural elements to the relevant National and European design standards.	
Pre-requisite learning		
Module Recommendations		
This is prior learning (or a practical skill) that is recommended before enrolment in this module.		
6567	DSGN H4501	Structural Design I
Incompatible Modules		
These are modules which have learning outcomes that are too similar to the learning outcomes of this module.		
No incompatible modules listed		
Co-requisite Modules		
No Co-requisite modules listed		
Requirements		
This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.		
No requirements listed		

Module Content & Assessment

Indicative Content

Introduction to Structural Design

a) Irish standards b) British standards c) European standards d) Ultimate limit state e) Serviceability limit state f) Characteristic loads g) Design loads h) Load combinations i) Design methods

Design of Reinforced Concrete Elements

a) Singly reinforced rectangular section b) Doubly reinforced rectangular section c) Flanged sections d) Minimum and maximum areas of reinforcement e) Cover requirements for durability and fire f) Analysis of continuous members g) Moments redistribution h) Tension reinforcement and curtailment i) Shear reinforcement j) Deflection k) One way and two way spanning reinforced concrete slabs l) Reinforced concrete columns

Design of Structural Steelwork Elements

a) Types of steel structures b) Material properties c) Steel sections, dimensions and properties d) Classification of sections e) Moment and shear resistance f) Deflection g) Design of Restrained and unrestrained beams h) Design of tension members i) Design of compression members j) Use and types of steel trusses k) Design of steel trusses l) Simple connections in structural steelwork m) Beam to column connections n) Beam to beam connections

Use of Computers in Structural Design

a) Computer packages available b) Reinforced concrete design using a computer package c) Structural steel design using a computer package

Assessment Breakdown	%
Project	40.00%
End of Module Formal Examination	60.00%

No Continuous Assessment

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Steelwork Design Projects	1,2,4	20.00	n/a
Project	Reinforced Concrete Design Projects	1,3,4	20.00	n/a

No Practical

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Final Exam	1,2,3	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	30 Weeks per Stage	2.00
Estimated Learner Hours	30 Weeks per Stage	2.00
Total Hours		120.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_CMHCE_B	Bachelor of Engineering (Honours) in Civil Engineering - Ab Initio	5	Mandatory
CW_CMCEN_B	Bachelor of Engineering (Honours) in Civil Engineering - Add On	1	Mandatory