Module Descriptor Form

Civil and Environmental Engineering

CL418 - Structural Engineering 2

Module Code	CL418	**Module Title**	Structural Engineering 2				
Module Registrar	Valentine, Mrs Viola						
Other Staff Involved							
Credit Weighting	20	**Semester**	1/2	**Elective**	Yes	**Academic Level**	4
Pre-requisites	CL313						
Required for	CL528						

Module Format and Delivery (hours):

Lectures	Tutorials	Assignments	Labs	Private Study	Total
26	21	90	0	63	200

Educational Aim

This module aims to:

introduce students to the conceptual and detailed design of whole structures. Students work in small groups to prepare the conceptual design of a multi storey building, followed by preparation of an individual coursework for the detailed design of typical elements including analysis and technical design.

Syllabus

This module will teach the following:

Semester 1 (exchange CL449)

- The design process
- Preparation of a requirements statement
- Conceptual structural design
- Loadings and Eurocode load combinations
- Preliminary sizing of structural elements
- Yield line analysis – two-way spanning slabs
- Embodied carbon assessment of the primary structural frame
- Structural stability systems
- Option analysis (optioneering)

Semester 2

- Sub-frame analysis
- Overall stability of structures
- Reinforced concrete column design
- Optimisation of reinforced concrete structural elements

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Learning Outcomes

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

LO: 1	Understand design processes and methodologies.
LO: 2	Apply quantitative methods and use computer software in order to solve structural engineering problems.
LO: 3	Understand and apply appropriate codes of practice and industry standards.
LO: 4	Work in a group on a complex design brief.

(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	Appreciation of the IStructE Design Process and RIBA Plan of Work
2	Ability to prepare a requirements statement
3	Knowledge of methods for option analysis

Learning Outcome: **2**

	Criteria
1	Detailed understanding of structural behaviour and loading application and transfer in structures
2	Ability to carry out initial sizing of structural elements for conceptual design purposes
3	Ability to carry out quantitative assessment of embodied carbon for the structural primary frame
4	Ability to carry out structural analysis using computer software and verify the results

Learning Outcome: **3**

	Criteria
1	Ability to calculate loadings onto structures in accordance with the Eurocodes or British Standards
2	Ability to carry out technical design of structural elements in accordance with the Eurocodes
3	Ability to prepare conceptual and detailed structural design reports including text, sketches, calculations and drawings

Learning Outcome: **4**

	Criteria
1	Ability to further develop a complex design brief
2	Ability to work on delegated tasks and coordinate work with others in the group

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
Marked Tutorial Week 3	1			4%	3	LO 2: C1 LO 4: C1
Marked Tutorial Week 4	1			4%	4	LO 1: C1 LO 2: C1, C2 LO 3: C1, C2 LO 4: C1
Marked Tutorial Week 5	1			4%	5	LO 1: C1 LO 2: C1, C2 LO 3: C1 LO 4: C1, C2
DP41 Design Review	1			8%	6	LO 1: C1, C3 LO 2: C1, C2 LO 3: C1 LO 4: C1, C2
DP42 Conceptual Design Report	1	1		30%	10	LO 1: C1, C2, C3 LO 2: C1, C2, C3 LO 3: C1 LO 4: C1, C2
DP43 Detailed Design Report	2	1		50%	7	LO 1: C1 LO 2: C1, C4 LO 3: C1, C2, C3

Principles of Assessment Feedback

(within Assessment and Feedback Policy at: https://www.strath.ac.uk/staff/policies/academic/)

These are incorporated in this module as follows:

- The project activities are spread throughout the semester
- Individual and group feedback/feedforward is given to students on a weekly basis so that they have the opportunity to improve their work on an ongoing basis. General class feedback is provided for each assessed part.
- The design review in week 6 has low marks but creates a deadline which encourages students to start work on the conceptual design early in the semester. The review also allows feedback to be given at this key point in the project so that students can incorporate the advice given into their conceptual design report.
- The group project encourages peer dialogue covering many issues and also, structured discussion with the teacher.
- Assessment covers a range of skills and abilities (oral presentations, writing, sketching, structural calculations and technical drawings) so that students who have strengths in some skills, but not others, can still do well in this class.
- Coursework is broken down into the specific topics to be covered and the proportion of the overall marks allocated to each topic is specified.
- General feedback/feedforward to students in the previous year is discussed with current students, so that they are aware of which topics and parts of an assignment are likely to require the most effort.
- Examples of the presentation standard required for calculations and engineering drawings are provided on Myplace.

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Additional Information

Submission of DP43 Detailed Design Report in Semester 2 is compulsory. Students who fail to submit DP43 Detailed Design Report in Semester 2, will be marked as Absent, with a zero mark granted for the module.

Students must gain a summative mark of 40% overall to pass the module. This summative mark is the average between semester 1 and semester 2 marks.

Students who do not submit DP43 Detailed Design Report in Semester 2 or fail the module at the first attempt, will be re-examined during the resit diet in July/August. This re-examination will consist entirely of coursework with resit assessment procedures as above. The resit mark will be 100% of the resit coursework. No marks from any previous attempts will be transferred to a new resit attempt.

Resit Procedure

(Re)submission of DP43 Detailed Design Report, prior to commencement of the resit exam diet in July/August.

Recommended Reading

An extensive list of references for specific technical topics is provided in the briefing notes for the building design project.

Module Timetable

Week	Semester 1	Semester 2
0		
1		
2		
3	In Person 4%	
4	In Person 4%	
5	In Person 4%	
6	In Person 8%	
7		Submission 50%
8		
9		
10	Submission 30%	
11		
E		

Date of Last Modification

12-09-2025