MODULE DESCRIPTOR – 2020/2021

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

CL418 STRUCTURAL ENGINEERING 2

Module Registrar: **Viola Valentine**	**Taught To (Course): Compulsory to BEng/MEng Civil Engineering and optional to BEng/MEng Civil and Environmental Engineering**		
Other Lecturers Involved: **N/A**	**Credit Weighting: 20**	**Semester: 1 and 2**	
Assumed Prerequisites: **All compulsory civil engineering classes up to the end of 3rd year or equivalent**	**Compulsory/ optional/ ~~elective class~~**	**Academic Level: 4**	**Suitable for Exchange: Y/~~N~~ S1 only**

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	**Total**
26	10		10			80		74	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.

Learning Outcomes

On completion of the module the student is expected to gain

LO1: Knowledge of design processes and methodologies.

LO2: Ability to apply quantitative methods and use computer software in order to solve structural engineering problems.

LO3: Understanding of appropriate codes of practice and industry standards.

LO4: Ability to work in a group on a complex design brief.

Syllabus

The module will teach the following:

- The design process
- Preparation of a requirements statement
- Conceptual structural design
- Option analysis (optioneering)
- Loadings and Eurocode load combinations
- Preliminary sizing of structural elements
- Yield line analysis – two-way spanning slabs
- Overall stability of structures
- Sub frame analysis
- Reinforced concrete column design

Assessment of Learning Outcomes

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

LO1: Knowledge of design processes and methodologies
- C1 Appreciation of the IStructE Design Process and RIBA Plan of Work
- C2 Ability to prepare a requirements statement
- C3 Knowledge of methods for option analysis

LO2: Ability to apply quantitative methods and use computer software in order to solve structural engineering problems.
- C1 Detailed understanding of structural behaviour and loadings applied to structures
- C2 Able to carry out structural analysis using computer software and verify the results
- C3 Able to carry out initial sizing of structural elements for conceptual design purposes

LO3: Understanding of appropriate codes of practice and industry standards.
- C1 Ability to carry out technical design of structural elements in accordance with the Eurocodes
- C2 Ability to calculate loadings onto structures in accordance with the Eurocodes or British Standards
- C3 Ability to prepare a detailed structural design report including text, sketches, calculations and drawings

LO4: Ability to work in a group on a complex design brief.
- C1 Ability to develop a complex design brief
- C2 Ability to work on delegated tasks and coordinate their work with others in the group

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

Principles of Assessment and 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
- Feedback to groups is given on a weekly basis so that they have the opportunity to improve their work on an ongoing basis.
- 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 AutoCAD 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.
- Written general feedback comments given to students in the previous year is made available so that students are aware of which parts of an assignment are likely to require the most effort.
- Examples of the presentation standard required for calculations and engineering drawings plus model answers to assignments in earlier years are provided on Myplace.

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

	Examinations				**Courseworks**		**Projects**	
	Number	Month(s)	Duration	***Weighting***	Number	***Weighting***	Number	***Weighting***
					6	100%		
L/Outcomes					1, 2, 3 and 4			

Indicate which learning outcomes (LO1, LO2 etc) are to be assessed by exam/coursework/project as required.

Coursework / Submissions deadlines (*academic weeks*): Semester 1 weeks 3, 4, 5, 6 and 10 and semester 2 week 7.
Resit Assessment Procedures: Resubmission of DP43 prior to commencement of the August exam diet.

PLEASE NOTE:
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 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.

Recommended Reading

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

Additional Student Feedback
(Please specify details of when additional feedback will be provided)

Date	Time	Room No

Session:

Approved:

Course Director Signature:
Date of Last Modifications: August 2021

ASSESSMENT TIMETABLE

Module Code	CL418	Module Title	Structural Engineering 2

Indicate in the tables below the Hand-Out (H), Submission (S) and Feedback (F) week number for each assignment (lab report/coursework/project etc) and the timing of each Exam (E), Class Test (CT) or Quiz (Q)

Semester 1

Assessment type & title	LOs	Weight (%)	Individual or Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
Weekly Tutorials	1, 2 and 4	3x4% = 12%	Group	H		S/F	S/F	S/F							
Design Review DP41	1, 2 and 4	8%	Group	H					S/F						
Conceptual Report DP42	1, 2 and 4	30%	Group	H									S		F

Semester 2

Assessment type & title	LOs	Weight (%)	Individual or Group	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
Detailed Report DP43	2 and 3	50%	Individual	H						S			F		

Appendix

Mapping Module Learning Outcomes to AHEP

Learning outcomes	Engineering Council AHEP competencies
LO1: Knowledge of design processes and methodologies.	Design and Engineering Practice
LO2: Ability to apply quantitative methods and use computer software in order to solve structural engineering problems.	Engineering Analysis and Engineering Practice
LO3: Understanding of appropriate codes of practice and industry standards.	Design and Engineering Practice
LO4: Ability to work in a group on a complex design brief.	Engineering Practice

Programme Threads

	Assessment Title		
Thread	**Primary**	**Secondary**	**Contributory**
Design	**X**		
Health, Safety & Risk Assessment		**X**	
Sustainability		**X**	
Professionalism, Ethics, Diversity and Inclusion			**X**
Application of Maths to solve engineering problems			
Industrial Engagement & Site Visits			**X**
Digital Technologies	**X**		