

Module Details	
Module Title	Advanced Steel And Concrete Design
Module Code	CSE6011-B
Academic Year	2024/5
Credits	20
School	School of Built Environment, Architecture & Creative Industries
FHEQ Level	FHEQ Level 6

Contact Hours	
Type	Hours
Lectures	36
Tutorials	4
Directed Study	156

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Academic Year

Module Aims
<p>This module aims to introduce the students with the advanced principles/ concept for design and analysis of steel and concrete structures and their constructability. Following the successful completion of this module, the students should enrich their creativity skills and ability to design structures in steel and concrete, preparing them for employment as a structural engineer.</p>

Outline Syllabus
<ol style="list-style-type: none"> 1. Design steel framed buildings for robustness and sway stability; understanding the modes of failure and how to design against risks (UNSDG-9&12&13); 2. Design of multi-storey unbraced steel framed structures and joints (UNSDG-9); 3. Design of steel-concrete composite structures (UNSDG-9&12&13); 4. Design of reinforced concrete flat slabs (UNSDG-9&12&13); 5. Design of prestressed concrete elements (UNSDG-9&12&13); 6. Design of slender reinforced concrete columns; 7. Throughout the module topics, the principle of structural design for sustainability and net zero: build nothing, build less, build clever, build efficiently (UNSDG-11 &12&13).

Learning Outcomes	
Outcome Number	Description
01	Apply their prior knowledge and understanding of the scientific and mathematical principles of engineering to the design of steel, concrete and composite structures
02	Analyse, evaluate and design advanced steel, concrete and composite structures according to ultimate and serviceability limit states;
03	Apply mathematical and computer-based models for solving problems in structural engineering and be able to assess the limitations of each particular case;
04	Explore the latest research and developing technologies related to the design of steel, concrete and composite structures;
05	Acquire advanced knowledge and understanding of a specialised area of knowledge and skills (in the context of advanced steel & concrete design) via directed independent study identified by lecturers.

Learning, Teaching and Assessment Strategy
<p>Learning & Teaching Strategy: Variety of teaching and learning techniques are followed to encourage student learning and engagement (PPT, videos, online tutorials, laboratory, online lectures). The concepts, principles and theories related to advanced steel and concrete design are given in interactive lectures with worked examples.</p> <p>In terms of directed study, students are encouraged to study the lecture note and solve the tutorial sheet given at the end of each topic and submitted the tutorial sheet for formative feedback.</p> <p>The students are provided with a well organised set of lecture notes and tutorial problems available via VLE. The students will be given the opportunity to solve the tutorial problems and receive feedback to enhance their design skills.</p> <p>The students will be given opportunities to discuss their knowledge and understanding in a group or individually with the tutor.</p> <p>Many solved/practical examples produced by professional organisations will be available on VLE.</p> <p>Two computer aided learning design software are available to aid the student learning (CALcrete is a comprehensive suite of 16 computer aided e-learning modules on concrete materials, design and construction, containing essential material and information for all construction professionals - from architects to site engineers and SteelCAL).</p> <p>A set of videos and documentations to help student visualize and understand the behaviour of steel and concrete members are uploaded on VLE. There will be also a comprehensive reading list covering up-to- date books and articles.</p> <p>The module is assessed through 2 exams which take place at the end of semester 1 and semester 2.</p> <p>Assessment Strategy: 2 exams (one at the end of each semester). The assessments will focus on the design of steel and reinforced concrete structural elements. Each exam will be weighted 50%. Past exam papers will be practiced in tutorial sessions.</p>

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Examination - Closed Book	Closed book examination (Sem 1) (2 Hrs)	50%
Summative	Examination - Closed Book	Closed Book examination (Sem 2) (2 Hrs)	50%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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