Liverpool John Moores University

Title:	STRUCTURAL ANALYSIS AND DESIGN
Status:	Definitive
Code:	**5123BEUG** (117993)
Version Start Date:	01-08-2021
Owning School/Faculty:	Civil Engineering and Built Environment
Teaching School/Faculty:	Civil Engineering and Built Environment

Team	Leader
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Academic Level:	FHEQ5	**Credit Value:**	24	**Total Delivered Hours:**	105
Total Learning Hours:	240	**Private Study:**	135		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	48
Practical	6
Tutorial	48

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	3
Report	AS2	Lab Reports and Analysis	15	
Technology	AS3	Structural Design & Drawing	15	

Aims

To introduce the analysis of statically indeterminate structures and the analysis of the plastic behaviour of steel structures.
To design and detail structural elements in reinforced concrete and structural

steelwork using Eurocodes 2 & 3.

Learning Outcomes

After completing the module the student should be able to:

1	Analyse indeterminate beams and rectangular portal frames using moment distribution.
2	Evaluate deflection in beams and frames.
3	Analyse steel beams and frames behaving plastically.
4	Analyse columns subjected to axial load, transverse load and moments.
5	Design and detail flexural and compression elements in reinforced concrete.
6	Design and detail continuous flanged beams in reinforced concrete.
7	Design and detail flexural and compression elements in structural steel.
8	Design connections between steel elements.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAMINATION	1	2	4	5	7	8
LAB REPORTS & ANALYSIS	3					
STRUCTURAL DESIGN & DRAWING	6					

Outline Syllabus

Analysis of beams:
Statically indeterminate beams, deflection, composite (flitch) beams.
Analysis of frames:
Moment distribution, plastic analysis, virtual work.
Analysis of columns
Reinforced concrete design and detailing to EC2 of rectangular and flanged beams, slabs, pad foundations and stocky columns.
Structural steelwork design and detailing to EC3 of laterally restrained and unrestrained beams, columns and connections.

Learning Activities

Lectures, tutorials, problem solving sessions, laboratory practical work, use of specialist computer software.

Notes

This module expands the student's experience of structural behavior and design to include the analysis of statically indeterminate structures and to introduce the

analysis of structures allowed to deform plastically.
Structural elements and frames are then designed and detailed in reinforced concrete and structural steelwork using Eurocodes 2 & 3.