

Structural Analysis and Design

Module Information

2022.01, Approved

Summary Information

Module Code	4305CIVH
Formal Module Title	Structural Analysis and Design
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Civil Engineering and Built Environment

Learning Methods

Learning Method Type	Hours
Lecture	48
Practical	8
Workshop	16

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	28 Weeks

Aims and Outcomes

Aims	To provide learners an opportunity to develop the skills required to analyse statically determinate structures in compliance with current codes of practice and standards and design and detail structural elements. To demonstrate and explore structural behaviour through experimentation.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Analyse bending moments and shear forces for statically determinate structures.
MLO2	2	Analyse bending deflections for statically determinate structures.
MLO3	3	Appraise the behaviour of elastic columns subjected to axial loading.
MLO4	4	Apply design methods and detail elements of a structure.
MLO5	5	Design beams and columns in steel and reinforced concrete.
MLO6	6	Undertake structural experimental procedures.

Module Content

Outline Syllabus	Axial forces: Frames; resolution of joints; method of sections; horizontal, vertical and inclined members. Bending moments and shear forces: cantilevers and supported beams; point loads; uniformly distributed loads; bending moment diagrams; shear force diagrams. Properties of sections: sectional properties (simple beam sections); use of standard formulae or manufacturer's published tables in steel and in-situ reinforced concrete. Bending deflections: bending deflection in beams (variety of materials for beam selection) Bending stresses: variation across a section for simply supported beams and cantilevers; axial and bending stress on a column. Axial load carrying capacity: elastic buckling, Euler's method, concept of effective length. Design methods: steel beams and columns; concept of limit state design, classification of Universal Beam and Universal Column sections; moment capacity, shear resistance and deflection, Concrete beam and column reinforcing requirements, design status of column, columns under axial load with bending moments about one axis; timber beams and posts, masonry columns (square and rectangular only).
Module Overview	This module enables you to focus on the skills required to analyse construction designs and appraise statically determinate structures. You will carry out the design of common structural elements to the appropriate British Standard, Code of Practice or European Code of Practice.
Additional Information	This module focuses on the skills required to analyse construction designs and appraise statically determinate structures. Learners will carry out the design of common structural elements to the appropriate British Standard, Code of Practice or European Code of Practice.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	REPORT <2000 WORDS	40	0	MLO1, MLO6
Centralised Exam	Examination	60	2	MLO1, MLO2, MLO3, MLO4, MLO5, MLO6

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Yaser Jemaa	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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