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Title: ADVANCED STRUCTURAL ANALYSIS AND DESIGN
Status: Definitive
Code: **5011BEHN** (102313)
Version Start Date: 01-08-2016

Owning School/Faculty: Civil Engineering
Teaching School/Faculty: Civil Engineering

Team	Leader
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Academic Level: FHEQ5 **Credit Value:** 12 **Total Delivered Hours:** 45
Total Learning Hours: 120 **Private Study:** 75

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	24
Practical	6
Tutorial	12

Grading Basis: BTEC

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	open book	70	3
Report	AS2	assignment plus lab work	30	

Aims

To develop the student's ability to analyse complex structures and produce an appropriate design.

To provide the student with the analysis and design knowledge required to carry out the design of structural elements to the appropriate British Standard Code of Practice or European Code of Practice.

To gain the skills and understanding to develop effective and economic designs by working with real life examples.

To use computer analysis and design methods in conjunction with more traditional techniques.

Learning Outcomes

After completing the module the student should be able to:

- 1 Calculate bending moments and shear forces for indeterminate beams.
- 2 Analyse frames under various loading conditions.
- 3 Design continuous beams in steel and reinforced concrete.
- 4 Design simple connections for steel structures.

Learning Outcomes of Assessments

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

EXAM	1	2	3	4
REPORT	1	2		

Outline Syllabus

Bending moments and shear forces: Analyse indeterminate beams: two span beams with a variety of loading and end conditions using moment distribution.
Plastic analysis techniques to analyse the behaviour of beams under ultimate loads
Bending moment and shear force envelopes for the analysis of continuous beams.
Design and detailing of continuous beams in reinforced concrete
Lateral torsional instability as applied to steel.
Design methods for simple connections: both bolted and welded.

Learning Activities

Lectures, tutorials, problem solving sessions. Laboratory sessions.

Notes

Students will, in general work individually, with some groupwork in classroom situations. Emphasis is placed on manual analysis techniques to determine the values required for the subsequent design procedures, however the student is encouraged to verify manual designs by computer methods.