

Liverpool John Moores University

Title: Engineering Analysis
Status: Definitive
Code: **7110BEUG** (120607)
Version Start Date: 01-08-2018

Owning School/Faculty: Civil Engineering
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
Glynn Rothwell	Y
Russell English	
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Academic Level: FHEQ7 **Credit Value:** 20 **Total Delivered Hours:** 72
Total Learning Hours: 200 **Private Study:** 128

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Practical	48

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	Test 1	Invigilated VLE Test	40	
Test	Test 2	VLE Test with seen part	60	

Aims

The module will introduce students to computational engineering analysis using finite element analysis (FEA) and computational fluid dynamics (CFD) and will extend their experience and skill with the aid of industry standard software.

Learning Outcomes

After completing the module the student should be able to:

- 1 Set up and validate efficient and accurate FEA and CFD models
- 2 Identify and critically analyse the limitations of FEA and CFD as part of the engineering design process
- 3 Critically evaluate the output from FEA and CFD analysis
- 4 Demonstrate critical appreciation and application of the theory underpinning commercial FE and CFD codes

Learning Outcomes of Assessments

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

Invigilated VLE Test	1	2	3	4
V.L.E. test with seen part	1	2	3	4

Outline Syllabus

Practical aspects of FEA

Modelling strategy. Planning the analysis. Post processing and results checking.

Thermal analysis and thermal stress analysis.

Modal Dynamics.

Shell and beam modelling. Modelling thin components, shells. Modelling using beam elements. Mixed meshing, solids, shells and beams.

Theoretical aspects of FEA; General FEA principles,

Global stiffness matrix assembly and solution.

Practical and theoretical aspects of CFD.

Learning Activities

Lectures, tutorial and practicals.

Notes

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