

Liverpool John Moores University

Title: ENGINEERING SCIENCE 2
Status: Definitive
Code: **4003ME** (115879)
Version Start Date: 01-08-2016

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

Team	Leader
Russell English	Y
Jack Mullett	

Academic Level: FHEQ4 **Credit Value:** 20 **Total Delivered Hours:** 76
Total Learning Hours: 200 **Private Study:** 124

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	44
Practical	8
Tutorial	22

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	50	2
Report	AS2	Laboratory and Tutorial Workbook, Maple TA	50	

Aims

To introduce the essential further principles of engineering science

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse thermodynamic processes involving vapours in closed and open systems.
- 2 Solve problems in Hydrostatics.
- 3 Analyse problems of simple fluid flow
- 4 Apply the principles of work, energy, power, impulse and momentum to the solution of engineering problems.
- 5 Determine the shear force and bending moment distribution in flexural loaded beams.
- 6 Determine bending and torsional stresses for beams and shafts under load

Learning Outcomes of Assessments

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

EXAM	1	2	3	4	5	6
Laboratory and Tutorial Workbo	1	2	3	4	5	6

Outline Syllabus

Fluid Mechanics definitions, pressure, density, viscosity, stream lines and stream tubes etc.
Hydrostatics, manometry, forces of submerged surfaces, buoyancy.
Continuity of flow for compressible and incompressible fluids.
Applications of conservation of energy, conservation of mass.
Conservation of momentum, momentum equation for 1D and 2D fluid flow.
Bernouli's equation and the conservation of energy in the flow through a stream tube.
Applications of continuity, momentum and energy Equations.
Concepts of work, energy and power. Conservation of energy.
Impulse and Momentum with application to collisions and impacts. Interpretation of experimental results both numerical and graphical.
Concept of shearing forces and bending moments in transversely loaded beams.
Determination of bending and torsional stresses in beams and shafts.

Learning Activities

A combination of Laboratories, Tutorials and Lectures.

Notes

This module is designed to provide an introduction to Engineering science which incorporates the subjects of Mechanics, Materials, Thermodynamics and Fluid Mechanics