

Liverpool John Moores University

Title: MECHANICAL SYSTEMS ENGINEERING
Status: Definitive
Code: **3009ENG** (105562)
Version Start Date: 01-08-2016

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

Team	Leader
Geraint Phylip-Jones	Y

Academic Level: FHEQ3 **Credit Value:** 12 **Total Delivered Hours:** 38
Total Learning Hours: 120 **Private Study:** 82

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	24
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	AS1	CW1	20	
Test	AS2	CW2	20	
Test	AS3	In class test	10	
Exam	AS4	Examination	50	2

Aims

To extend and enhance the mechanical science/technology elements studied in 3000ENG to include energy interaction, kinematics, dynamics, statics, hydrostatics and elementary stress/strain behaviour.

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse simple mechanical systems through the application of the equations of linear motion and Newton's Laws including Work energy and power.
- 2 Perform calculations on simple mechanical problems involving linear elastic behaviour in terms of displacement, stress and strain.
- 3 Analyse simple thermodynamic systems by application of the non-flow energy equation and the perfect gas equations.

Learning Outcomes of Assessments

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

problem solving exercise 1	1		
problem solving exercise 2	3		
In class test	1	2	
EXAM	1	2	3

Outline Syllabus

Use of units and unity brackets, Kinematics: linear equations of motion (1D). Dynamics: Newton's laws of motion. Simple energy and power relations and their application. Elastic stress and strain, Hooke's law, Young's modulus. Introduction to thermodynamics - system and surroundings approach. W and Q, sign convention. Temperature scales. Specific heats (solids, liquids and gases). Non-flow energy equation. Gas laws, gas constants, the perfect gas equation and its applications. Use of p-V diagram representations. Simple hydrostatics, measurement of pressure - gauge and absolute. Basic manometry, variation of pressure with depth

Learning Activities

Full lecture and tutorial programme focussed around real world applications

Notes

This broadbased module aims to underpin the intrinsic mechanical technology requirements for entry to the various degree programmes in the School of Engineering, Technology and Maritime Operations.