Modelling and Simulation

Module Information

2022.01, Approved

Summary Information

Module Code	5311MECH
Formal Module Title	Modelling and Simulation
Owning School	Engineering
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Practical	11
Tutorial	11

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	This module aims to introduce methods for modelling and simulating engineering systems. Students will learn how to create models (typically 1-D) which may be represented using software, parameterized and simulated to create results which allow them to explore their behaviour.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Choose an appropriate method for modelling a simple mechanical engineering system.
MLO2	2	Use appropriate combinations of modelling elements which may be used to describe typical engineering systems.
MLO3	3	Construct computer-based representations of a simple model, set parameters and apply boundary conditions.
MLO4	4	Execute simulation, collect data and visualize results.
MLO5	5	Apply methods for checking the validity of results.

Module Content

Outline Syllabus	- Mechanical systems – mass, stiffness, damping - Electrical systems – inductance, capacitance, resistance - Thermal and fluid systems - Initial conditions - External inputs and disturbances - Model parameterisation - State-variables - Data handling and visualization - Sensitivity and optimisation
Module Overview	
Additional Information	This module includes content which relates to the following UN Sustainable Development Goals: SDG09,SDG12 – This module gives students the ability to apply methods for evaluating the performance of engineering systems and to use simple strategies for the optimisation of performance and efficiency.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	Simulation Model and Report	100	0	MLO1, MLO2, MLO3, MLO4, MLO5

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Christian Matthews	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings