

Summary Information

Module Code	5514USST
Formal Module Title	Modelling and Simulation
Owning School	Engineering
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 5
Grading Schema	40

Module Contacts**Module Leader**

Contact Name	Applies to all offerings	Offerings
Dante Matellini	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
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Partner Module Team

Contact Name	Applies to all offerings	Offerings
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Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
University of Shanghai For Science and Technology

Learning Methods

Learning Method Type	Hours
Practical	11
Tutorial	11

Module Offering(s)

Offering Code	Location	Start Month	Duration
JAN-PAR	PAR	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.
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Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Choose an appropriate method for modelling a simple mechanical engineering system.
MLO2	Use appropriate combinations of modelling elements which may be used to describe typical engineering systems.
MLO3	Construct computer-based representations of a simple model, set parameters and apply boundary conditions.
MLO4	Execute simulation, collect data and visualize results.
MLO5	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)	Learning Outcome Mapping
Technology	Technology	100	0	MLO1, MLO2, MLO3, MLO4, MLO5