

### Summary Information

Module Code	6513USST
Formal Module Title	Dynamics and Control
Owning School	Engineering
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 6
Grading Schema	40

### 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
Lecture	22
Practical	6
Tutorial	11

### Module Offering(s)

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

## Aims and Outcomes

Aims	To develop knowledge and experience of analytic and simulative methods applied to modelling of open and closed loop engineering systems with multi-physics dynamics.
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**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Assess and apply modelling methods to derive the dynamic equations governing mechanical systems, thermal systems and fluid systems.
MLO2	2	Derive dynamic system models in State-Space or Transfer Function notation.
MLO3	3	Apply modern computer aided methods to simulate system dynamics.
MLO4	4	Design and implement open and closed loop control systems using frequency domain methods.

## Module Content

Outline Syllabus	Outline syllabus Use classical modelling methods to derive the differential equations for a dynamic system. Apply Laplace methods to convert the governing differential equations into their Frequency Domain representations. Apply simulation methods to solve the dynamic systems differential governing equations in the time and frequency domains. Demonstrate an understanding about the differences between open loop and closed loop dynamic systems strategies. Discuss the conversion of the open loop systems into their respective closed loop system formalisms. Validate using simulation methods how this leads to improve system dynamics.
Module Overview	
Additional Information	In this module the student develops knowledge and experience of analytic and simulative methods applied to modelling of open and closed loop engineering systems with multi-physics dynamics. The module exposes the student to modern object orientated simulation.

## Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Examination	70	2	MLO1, MLO2, MLO3, MLO4
Portfolio	Portfolio	30	0	MLO1, MLO2, MLO3, MLO4

## Module Contacts

### Module Leader

Contact Name	Applies to all offerings	Offerings
Dan Stancioiu	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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