Module Proforma

Approved, 2022.01

Summary Information

Module Code	6564USST
Formal Module Title	Dynamics and Control
Owning School	Engineering
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 6
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

Partner Module Team

Contact Name	Applies to all offerings	Offerings

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	11
Tutorial	11

Module Offering(s)

Offering Code	Location	Start Month	Duration
JAN-PAR	PAR	January	12 Weeks

Aims and Outcomes

Aims	The module aims to develop knowledge and experience of analytic and simulative methods applied to modelling and control design of open loop and closed loop engineering systems.

Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Apply modelling methods to derive the dynamic equations governing mechanical, electromechanical or thermal systems.
MLO2	Derive and analyse dynamic system models in state-space and transfer function notation.
MLO3	Use modern computer aided methods to simulate system dynamics and estimate time and frequency response parameters and their influence on product performance.
MLO4	Design and test open and closed loop control systems using computer aided methods.

Module Content

Outline Syllabus
Use classical modelling methods to describe the dynamics of simple mechanical, electromechanical, or thermal systems with application to automotive, aerospace and offshore engineering. Apply qualitative analysis or computer aided simulation methods to estimate the response of a first order or second order dynamic system. Apply computer aided techniques to interactively design and tune closed loop feedback systems. Test and validate design solutions using simulation techniques.

Module Overview

Additional Information
The module exposes the student to industry recognised simulation software. On successful completion of the module the student will be able to use computational methods to perform simulation-based product performance analysis and design control solutions based on prescribed dynamic response requirements. This module includes content which relates to the following UN Sustainable Development Goals: SDG11 – This module will consider how engineering designers can consider sustainability when developing new products. It will give students key knowledge for product development in line with efforts of sustainable industrialisation and carbon emission reduction by 2030.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Exam	Exam	100	2	MLO1, MLO2, MLO3, MLO4