

Summary Information

Module Code	6313MECH
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
Engineering

Learning Methods

Learning Method Type	Hours
Lecture	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	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.
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After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Apply modelling methods to derive the dynamic equations governing mechanical, electromechanical or thermal systems.
MLO2	2	Derive and analyse dynamic system models in state-space and transfer function notation.
MLO3	3	Use modern computer aided methods to simulate system dynamics and estimate time and frequency response parameters and their influence on product performance.
MLO4	4	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)	Module Learning Outcome Mapping
Centralised Exam	Examination	100	2	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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