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Title: Dynamics and Control
Status: Definitive
Code: **6113MECH** (121351)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
Dan Stancioiu	Y
Christian Matthews	

Academic Level: FHEQ6 **Credit Value:** 10 **Total Delivered Hours:** 41
Total Learning Hours: 100 **Private Study:** 59

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	11
Online	11
Practical	6
Tutorial	11

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	2
Portfolio	AS2	Portfolio	30	

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.

Learning Outcomes

After completing the module the student should be able to:

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

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Examination	1	2	3	4
Portfolio	1	2	3	4

Outline Syllabus

Outline syllabus

Use classical modelling methods to derive the differential equations for a dynamic system.

Apply simulation methods to determine the response of a dynamic system in time and frequency domain.

Apply computer aided techniques to design closed loop feedback systems.

Validate design methods using simulation techniques and assess the improvement in system dynamics.

Learning Activities

Lectures and tutorials

Notes

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.