



## **Module Specification**

### **Control Engineering**

Version: 2024-25, v6.0, 12 Feb 2024

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## Part 1: Information

**Module title:** Control Engineering

**Module code:** UFMFYJ-15-3

**Level:** Level 6

**For implementation from:** 2024-25

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**College:** College of Arts, Technology and Environment

**School:** CATE School of Engineering

**Partner institutions:** None

**Field:** Engineering, Design and Mathematics

**Module type:** Module

**Pre-requisites:** Engineering Mathematics 2 2023-24, Mathematics for Signals and Control 2023-24

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** Pre-requisites: students must take one out of UFMFK9-15-2 Engineering Mathematics 2 or UFMFL9-15-2 Mathematics for Signals and Control

**Features:** The delivery of the module employs the flipped approach, which engenders student-centred active learning. Contact time will be conducted in TEAL spaces, with students working in groups on in-class exercises, making extensive and effective use of simulation software to visualise and facilitate learning of control

systems engineering. Peer-learning is actively encouraged among these ad-hoc groups.

**Educational aims:** See Learning Outcomes

**Outline syllabus:** System modelling (Laplace operator, transfer functions etc)

Time response of first and second order systems

Block diagram representation

Frequency response of first and second order systems

System identification

The s-plane and root loci

Controllers (PID, IP-D etc)

State Space modelling techniques

Approaches to dealing with non-linearity

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** Large group lecture supported by small group tutorial sessions. Study time outside of contact hours will be spent on going through exercises and example problems. Lab sessions and demonstrations will provide experience of modelling and simulation. Scheduled learning includes lectures, tutorials\lab sessions. Independent learning includes hours engaged with essential reading, assignment preparation and completion etc.

Activity Approximate time, h

Contact (36)

Directed Learning (24)

Self-directed learning (45)

Exam preparation (45)

Total (150)

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Demonstrate knowledge of scientific principles and methods necessary to underpin their education in mechanical and related engineering disciplines, to enable appreciation of its scientific and engineering context and to support their understanding of future developments and technologies.

**MO2** Demonstrate knowledge of mathematical principles necessary to underpin their education in mechanical and related engineering disciplines and to enable them to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems.

**MO3** Apply and integrate knowledge of other engineering disciplines to support the study of mechanical and related engineering disciplines.

**MO4** Use engineering principles and apply them to analyse key engineering processes.

**MO5** Identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmfyj-15-3.html) via the following link <https://uwe.rl.talis.com/modules/ufmfyj-15-3.html>

## **Part 4: Assessment**

**Assessment strategy:** Assessed via end of semester Exam.

Formative assessments (not contributing to module mark) is provided via support in tutorial sessions.

**Assessment tasks:****Examination** (First Sit)

Description: Examination: 3 hours

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Mechanical Engineering (Manufacturing) [AustonSingapore] BEng (Hons) 2024-25

Mechanical Engineering (Manufacturing) [BIET] BEng (Hons) 2024-25

Electro-mechanical Engineering (Nuclear) {Apprenticeship-UCW}{Top-Up}[Frenchay]  
BEng (Hons) 2024-25

Mechanical Engineering (Mechatronics) [AustonSingapore] BEng (Hons) 2024-25

Electro-mechanical Engineering {Apprenticeship-UCW}{Top-Up}[Frenchay] BEng  
(Hons) 2024-25

Mechanical Engineering (Mechatronics) [BIET] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons)  
2021-22

Mechanical Engineering and Vehicle Technology {Foundation}  
[Feb][FT][GCET][4yrs] - Withdrawn BEng (Hons) 2021-22

Mechanical Engineering and Vehicle Technology {Foundation} [Oct][FT][GCET][4yrs]  
- Withdrawn BEng (Hons) 2021-22

Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Mechanical Engineering {Apprenticeship-GlosColl} {Top-Up} [Frenchay] BEng (Hons) 2023-24

Mechanical Engineering {Apprenticeship-UCW} {Top-Up} [Frenchay] BEng (Hons) 2023-24

Mechanical Engineering {Apprenticeship-UCS} {Top-Up} [Frenchay] BEng (Hons) 2023-24

Mechanical Engineering [Frenchay] BEng (Hons) 2022-23

Automotive Engineering [Frenchay] MEng 2022-23

Automotive Engineering [Frenchay] BEng (Hons) 2022-23

Mechanical Engineering [Frenchay] MEng 2022-23

Aerospace Engineering [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering [Frenchay] MEng 2022-23

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2022-23

Mechanical Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Mechanical Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Mechanical Engineering and Technology {Foundation} [Feb][FT][GCET][4yrs] BEng (Hons) 2021-22

Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

Mechanical Engineering and Technology (Vehicle Technology) {Foundation} [Feb][FT][GCET][4yrs] BEng (Hons) 2021-22

Mechanical Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2021-22

Mechanical Engineering and Technology {Foundation} [Oct][FT][GCET][4yrs] BEng (Hons) 2021-22

Mechanical Engineering and Technology (Vehicle Technology) {Foundation} [Oct][FT][GCET][4yrs] BEng (Hons) 2021-22

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs]  
BEng (Hons) 2021-22

Automotive Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-  
22

Automotive Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Automotive Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

Mechanical Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

Mechanical Engineering [Sep][PT][Frenchay][7yrs] MEng 2021-22

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-  
22

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-  
21

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs]  
BEng (Hons) 2020-21

Mechanical Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-  
21

Automotive Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-  
21

Automotive Engineering {Foundation} [Sep][SW][Frenchay][6yrs] - Not Running  
MEng 2020-21

Automotive Engineering {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running  
BEng (Hons) 2020-21