



Module Specification

Control

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Part 1: Information

Module title: Control

Module code: UFMFV7-15-2

Level: Level 5

For implementation from: 2023-24

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 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Control Engineering is a subject that spans and incorporates many disciplines of engineering. This module is designed to provide a solid foundation of knowledge, with practical exercises to form the link between the theory and techniques and the real engineering world.

Features: Not applicable

Educational aims: See Learning Outcomes.

Outline syllabus: Introduction to system modelling and the use of transfer functions. Developing models from first engineering principles, and using the Laplace operator “s”. Cross discipline examples.

System classification by order. System time responses and behaviour.

Introduction to Closed loop feedback control, the use and manipulation of Block diagrams.

Use of the “s” plane as a means of representing the system. Root locus plots.

Frequency response analysis and the relationship with the transfer function (system identification).

Modifying behaviour and the design of standard controllers

Use of computer software for simulation and design of control systems

Introduction to State space techniques and non-linearity

Part 3: Teaching and learning methods

Teaching and learning methods: Large group lecture supported by small group tutorial/laboratory sessions. Study time outside of contact hours will be spent on going through exercises and example problems.

Lab sessions (small groups) will provide a design opportunity to link the abstract theoretical concepts and techniques to real engineering tasks.

Scheduled learning includes lectures, tutorials and laboratory classes.

Independent learning includes hours engaged with essential reading, assignment preparation and completion etc.

Student contact time (in hours): (Module runs in one semester only):

Contact: 36

Assimilation and skill development: 64

Coursework preparation: 25

Exam preparation: 25

Total: 150

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

MO1 Understand the principles and methods used in control engineering across disciplinary boundaries

MO2 Demonstrate an understanding and knowledge of the key mathematical principles needed to properly analyse control systems

MO3 Apply and integrate knowledge from other engineering disciplines

MO4 Classify, identify and describe the performance of systems using analytical methods and modelling tools

MO5 Demonstrate the ability to apply appropriate theoretical and practical methods to the analysis and solution of control engineering problems

MO6 Show cognitive skills with respect to modelling and simplifying real problems, and applying mathematical methods of analysis

MO7 Demonstrate skills in problem formulation and decision making, interpreting experimental results

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/ufmfv7-15-2.html) via the following link <https://uwe.rl.talis.com/modules/ufmfv7-15-2.html>

Part 4: Assessment

Assessment strategy: Assessment Task 1:

Assessed via end of semester Exam, which is a summative assessment. Formative assessments (not contributing to module mark) are provided via support in tutorial/lab sessions.

Assessment Task 2:

Assignment based on laboratory work and design exercise. Formative assessments (not contributing to module mark) are provided via support in tutorial sessions.

Re-sit strategy is the same as first sit

Assessment tasks:

Examination (Online) (First Sit)

Description: Online End of semester exam: 2 hours + 2 hours for submission

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6, MO7

Practical Skills Assessment (First Sit)

Description: Assessment of practical work

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO5, MO6, MO7

Examination (Online) (Resit)

Description: Online Exam: 2 hours + 2 hours for submission

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6, MO7

Practical Skills Assessment (Resit)

Description: Assessment of simulated practical work

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3, MO5, MO6, MO7

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electrical and Electronic Engineering [AustonSingapore] BEng (Hons) 2023-24

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

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

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

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

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

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

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

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

Mechatronics [Sep][PT][UCS][3yrs] FdSc 2021-22

Mechatronics [Sep][PT][GlosColl][3yrs] FdSc 2021-22

Electronic Engineering [Sep][PT][Frenchay][6yrs] - Not Running BEng (Hons) 2020-21

Instrumentation and Control Engineering {Foundation} [Feb][PT][GCET][8yrs] BEng (Hons) 2018-19

Instrumentation and Control Engineering {Foundation} [Oct][PT][GCET][8yrs] BEng (Hons) 2018-19