Module Specification

Control Engineering

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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: Aerospace Systems Design 2023-24, Dynamics 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

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

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk 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

Examination (Resit)
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:

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

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

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

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

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

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

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

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

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

Aerospace Engineering [Frenchay] MEng 2022-23

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

Aerospace Engineering [Frenchay] MEng 2022-23

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

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

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

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

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

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

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

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

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

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

Automotive Engineering {Foundation} [Sep][SW][Frenchay][6yrs] - Withdrawn MEng 2020-21

Automotive Engineering {Foundation} [Sep][SW][Frenchay][5yrs] - Withdrawn BEng (Hons) 2020-21

Mechanical Engineering [Frenchay] MEng 2022-23

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

Automotive Engineering [Frenchay] MEng 2022-23

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

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

Aerospace Engineering [Frenchay] MEng 2022-23

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

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

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