Module Specification

Signal Theory

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Part 1: Information

Module title: Signal Theory

Module code: UFMFNT-15-2

Level: Level 5

For implementation from: 2021-22

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Delivery locations: Frenchay Campus

Field: Engineering, Design and Mathematics

Module type: Standard

Pre-requisites: Mathematical Modelling for Electronics and Robotics 2020-21

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module will cover the fundamentals of signals and signal processing, in continuous and discrete time, and shall focus on their applications in robotics. Mathematical theory will be supplemented with computer-based tools and laboratory problems.

Features: Not applicable

Educational aims: This module equips students with the knowledge and skills necessary to solve of a range of engineering, electronics and robotics problems which involve signals and signal processing.

Outline syllabus: This module will cover the following topics:

Introduction to Signals

Fourier Series

Continuous-time Fourier transform

Sampling Theorem and Reconstruction

Discrete-time Fourier transform (DTFT)

Laplace transform

Applications of signal processing techniques in robotics

Part 3: Teaching and learning methods

Teaching and learning methods: This module will combine lectures, class-based tutorials/computer workshops to ensure that students develop an understanding of theory, analytical techniques and real applications in robotics.

Module Learning outcomes:

MO1 Apply mathematical concepts and principles to describe, analyse and solve problems arising in signal processing

MO2 Evaluate the strengths and limitations of a variety of mathematical methods for solving signal theory problems

MO3 Apply mathematical methods in order to understand the performance of systems

MO4 Combining theory and engineering skills and the apply them to solve problems in signal processing

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 via the following link https://uwe.rl.talis.com/modules/ufmfl9-15-2.html

Part 4: Assessment

Assessment strategy: The assessment for this module consists of:

Component A: A written examination that assesses the students' understanding of mathematical concepts and techniques as applied to problems in the field of signal theory. The examination provides an appropriate mechanism to assess mathematical concepts and techniques learned throughout the module.

Component B: A coursework assessment that is both formative and summative and consists of multiple computer-based assignments, which are completed periodically during the semester. These assessments are designed to test students' ability to solve mathematical problems related to signal theory. The periodic feedback obtained by completing these assessments also helps students build their confidence in mathematics and prepares them for the written examination.

The resit assessment will consist of:
Component A: A written examination.

Component B: students will be required to complete multiple computer-based assignments.

Assessment components:

Examination (Online) - Component A (First Sit)
Description: Online, summative examination that assesses the students' understanding of mathematical concepts and techniques as applied to problems in the field of signals processing
Weighting: 75 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Online Assignment - Component B (First Sit)
Description: Completion of a series of computer based assessments
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) - Component A (Resit)
Description: Online examination
Weighting: 75 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Online Assignment - Component B (Resit)
Description: Multiple submission of exercises that are equivalent in scope of the first sit coursework
Weighting: 25 %
Final assessment: No
Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Robotics [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21

Robotics [Sep][FT][Frenchay][3yrs] BEng (Hons) 2020-21