Module Specification

Signals and Systems

Version: 2021-22, v5.0, 26 Apr 2022

Contents

Part 1: Information

Module title: Signals and Systems

Module code: UFMFMT-30-2

Level: Level 5

For implementation from: 2021-22

UWE credit rating: 30

ECTS credit rating: 15

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: Electronics pervades many areas of everyday life, and is being increasingly integrated in a variety of devices we interact with. The design and manufacturing of these electronic devices, either in the form of consumer electronic products or industrial systems require a sound knowledge of different subjects including signal processing, control systems and circuits and systems. Hence,

signals and systems is considered as one of the fundamental topics in any electrical and electronic related programme.

Features: Not applicable

Educational aims: This module covers the necessary concepts and principles for describing and analysing problems arising in circuits and systems, control systems and signal processing in both theory and practice. It also includes the analysis of problems, and design and implementation of solutions, involving signal-system interaction.

Outline syllabus: The module Signals and Systems covers the following topics:

Introduction to signals.

Fourier series

Laplace transform

Continuous time Fourier transform

Sampling theorem and reconstruction.

Introduction to discrete-time Fourier transform (DTFT).

Introduction to Z Transform

Matrix representation of systems and introduction to state space models

Introduction to feedback control systems

Part 3: Teaching and learning methods

Teaching and learning methods: This module will combine lectures, class-based tutorials/computer workshops and laboratory-based problem-solving work. Examples in workshops will be based on real electronic problems.

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

MO1 Apply mathematical concepts and principles to describe, analyse and solve problems arising in signal processing and electronic system analysis/design

MO2 Evaluate the strengths and limitations of the application of a variety of mathematical methods for solving signal processing and electronic systems problems

MO4 Combine theory and engineering skills and the apply them to solve practical problems in signal processing and control systems

MO5 Critically interpret technical literature to prepare technical reports.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Laboratory work = 48 hours

Total = 300

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/ufmfmt-30-2.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 domain problems in the field of signals and systems.

Component B: A coursework that consists of two components:

B1: This component consists of a series of e-assessments. These formative and summative assessments are designed to test students' ability to solve mathematical problems related to signal and systems theory.

B2: The second element of this component requires students to submit a group report focusing on the design and implementation of electronic systems. This assesses the ability of students of translating theoretical knowledge into simple electronic products.

The resit assessment will have the same format as the first sit assessment

Assessment components:

Examination (Online) - Component A (First Sit)
Description: Online examination: 4 hours
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2

Online Assignment - Component B (First Sit)
Description: E-Assessments
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2

Report - Component B (First Sit)
Description: Group report and demonstration of the electronic device that has been developed during the practical sessions (1500 words).
Weighting: 25 %

Final assessment: Yes
Group work: Yes
Learning outcomes tested: MO1, MO2, MO4, MO5

Examination (Online) - Component A (Resit)
Description: Online examination: 4 hours
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Online Assignment - Component B (Resit)
Description: E-Assessments
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2

Report - Component B (Resit)
Description: Group report and a conceptual design of an electronic device whilst reflecting on practical issues typically encountered in a laboratory setting (1500 words).
Weighting: 25 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electronic and Computer Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2020-21

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

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

Electronic Engineering {Apprenticeship-GLOSCOLL} [Sep][FT][GlosColl][5yrs] BEng (Hons) 2020-21

Mechatronics {Apprenticeship-UCW} [Sep][FT][UCW][3yrs] FdSc 2020-21

Electronic and Computer Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21