



MODULE SPECIFICATION

Part 1: Information			
Module Title	Digital Signal Processing		
Module Code	UFMFH8-15-3	Level	Level 6
For implementation from	2022-23		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		
Pre-requisites	Signals and Systems 2021-22		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Overview: This is an introductory course to linear digital signal processing (DSP). The course provides the students with basic knowledge in the field by introducing the necessary theoretical concepts. For the students to see the advantages, but also the limitations, of techniques and methods, the theory is backed by a series of lab exercises using appropriate software and hardware. This module focuses on key concepts for developing audio applications .</p> <p>Educational Aims: This modules allows students to extend their knowledge in capturing real world signals for the design and development of digital signal processing tasks.</p> <p>Outline Syllabus: Introduction and basic definitions. Time domain analysis: Digital convolution (definition, signal shifting, basic methods). Frequency domain analysis: Fourier Theory: Definition, discrete Fourier series, discrete Fourier transform, properties. z-transform: Definition, properties, z-transform vs Fourier transform, graphical approach. Filter design: FIR filter design (inverse Fourier transform and windowing). IIR filter design (Butterworth, Chebyshev, impulse response method). DSP chips.</p> <p>Teaching and Learning Methods: The module is delivered through a combination of lectures, laboratories, and student directed learning to ensure that students are able to integrate theoretical and practical analytical skills and also understand the wider context of the content.</p>

STUDENT AND ACADEMIC SERVICES

A study-guide is provided and relevant ethical issues will be highlighted and students will be encouraged to consider these further through directed reading.

Part 3: Assessment

The assessment for this module consists of the following:

Component B will be a project report submission and demonstration that contributes 50% towards the final mark of the module. The project assesses the students' ability to translate their theoretical knowledge to practice by implementing a DSP system and testing its performance. Formative assessment will be provided as oral feedback and feed forward throughout the laboratory sessions particularly with respect to the lab exercises.

Component A will be a written exam that contributes 50% towards the final mark of the module. The examination assesses the students' understanding of concepts and techniques, and their ability to apply them to Digital Signal Processing (DSP) problems.

Resit strategy:

Component B will be a report of the conceptual design of a DSP system.

Component A will be a written exam.

First Sit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Exam (2 hours)
Report - Component B		50 %	Report and demonstration. Guidance given for report formatting. Students will work in groups on the task but are expected to submit individual reports (maximum 10 pages)
Resit Components	Final Assessment	Element weighting	Description
Examination - Component A	✓	50 %	Exam (2 hours)
Report - Component B		50 %	Coursework report with similar scope to original coursework requirements (maximum 10 ages)

Part 4: Teaching and Learning Methods

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

Learning Outcomes	Module Learning Outcomes	Reference
	Apply engineering principles to digital systems and the ability to evaluate their performance (E1, E2)	MO1
	Demonstrate the ability to use integrated development environments to describe, simulate, implement and validate digital circuit designs (E3)	MO2
	Use technical literature and the ability to critically review ethics and documentation of a technical nature (P4)	MO3
	Apply advanced analytical techniques for signal and data processing applications.	MO4

STUDENT AND ACADEMIC SERVICES

Contact Hours	Independent Study Hours:	
	Independent study/self-guided study	114
	Total Independent Study Hours:	114
	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	12
	Laboratory work	24
	Total Scheduled Learning and Teaching Hours:	36
	Hours to be allocated	150
	Allocated Hours	150
Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/ufmfh8-15-3.html</p>	

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Electronic Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2018-19

Robotics [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20

Robotics {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2019-20

Electronic Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19

Robotics {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19