MODULE SPECIFICATION

Part 1: Information			
Module Title	Mathematics for Signals and Control		
Module Code	UFMFL9-15-2	Level	Level 5
For implementation from	2020-21		
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	Engineering Mathematics 2020-21		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: See Learning Outcomes

Outline Syllabus: Fourier Series: periodic functions and fundamental period, definition and computation of Fourier series, convergence of Fourier series, Fourier series of odd and even functions, half-range Fourier series, complex notation, amplitude and phase spectra.

Fourier Transforms: definition of the Fourier transform, spectra, properties of the Fourier transform, inverse Fourier transform, convolution.

Laplace Transforms: solution of linear differential equations, transfer functions, initial and final value theorems, convolution.

Z Transforms: definition of a z transform, sampling, properties of a z transform, inverse z transform, solving difference equations, z transfer function.

Systems of linear differential equations:, solution using eigenvalues and eigenvectors, system stability (definition and determination via eigenvalues); solution via Laplace transform, poles and system stability

Control theory: state-space models, transfer-function, matrix solution , poles and system stability.

Teaching and Learning Methods: Contact time: 36 hours

Assimilation and development of knowledge: 75 hours

Assessment: 39 hours

TOTAL: 150 HOURS

The module is delivered by means of lectures and tutorials. To prepare for assessment, students will be expected to undertake self directed learning in addition to the directed learning which supports taught classes.

Part 3: Assessment

The examination is summative and assesses students' understanding of concepts and techniques and their ability to apply them in relatively straightforward problems.

Coursework is both summative and formative, and consists of a series of eassessments using the Dewis system, designed to test student's ability to use concepts and techniques covered in lectures.

Feedback from coursework is intended to assist students to prepare for the end-of-year examination.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A	✓	75 %	Online Examination
Online Assignment - Component B		25 %	E-assessments
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A	✓	75 %	Online Examination
Online Assignment - Component B		25 %	E-assessments

Part 4: Teaching and Learning Methods

Learning Outcomes

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

Module Learning Outcomes	**Reference**
Use mathematical concepts and language to describe problems arising in control theory and signal processing	MO1
Solve such problems using transform and state-space methods	MO2
Show an understanding of the strengths and limitations of such methods	MO3
Communicate mathematical ideas and concepts in written form	MO4

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	36
	Total Scheduled Learning and Teaching Hours:	36
	Hours to be allocated	150
	Allocated Hours	150
Reading List	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/modules/ufmfl9-15-2.html	

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Robotics [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20 Electronic and Computer Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2019-20 Electronic and Computer Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20 Robotics [Sep][SW][Frenchay][4yrs] BEng (Hons) 2019-20 Automation and Robotics Engineering {Foundation} [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19 Robotics {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 Robotics {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19 Electronics and Telecommunication Engineering [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19 Electronics and Telecommunication Engineering [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19 Automation and Robotics Engineering {Foundation} [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19 Instrumentation and Control Engineering {Foundation} [Feb][FT][GCET][4yrs] BEng (Hons) 2018-19 Instrumentation and Control Engineering {Foundation} [Oct][FT][GCET][4yrs] BEng (Hons) 2018-19 Electronic Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2018-19 Electronic Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19 Electronic Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 Electronic and Computer Engineering [Sep][PT][GlosColl][5yrs] BEng (Hons) 2019-20