MODULE SPECIFICATION

Part 1: Information			
Module Title	Control Systems Design		
Module Code	UFMFW7-15-3	Level	Level 6
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	Signal Processing and Circuits 2020-21
Excluded Combinations	None
Co- requisites	None
Module Entry requirements	None

Part 2: Description

Educational Aims: See Learning Outcomes.

In addition to the learning outcomes, the educational experience may explore, develop, and practise but not formally discretely assess the following:

Self-management skills.
Progression to independent learning and team work.

Outline Syllabus: You will cover:

Enhanced classical control system analysis and design.
Control mathematics, such as matrix algebra, Laplace transform, z-transformer, differential equations, and difference equations, for control system modelling, analysis, and design.
Use of computational packages, such as Matlab, to analyse and design control systems.
Advanced control concepts such state-space representations, solution of state equations, controllability and observability; state-feedback, (pole placement) control design.
Modelling and analysis of multivariable control systems, to convert from the transfer function model to state space representation, and vice versa. Evaluation of dynamic plant performance in aspect of controllability and observability.

Design of multivariable state-feedback controllers, decoupling control systems, state observers.
Digital control system analysis and design with applications.
Basic mechanism on dynamic system modelling and identification from principles and data fitting.

Teaching and Learning Methods: The module will be delivered using a combination of lectures and tutorials/lab demonstrations involving example exercises.

Concepts and the scope of a topic will be introduced in lectures. These will be supported by directed reading and experimental simulation laboratory based work. The lab sessions will enhance the understanding of students of real-world applications of the material delivered in the module. The students will learn through applying a variety of analysis methods, mathematical and simulation tools to real system models. Matlab will be incorporated into the module as an integral part of teaching and learning and two hours used to demonstrate the principles.

In the teaching-learning process, the students will have opportunities to exercise both team work and independent effort.

Part 3: Assessment

There will be a final exam set at the end of the term and a total of 75% marks will be contributed from this element (A). The coursework (element B) is course work based report. Element B will contribute 25% marks to the final marks of the module.

In the resit run elements A and B will be the same as set in the first run.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A	✓	75 %	Online Exam
Report - Component B		25 %	Coursework report
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A	✓	75 %	Online Exam
Report - Component B		25 %	Coursework report

Part 4: Teaching and Learning Methods

Learning Outcomes

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

	Reference
Analysis and design techniques for both analogue and digital control systems	A1
	Reference
Selection and application of suitable techniques for the analysis and design of automatic control systems with regard to engineering processes	B1
	Reference
Operation and use of suitable computer based simulation software package	C1
The design and simulation of analogue and digital control systems	C2
	Reference
Problem formulation and decision making	D1
IT skills in context	D2

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/ufmfw7-15-3.html

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Electrical and Electronic Engineering {Top-Up} [May][PT][AustonSriLanka][1.3yrs] BEng (Hons) 2019-20
Electrical and Electronic Engineering {Top-Up} [Feb][PT][AustonSriLanka][1.3yrs] BEng (Hons) 2019-20
Electrical and Electronic Engineering {Top-Up} [Oct][PT][AustonSriLanka][1.3yrs] BEng (Hons) 2019-20
Electrical and Electronic Engineering {Top-Up} [May][PT][AustonSingapore][1.3yrs] BEng (Hons) 2019-20
Electrical and Electronic Engineering {Top-Up} [Feb][PT][AustonSingapore][1.3yrs] BEng (Hons) 2019-20
Electrical and Electronic Engineering {Top-Up} [Oct][PT][AustonSingapore][1.3yrs] BEng (Hons) 2019-20
Electronic Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19
Electronic Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19
Electronic and Computer Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19
Electronic and Computer Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19
Electronic and Computer Engineering [Sep][PT][GlosColl][5yrs] BEng (Hons) 2018-19
Electronic and Computer Engineering {Apprenticeship} [Sep][PT][GlosColl][5yrs] BEng (Hons) 2018-19