



## MODULE SPECIFICATION

Part 1: Information			
Module Title	Control		
Module Code	UFMFV7-15-2	Level	Level 5
For implementation from	2019-20		
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 2019-20		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p><b>Overview:</b> Control Engineering is a subject that spans and incorporates many disciplines of engineering. This module is designed to provide a solid foundation of knowledge, with practical exercises to form the link between the theory and techniques and the real engineering world.</p> <p><b>Educational Aims:</b> See Learning Outcomes.</p> <p><b>Outline Syllabus:</b> Introduction to system modelling and the use of transfer functions. Developing models from first engineering principles, and using the Laplace operator “s”. Cross discipline examples.</p> <p>System classification by order. System time responses and behaviour.</p> <p>Introduction to Closed loop feedback control, the use and manipulation of Block diagrams.</p> <p>Use of the “s” plane as a means of representing the system. Root locus plots.</p> <p>Frequency response analysis and the relationship with the transfer function (system identification).</p> <p>Modifying behaviour and the design of standard controllers</p>

## STUDENT AND ACADEMIC SERVICES

Use of computer software for simulation and design of control systems

Introduction to State space techniques and non-linearity

**Teaching and Learning Methods:** Large group lecture supported by small group tutorial/laboratory sessions. Study time outside of contact hours will be spent on going through exercises and example problems.

Lab sessions (small groups) will provide a design opportunity to link the abstract theoretical concepts and techniques to real engineering tasks.

Scheduled learning includes lectures, tutorials and laboratory classes.

Independent learning includes hours engaged with essential reading, assignment preparation and completion etc.

Student contact time (in hours): (Module runs in one semester only):

Contact: 36

Assimilation and skill development: 64

Coursework preparation: 25

Exam preparation: 25

Total: 150

### Part 3: Assessment

Component A:

Assessed via end of semester Exam, which is a summative assessment. Formative assessments (not contributing to module mark) are provided via support in tutorial/lab sessions. End of semester exam is two hours.

Component B:

Assignment based on laboratory work and design exercise. Formative assessments (not contributing to module mark) are provided via support in tutorial sessions.

First Sit Components	Final Assessment	Element weighting	Description
Practical Skills Assessment - Component B		50 %	Assessment of practical work
Examination - Component A	✓	50 %	End of semester exam (2 hours)
Resit Components	Final Assessment	Element weighting	Description
Practical Skills Assessment - Component B		50 %	Assessment of simulated practical work
Examination - Component A	✓	50 %	Exam (2 hours)

STUDENT AND ACADEMIC SERVICES

<b>Part 4: Teaching and Learning Methods</b>																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th style="text-align: left;"><b>Module Learning Outcomes</b></th> <th style="text-align: left;"><b>Reference</b></th> </tr> </thead> <tbody> <tr> <td>Understand the principles and methods used in control engineering across disciplinary boundaries</td> <td>MO1</td> </tr> <tr> <td>Demonstrate an understanding and knowledge of the key mathematical principles needed to properly analyse control systems</td> <td>MO2</td> </tr> <tr> <td>Apply and integrate knowledge from other engineering disciplines</td> <td>MO3</td> </tr> <tr> <td>Classify, identify and describe the performance of systems using analytical methods and modelling tools</td> <td>MO4</td> </tr> <tr> <td>Demonstrate the ability to apply appropriate theoretical and practical methods to the analysis and solution of control engineering problems</td> <td>MO5</td> </tr> <tr> <td>Show cognitive skills with respect to modelling and simplifying real problems, and applying mathematical methods of analysis</td> <td>MO6</td> </tr> <tr> <td>Demonstrate skills in problem formulation and decision making, interpreting experimental results</td> <td>MO7</td> </tr> </tbody> </table>	<b>Module Learning Outcomes</b>	<b>Reference</b>	Understand the principles and methods used in control engineering across disciplinary boundaries	MO1	Demonstrate an understanding and knowledge of the key mathematical principles needed to properly analyse control systems	MO2	Apply and integrate knowledge from other engineering disciplines	MO3	Classify, identify and describe the performance of systems using analytical methods and modelling tools	MO4	Demonstrate the ability to apply appropriate theoretical and practical methods to the analysis and solution of control engineering problems	MO5	Show cognitive skills with respect to modelling and simplifying real problems, and applying mathematical methods of analysis	MO6	Demonstrate skills in problem formulation and decision making, interpreting experimental results	MO7
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Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p><a href="https://uwe.rl.talis.com/modules/ufmfv7-15-2.html">https://uwe.rl.talis.com/modules/ufmfv7-15-2.html</a></p>																

## STUDENT AND ACADEMIC SERVICES

### Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Electrical and Electronic Engineering {Top-Up} [Oct][FT][AustonSingapore][1yr] BEng (Hons) 2019-20  
Electrical and Electronic Engineering {Top-Up} [Feb][FT][AustonSingapore][1yr] 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} [May][FT][AustonSingapore][1yr] 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  
Electrical and Electronic Engineering {Top-Up} [Oct][FT][AustonSriLanka][1yr] 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} [Feb][FT][AustonSriLanka][1yr] 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} [May][FT][AustonSriLanka][1yr] BEng (Hons) 2019-20  
Electrical and Electronic Engineering {Top-Up} [May][PT][AustonSriLanka][1.3yrs] BEng (Hons) 2019-20  
Electronic Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19  
Robotics [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19  
Electrical and Electronic Engineering [Sep][SW][Northshore][5yrs] MEng 2018-19  
Robotics [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19  
Electrical and Electronic Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19  
Electronic Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19  
Electronic Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19  
Electronic Engineering [Sep][SW][Frenchay][4yrs] 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 {Top Up} [Aug][FT][SHAPE][1yr] BEng (Hons) 2018-19  
Electronic and Computer Engineering {Top Up} [Aug][PT][SHAPE][2yrs] 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