



MODULE SPECIFICATION

Part 1: Information			
Module Title	Integrated Electro-Mechanical Systems		
Module Code	UFMFSL-15-3	Level	Level 6
For implementation from	2018-19		
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		
Contributes towards	Mechanical Engineering [Sep][FT][Frenchay][1yr] MSc 2018-19 Mechanical Engineering [Sep][PT][Frenchay][2yrs] MSc 2018-19		
Module type:	Standard		
Pre-requisites	Design and Electromechanical Systems 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Overview: This course teaches the design of mechatronic systems which integrate mechanical, electrical, and control systems engineering. There are significant laboratory-based design experiences.</p> <p>Educational Aims: See Learning Outcomes</p> <p>Outline Syllabus: Topics covered in the course may include but not be limited to the followings:</p> <p>Controls Review and Introduction to LabVIEW programming on the myRIO; - Low-level interfacing of software with hardware;</p> <p>Use of high-level graphical programming tools to implement real-time computation tasks;</p>

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Digital logic;

Analog interfacing and power amplifiers;

Measurement and sensing;

Electromagnetic and optical transducers;

Control of mechatronic systems

Teaching and Learning Methods: This module is supported by computer practical sessions. Study time outside of contact hours will be spent on worked exercises and example problems.

Scheduled learning includes lectures, and tutorials to familiarise the learners with computer software.

Independent learning includes hours engaged with essential reading, software, group project preparation and completion etc. These sessions constitute an average time per level as indicated in the table below.

Contact Hours:

There are a total of 36 scheduled contact hours for lecturing and tutorials

Lectures/tutorials: 36 hours

Self-directed learning : 60 hours

Group Project: 53 hours

Exam preparation: 25 hours

Total hours : 150

Part 3: Assessment

The module is examined through two components of assessment to create a balanced assessment that covers underpinning concepts and applications of the material covered.

A two hour written examination in order to test understanding of theory and knowledge of electromechanical systems under controlled conditions.

During the module, students are introduced to a series of practical scenarios that develop their ability to apply concepts of modelling and simulation to the design and validation of electromechanical systems. The coursework assessment is a group based activity (group size 4 or 5 students) resulting in a 20 page technical report where typically four scenarios will be considered. A template will be provided to help students develop their writing style.

Within each scenario students will be required to demonstrate their knowledge of using modelling software packages, and their ability to critically evaluate and analyse results of the structural model.

Each student will submit a 250 word reflection summarising their understanding of the conclusions to be drawn from the investigations.

The referred component B assessment will involve a new task resulting in an 8 page individual technical report that will include a 300 word reflection on the management and operation of a team charged with the task of completing an engineering design project.

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First Sit Components	Final Assessment	Element weighting	Description
Report - Component B		75 %	Group report (portfolio of four scenarios)
Examination - Component A	✓	25 %	Examination
Resit Components	Final Assessment	Element weighting	Description
Report - Component B		75 %	Individual report
Examination - Component A	✓	25 %	Examination

Part 4: Teaching and Learning Methods		
Learning Outcomes	On successful completion of this module students will be able to:	
	Module Learning Outcomes	
	MO1 Formulate test procedures for performance measurement of mechatronic systems	
	MO2 Create an integrated design involving actuators, mechanical elements, control elements and software for the efficient performance of specific Mechatronic systems	
	MO3 Select sensors based on an understanding of their key characteristics	
	MO4 Use the modelling skills acquired in this module to investigate mechatronic systems	
	MO5 Identify constraints that impact on the design and operation of a mechatronic system including environmental and sustainability limitations, health and safety and risk assessment issues	
	MO6 Design and Implement an Electromechanical Solution within a team	
Contact Hours	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

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	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/ufmfsl-15-3.html</p>	