MODULE SPECIFICATION

Part 1: Information			
Module Title	Advanced Mechatronics		
Module Code	UFMFTL-15-M	Level	Level 7
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			
Module type:	Standard		
Pre-requisites	Integrated Electro-Mechanical Systems 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
Overview: This course is an introduction to the modelling of mechatronic systems, which require integration of the mechanical and electrical engineering disciplines within a unified framework applied to real industrial applications. **Educational Aims:** There are significant laboratory-based design experiences wherein the design theory, experimentation basics, integration principles will be taught. **Outline Syllabus:** In this course, the topics covered principally systems modelling and control and may include but not be limited to the followings: Using the myRIO with LabVIEW to implement closed-loop control Open/Close loop control Controllers PC and PLC and Embedded

Software for control

Languages and Platforms

Real-time Control

Analog Feedback Systems

Electronic Scale

Brushless Motor Control

Examples of mechatronic systems may include: Robots, Machine tools, Car Engine management system, etc.

Teaching and Learning Methods: See Assessment

Part 3: Assessment
The module is examined through work in groups to develop their knowledge and understanding of the engineering process - i.e. analysis of problem, conceptualisation of a solution and its iteration, simulation and proof-of-concept testing - in order to test ability of students to work in teams, as well as via a coursework element designed to assess the students' abilities in using modelling software packages, and their competencies in critically evaluating and analysing results from modelling and simulation. The industrial project (Component B) will be assessed through a group report where they submit a portfolio of their design work. The group presentation (Component A) will give them a real-engineering problem solving experience as they will be working in teams on an industrial problem provided by industrial partners and will be individually assessed through a questioning session. Component A: A technical oral (group) presentation to assess how students implement their understanding and knowledge of the fundamentals of integrated electromechanical systems and mechatronics. They will explain their approach to simulate real systems and their experimental results to finding solutions to real-world industrial problems (PBL). Following the group presentation, there will be an individual questioning session where the teaching team will ask questions to evaluate fundamental knowledge and assess the contribution of every student in the group. The overall oral presentation (presentation and questioning session) will last for a maximum of 45 minutes. Component B: Depending on the industrial problems plotted, the design project will include but not be limited to the followings: (i) a 3D CAD model of an engineering system, (ii) 2D component drawings, (iii) appropriate software, (iv) implementation and validation of the proposed solution through the use of relevant hardware to evaluate full comprehension of the syllabus and learning outcomes. This will be assessed using the standard group assessment strategy. Resit Strategy: The resit strategy will be to provide the group of students, or individuals, with the opportunity to rework the project carried out in the first sit in order to demonstrate that they have achieved all of the learning outcomes. Component A will be assessed via a presentation and individual questioning and Component B will be assessed by an individual coursework.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Group coursework (Report) 40 pages
Presentation - Component A	✓	50 %	Group presentation and individual questioning
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Individual coursework (Report) - 20 pages
Presentation - Component A	✓	50 %	Presentation and individual questioning

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	Extract information from data sheets that describe hardware.
MO2	Demonstrate a thorough understanding of how microprocessor systems work.
MO3	Enumerate the components of complex Mechatronics Systems.
MO4	Produce a technical analysis of a Mechatronic System.
MO5	Develop and implement an Embedded Mechatronic controller.
MO6	Demonstrate knowledge of programming, digital electronics and microprocessors or controlled systems in the design of advanced mechatronic systems.
MO7	Develop innovative solutions to automation problems that arise in advanced manufacturing.

Contact Hours

Contact Hours	
Independent Study Hours:	
Independent study/self-guided study	108
Total Independent Study Hours:	108
Scheduled Learning and Teaching Hours:	
Face-to-face learning	42
Total Scheduled Learning and Teaching Hours:	42

	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/index.html	