MODULE SPECIFICATION

Part 1: Information			
Module Title	Electromechanical Systems Integration		
Module Code	UFMEEA-15-M	Level	Level 7
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	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: This course teaches the design of electromechanical and mechatronic systems that integrate mechanical, electrical, and control systems engineering.

The module covers advanced modelling, design and development cycle of electromechanical and mechatronic solutions to engineering problems. The module is lab-based with students working in small groups on problems that originate from an industrial application or a research problem from the robotics or mechatronics research carried out within the Department.

Examples may include:
Robots and Machine tools; Car Engine management system; Aircraft actuators from fly by wire.

Educational Aims: The aim of this module is to equip students with advanced technical knowledge and practical experiences of the design of electromechanical and mechatronic systems and industrial applications.

Outline Syllabus: The syllabus may include but not be limited to the following:

MECHANICAL ELEMENTS:
Acceleration, Velocity, Torque, Inertia; Mechanical transmission; Gearboxes, pulley, belt and chains; Linear and Rotary bearings; Machine screws and Splined shafts.

SYSTEMS INTEGRATION:
Rotary and linear electric motors, gearboxes ,shafts integration.

SYSTEMS MODELLING and CONTROL:
Open, close loop control; Novel controllers; System performance measures; Controllers PC and PLC and Embedded; Software for control, Languages and Platforms.

Teaching and Learning Methods: A combination of formal lectures, presentations and laboratory sessions will be used as the teaching approach. It is expected that the student will carry out independent study outside the formal sessions.

Scheduled learning includes lectures and laboratory practical sessions.

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

Part 3: Assessment

Component A:
The two-hour end of semester exam is used to test undelying concepts and principles

Component B:
The written assignments based on laboratory work are to assess student's ability to model and analyse the characteristics of real systems from real time observations. More over it is expected that the student can provide detailed and cogent arguments about their findings and conclusions. The written assignment submission will be made up of 3 mini reports of 1000 words each.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A	✓	50 %	Online Exam (Final assessment)
Written Assignment - Component B		50 %	Individual Written Assignment
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A	✓	50 %	Online Exam (Final assessment)
Written Assignment - Component B		50 %	Individual written assignment (3000 words)

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
Develop and apply mathematical and computer aided models for the solution and investigation of complex electromechanical and mechatronics systems	MO1
Critically evaluate the fitness for purpose of complex mechatronic systems and propose test procedures for simple systems	MO2
Select and integrate actuators, mechanical elements, control elements and software to perform specific tasks efficiently	MO3
Accurately describe the characterising attributes of a mechatronics system	MO4
Describe and explain in detail the specific issues related to the integration of mechanical, electronic and software elements	MO5

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Laboratory work	24
Lectures	12
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://rl.talis.com/3/uwe/lists/ED45306D-5DBE-B1B3-411F-4C027819EEFF.html?lang=en-US

Part 5: Contributes Towards

This module contributes towards the following programmes of study: