MODULE SPECIFICATION

Part 1: Information			
Module Title	Systems Design		
Module Code	UFMFUS-15-2	Level	Level 5
For implementation from	2021-22		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engineering, Design & Mathematics		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: In this module students are introduced to the multidisciplinary challenges present in engineering designs that include electromechanical systems in designs and to develop an appreciation of 'TOTAL DESIGN' as a design philosophy.

The key outcome will be the understanding of techniques for product realisation that address the optimal integration of mechanical, electronic and software engineering to produce products or processes against a given set of client and socio-economic requirements.

Educational Aims: This module provides a systematic approach to the design of electro-mechanical systems and develops the students 'systems design thinking'.

Outline Syllabus: Syllabus

Design and realisation of electromechanical systems:

This section examines areas related to the engineering design activity, user requirements, design specification, concept design and selection, product life cycle management, sustainability, design of integrated electromechanical systems and software interfacing, introduction to design optimisation.

Design and application of machine elements:

This section is concerned with the design, selection, application and specification of bought-out components and equipment based of cost, risk & reliability and ethical considerations.

Application of electromechanical elements: This section is concerned with power sources, microcontrollers and their peripherals, sensors and signals, actuators, motors and their control, interfacing, transformers, basic closed loop control. There integration to form electromechanical systems.

Teaching and Learning Methods: Material will be delivered in whole cohort sessions supported by on-line resources. The majority of the learning activity will take place in group-based workshops working on the mechatronic design tasks.

Part 3: Assessment

The students will work in groups on design activities that will lead to the solution to a mechatronic problem. A question and answer session will be used to determine what the students know and the depth of understanding of the justifications and implementation of potential technical aspects of the project

Component A

Group Executive Briefing, for a group mark, to discuss how the final design solution was planned, conducted, reflecting how the engineers have connected with the groups involved in reaching the client's needs. This will be a briefing with a Question and Answer session taking around 20 minutes.

The group work mark will be moderated using the EDM Group Working Policy.

Component B

The students are required to produce an INDIVIDUAL written assignment submitted at the end of the module. The assignment is designed to assess the students' design theory, technical understanding and application of the various electromechanical devices, integrations and the selection criteria and process in manifesting a solution for a given customer. (Maximum 2000 words + computer-aided design and analysis documents.

Resit Strategy

Component A: Requires the student to give an individual briefing based on a tutor-specified scenario.

Component B: Provides the student with the opportunity to rework the final report (2000 words)

Risk of plagiarism will be mitigated by the individualised variables and data being issued to student groups with the assignment brief.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Presentation - Component A	✓	40 %	Group briefing (20 minutes total – 8 minute presentation, 12 minutes Q&A)
Report - Component B		60 %	Individual report (2000 words) + supportive documentation
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Presentation - Component A	✓	40 %	12 minute Individual Briefing
Report - Component B		60 %	Industrially-focussed report (maximum 2000 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
Investigate and define a design problem, identify and negotiate constrains including environmental and sustainability limitations, health and safety, cost and risk assessment issues. (EL1, EL4, D2, D3b, P8)	MO1
Develop a feasible computer aided design solution with detailed documentation for a simplified electromechanical system (D3b)	MO2
Identify and create computer-aided models that describe simple electro mechanical systems (SM1b, EA1b)	MO3
Select and evaluate electromechanical components within a design activity, based on an understanding of their characteristics (EA1b, SM2b, EA3b)	MO4

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://rl.talis.com/3/uwe/lists/CD0366C8-E463-7E85-AD87-304357390246.html?draft=1&lang=en-GB&login=1

Part 5: Contributes Towards

This module contributes towards the following programmes of study: