STUDENT AND ACADEMIC SERVICES

UWE Bristol | University of the West of England

MODULE SPECIFICATION

Part 1: Information			
Module Title	Mechatronics		
Module Code	UFMFR9-15-2	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	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: The primary aim of this module is to enable the student to appreciate Mechatronics as a design philosophy with the objective of optimal integration of Mechanical, Electronics and Software Engineering to produce superior products, processes or systems.

Educational Aims: See Learning Outcomes.

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.

SENSORS and SENSOR CHARACTERISTICS: Linearity, repeatability, resolution etc. for a range of sensors and principle of operation of various sensors.

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

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

Teaching and Learning Methods: Large group lecture, study time outside of contact hours will be spent on going through exercises and example problems and laboratory tasks.

Lab sessions (small groups) will provide experience of real systems with their nonlinearity's and will require further non-contact time or assignment preparation.

Scheduled learning includes lectures, lab sessions.

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

Contact: 36 hours
Assimilation and skill development: 63 hours
Coursework: 17 hours
Exam preparation: 34 hours
Total: 150 hours

Part 3: Assessment

Assessed via end of semester Exam (2 hours, 50%) to assess the students understanding of concepts and techniques. Also laboratory Course Work assessment based on practical work carrying an equal weighting (50%) to encourage engagement, focus and demonstrate the challenges of integration outside idealised theoretical framework.

First Sit Components	Final Assessment	Element weighting	Description
Practical Skills Assessment - Component B		50 %	Assessment for practical work and laboratory project
Examination - Component A	✓	50 %	Exam (2 hours)
Resit Components	Final Assessment	Element weighting	Description
Practical Skills Assessment - Component B		50 %	Assessment for practical work and laboratory project
Examination - Component A	✓	50 %	Exam (2 hours)

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
Ability to apply quantitative methods and computer software relevant to Mechatronic systems and solve Mechatronic system problems	MO1
Identifying and Creating mathematical and computer aided models for simple mechatronics systems	MO2
Formulating test procedures for performance measurement of mechatronic systems	MO3
Selection of actuators, mechanical elements, control elements and software for the efficient performance of specific Mechatronic systems	MO4

	Selection of sensors based on an understanding of their key characteristics	MO5
	Investigate and define a problem and identify constrains including environmental and sustainability limitations, health and safety and risk assessment issues. Use the modelling skills acquired in this module for investigation of mechatronic systems	MO6
	Propose a Mechatronics solution for a simple electromechanical system	MO7

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://uwe.rl.talis.com/modules/ufmfr9-15-2.html	

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Aerospace Engineering (Systems) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering (Manufacturing) [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering (Systems) [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering (Manufacturing) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering (Manufacturing) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering (Manufacturing) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][SW][Frenchay][5yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies (Systems) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19

Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19