



MODULE SPECIFICATION

Part 1: Information			
Module Title	Introduction to Mechatronics		
Module Code	UFMFCG-15-0	Level	Level 3
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	<p>Robotics {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Robotics {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Mechanical Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng 2018-19</p> <p>Mechanical Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng 2018-19</p> <p>Mechanical Engineering {Foundation} [Sep][FT][Frenchay][5yrs] MEng 2018-19</p> <p>Mechanical Engineering {Foundation} [Sep][SW][Frenchay][6yrs] MEng 2018-19</p> <p>Automotive Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Automotive Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Automotive Engineering {Foundation} [Sep][FT][Frenchay][5yrs] MEng 2018-19</p> <p>Automotive Engineering {Foundation} [Sep][SW][Frenchay][6yrs] MEng 2018-19</p> <p>Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies (Design) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies (Design) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies (Manufacturing) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies (Systems) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19</p> <p>Aerospace Engineering with Pilot Studies (Manufacturing) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19</p>		

STUDENT AND ACADEMIC SERVICES

	Aerospace Engineering with Pilot Studies (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 Aerospace Engineering (Design) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19 Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19 Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19 Aerospace Engineering (Manufacturing) {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19	
Module type:	Standard	
Pre-requisites	None	
Excluded Combinations	None	
Co- requisites	None	
Module Entry requirements	None	

Part 2: Description

Educational Aims: See Learning Outcomes

Outline Syllabus: Mechanical elements:

Bearings, gears, gearboxes, pulleys, belts, chains, transmission systems, pneumatic actuators.

Electrical elements:

Switches, motors, relays, pumps, proximity sensors, solenoids, solenoid valves, proportional valves.

Electrical/electronic principles:

Electrical current and voltage. Alternating and direct current systems. Properties of resistors, capacitors and inductors.

Fundamentals of analogue electronics:

Diodes, transistors. Simple transistor amplifiers. Operational amplifiers. Level detection and switching. Photo-detection devices. LEDs.

Fundamentals of digital electronics:

Digital information and its representation. Logic gates and systems. Binary and hexadecimal notation. Structure of simple microcontrollers. Microcontroller programming methods, flowcharts.

Sensing technology electronics:

Temperature sensing, contact and non-contact proximity sensing, linear and rotary distance measurement, liquid level detection, magnetic field detection.

Teaching and Learning Methods: Scheduled learning includes lectures with tutorial sessions, practical classes and workshops.

Independent learning includes hours engaged in problem solving and preparation of tutorial questions and assignment preparation.

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Part 3: Assessment			
<p>Component A, a two hour end of module unseen written examination to test the understanding and knowledge of the fundamentals of mechatronics under controlled conditions.</p> <p>Component B, assessment is made up of:</p> <p>A written assignment. The assessment aims to determine the student's ability to implement and reflect upon the skills and theory learnt. A mix of general and individual written feedback will be provided.</p> <p>Three group presentations will be used to assess the effectiveness and efficiency of the group and individuals to explain mechatronics principle and practise. The group presentations will be held in-class and the same mark will be allocated to all members of the same group provided they have engaged with the preparation and presentation. If a student does not participate then they will not be awarded a mark for the presentation.</p>			
First Sit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		38 %	Coursework assessment (No set word length as open questions based assignment).
Presentation - Component B		12 %	3 x Group presentations Approximately 10 minutes long, group presentation. One mark allocated for all members of the same group provided they have engaged with the process.
Examination - Component A	✓	50 %	Examination (2 hours)
Resit Components	Final Assessment	Element weighting	Description
Written Assignment - Component B		50 %	Coursework assessment (No set word length as open questions based assignment).
Examination - Component A	✓	50 %	Examination (2 hours)

Part 4: Teaching and Learning Methods													
Learning Outcomes	On successful completion of this module students will be able to:												
	<table border="1"> <thead> <tr> <th></th> <th>Module Learning Outcomes</th> </tr> </thead> <tbody> <tr> <td>MO1</td> <td>Construct a basic electronic circuit demonstrating understanding of both fundamental analogue and digital electronics (for filters, amplifiers, and other signal conditioning circuits)</td> </tr> <tr> <td>MO2</td> <td>Demonstrate an understanding of the function and constitution of common electronic, mechanical and electro-mechanical actuators with their importance in mechatronic systems.</td> </tr> <tr> <td>MO3</td> <td>Describe how various types of analogue and digital sensors and instruments work and how they are applied in engineering with their importance.</td> </tr> <tr> <td>MO4</td> <td>Understand and explain the issues related to the integration of mechanical, electronic and software constituents into products and systems.</td> </tr> <tr> <td>MO5</td> <td>Develop communication and self-management skills</td> </tr> </tbody> </table>		Module Learning Outcomes	MO1	Construct a basic electronic circuit demonstrating understanding of both fundamental analogue and digital electronics (for filters, amplifiers, and other signal conditioning circuits)	MO2	Demonstrate an understanding of the function and constitution of common electronic, mechanical and electro-mechanical actuators with their importance in mechatronic systems.	MO3	Describe how various types of analogue and digital sensors and instruments work and how they are applied in engineering with their importance.	MO4	Understand and explain the issues related to the integration of mechanical, electronic and software constituents into products and systems.	MO5	Develop communication and self-management skills
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STUDENT AND ACADEMIC SERVICES

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
	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/ufmfcg-15-0.html</p>	