



## **Module Specification**

### Introduction to Mechatronics

Version: 2021-22, v2.0, 16 Sep 2021

#### **Contents**

|  |          |
|--|----------|
| <b>Module Specification .....</b>                  | <b>1</b> |
| <b>Part 1: Information .....</b>                   | <b>2</b> |
| <b>Part 2: Description .....</b>                   | <b>2</b> |
| <b>Part 3: Teaching and learning methods .....</b> | <b>3</b> |
| <b>Part 4: Assessment.....</b>                     | <b>4</b> |
| <b>Part 5: Contributes towards .....</b>           | <b>6</b> |

## Part 1: Information

**Module title:** Introduction to Mechatronics

**Module code:** UFMFCG-15-0

**Level:** Level 3

**For implementation from:** 2021-22

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Engineering Design & Mathematics

**Partner institutions:** None

**Delivery locations:** Frenchay Campus

**Field:** Engineering, Design and Mathematics

**Module type:** Standard

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** Not applicable

**Features:** Not applicable

**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.

### **Part 3: Teaching and learning methods**

**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.

**Module Learning outcomes:** On successful completion of this module students will achieve the following 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

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmfcg-15-0.html) via the following link <https://uwe.rl.talis.com/modules/ufmfcg-15-0.html>

## Part 4: Assessment

**Assessment strategy:** Component A, a two hour end of module written examination to test the understanding and knowledge of the fundamentals of mechatronics under controlled conditions.

Component B, assessment is made up of:

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.

**Assessment components:**

**Examination (Online) - Component A (First Sit)**

Description: Online Examination: 4 hours

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

**Written Assignment - Component B (First Sit)**

Description: Coursework assessment

(No set word length as open questions based assignment).

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO5

**Examination (Online) - Component A (Resit)**

Description: Online Examination: 4 hours

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5

**Written Assignment - Component B (Resit)**

Description: Coursework assessment

(No set word length as open questions based assignment).

Weighting: 50 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO5

## Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechanical Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Mechanical Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Automotive Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Automotive Engineering {Foundation}[Sep][FT][Frenchay][5yrs] BEng (Hons) 2021-22

Electronic Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Electronic Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Robotics {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Robotics {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BSc (Hons) 2021-22

Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BSc (Hons) 2021-22

Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Civil Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Civil Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22