



## **Module Specification**

### **Introduction to Mechatronics**

Version: 2022-23, v4.0, 20 Jul 2022

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## Part 1: Information

**Module title:** Introduction to Mechatronics

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

**Level:** Level 3

**For implementation from:** 2022-23

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

Electrical elements and principles:

Switches, motors, relays, pumps, proximity sensors, solenoids, solenoid valves, proportional valves, electrical current and voltage, alternating and direct current systems, properties of resistors, capacitors and inductors.

Sensing technology electronics:

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

Fundamentals of programming language:

Scratch and Python.

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.

### **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 and program a basic embedded system demonstrating understanding of both fundamental of mechatronics (interfacing electrical, mechanical and control engineering)

**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 actuators, 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 series of E-quizzes to test the understanding and knowledge of the fundamentals of mechatronics (25%).

Component B

A group presentation (30min). The assessment aims to determine the student's ability to implement and reflect upon the skills and theory learnt. To ensure an inclusive curriculum, students may opt to submit an alternative individual presentation (10 min) in-place of the group presentation after completing the group work activity in groups (50%).

A video of the group's solution to the design task. To ensure an inclusive curriculum, students may opt to undertake the alternative individual assessment (individual video submission) in-place of the group video after completing the group work activity in

groups (25%).

The resit assessment profile is the same as the first sit.

**Assessment components:**

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

Description: Series of e-quizzes

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3

**Presentation - Component B (First Sit)**

Description: Group presentation (or an alternative individual assessment)

Weighting: 50 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO1, MO4, MO5

**Group work - Component B (First Sit)**

Description: Video of solution to the design task (or alternative individual)

Weighting: 25 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO1, MO4, MO5

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

Description: Series of E-quizzes

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3

**Presentation - Component B (Resit)**

Description: Individual presentation on design task

Weighting: 50 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO1, MO4, MO5

**Group work - Component B (Resit)**

Description: Video of solution to the design task

Weighting: 25 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO1, MO4, MO5

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons)  
2022-23

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Mechanical Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Civil Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2022-23

Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BSc (Hons) 2022-23

Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BSc (Hons) 2022-23

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2022-  
23

Mechanical Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2022-23

Mechanical Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2022-23

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2022-23

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2022-23

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2022-23

Automotive Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2022-23

Automotive Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2022-23

Electronic Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2022-23

Electronic Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2022-23

Robotics {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2022-23

Robotics {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2022-23

Civil and Environmental Engineering {Foundation} [Sep][FT][Frenchay][4yrs] - Not Running BEng (Hons) 2022-23

Civil and Environmental Engineering {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running BEng (Hons) 2022-23

Civil Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2022-23

Civil Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2022-23

Engineering {Foundation} [Frenchay] BSc (Hons) 2022-23

Robotics {Foundation} [Frenchay] BEng (Hons) 2022-23