



Module Specification

Introduction to Mechatronics

Version: 2023-24, v2.0, 06 Jul 2023

Contents

Module Specification	1
Part 1: Information	2
Part 2: Description	2
Part 3: Teaching and learning methods	3
Part 4: Assessment.....	4
Part 5: Contributes towards	6

Part 1: Information

Module title: Introduction to Mechatronics

Module code: UFMFCG-15-0

Level: Level 3

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

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: The assessment for this module is as follows:

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

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 tasks:

Online Assignment (First Sit)

Description: Series of e-quizzes

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3

Presentation (First Sit)

Description: Group presentation - Presentation lasts for 6 minutes followed by 24 minutes of questions.

Weighting: 50 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO1, MO4, MO5

Practical Skills Assessment (First Sit)

Description: Consists of four pieces of evidence collected from lab work.

1. Video of solution to the design task
2. Submission of code
3. Flow chart
4. Electrical circuit diagram

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO4, MO5

Online Assignment (Resit)

Description: Series of E-quizzes

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3

Presentation (Resit)

Description: Group presentation - Presentation lasts for 6 minutes followed by 24 minutes of questions.

Resit deliverable(s) will be scaled appropriately to group size and task complexity

Weighting: 50 %

Final assessment: No

Group work: Yes

Learning outcomes tested: MO1, MO4, MO5

Practical Skills Assessment (Resit)

Description: Consists of four pieces of evidence collected from lab work.

1. Video of solution to the design task
2. Submission of code
3. Flow chart
4. Electrical circuit diagram

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO4, MO5

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechatronics Engineering {Foundation} [Frenchay] MEng 2023-24

Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Engineering {Foundation} [Frenchay] BSc (Hons) 2023-24

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons)
2023-24

Civil Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Mechatronics Engineering {Foundation}[Frenchay] BEng (Hons) 2023-24

Electrical and Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2023-24

Robotics {Foundation} [Frenchay] BEng (Hons) 2023-24