



Module Specification

Introduction to Mechatronics

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Part 1: Information

Module title: Introduction to Mechatronics

Module code: UFMFCG-15-0

Level: Level 3

For implementation from: 2025-26

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Arts, Technology and Environment

School: CATE School of Engineering

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: Engineers should have an awareness of how individual components work together to perform more complex tasks. This introduction to mechatronics will enable students to develop skills culminating in an in-lab demonstration of a working device. This exciting module will provide our student engineers with hands-on experience working with electrical elements, sensors and the fundamentals of digital electronics.

Features: Not applicable

Educational aims: This module aims to equip students with the skills suitable to build a simple mechatronic system. By the end of the module, students will have developed a holistic approach to electro-mechanical systems. This is a skill set and problem-solving attribute that will be invaluable to any of our student engineers independent of their specific field.

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 components with their importance in mechatronic and applied engineering systems.

MO3 Understand and explain the issues related to the integration of mechanical, electronic and software constituents into products and systems.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

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 will be completed over the course of the semester to prepare students for final demonstration with formative throughout.

The students will demonstrate in-class the accumulation of the work carried out over the course of the module. This will include the code, flow-charts, schematic diagrams and a video showing the working mechatronic system. (100%).

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

Assessment tasks:**Practical Skills Assessment (First Sit)**

Description: Over the semester demonstrate evidence collected from lab work culminating an in-class demonstrator.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Practical Skills Assessment (Resit)

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

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electrical and Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Electrical and Electronic Engineering {Foundation} [GCET] BEng (Hons) 2025-26

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons) 2025-26

Civil Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Mechanical Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Engineering {Foundation} [Frenchay] BSc (Hons) 2025-26

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Mechatronics Engineering {Foundation} [Frenchay] MEng 2025-26

Mechatronics Engineering {Foundation}[Frenchay] BEng (Hons) 2025-26

Robotics {Foundation} [Frenchay] BEng (Hons) 2025-26

Electrical and Electronic Engineering {Foundation} [GCET] DipHE 2025-26

Electrical and Electronic Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Robotics {Foundation} [Frenchay] BEng (Hons) 2025-26

Civil Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Automotive Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Aerospace Engineering with Pilot Studies {Foundation} [Frenchay] BEng (Hons)
2025-26

Mechanical Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26

Mechatronics Engineering {Foundation} [Frenchay] MEng 2025-26

Aerospace Engineering {Foundation} [Frenchay] BEng (Hons) 2025-26