Module Specification

Integrated Electro-Mechanical Systems

Version: 2026-27, v4.0, Approved

Contents

Part 1: Information

Module title: Integrated Electro-Mechanical Systems

Module code: UFMFSL-15-3

Level: Level 6

For implementation from: 2026-27

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: This course teaches the design of mechatronic systems which integrate mechanical, electrical, and control systems engineering.

The approach is problem led with majority of the learning being achieved by working in small groups on design tasks that require the integration of disciplines that are required when considering mechatronic systems. To ensure active engagement in the material the module is designed to provide significant laboratory-based design

experiences and the consideration of real engineering problems.

The module provides an opportunity for students who wish to learn through laboratory based project work in a small collaborative design team and so helps students understand the role of an engineer working in such an environment.

Features: Not applicable

Educational aims: This module is designed to demonstrate the necessity to integrate different engineering and technical disciplines in the solution of a systems based problem, taking mechatronics as the vehicle for applying problem based skills to real engineering problems.

Outline syllabus: Topics covered in the course may include but not be limited to the followings:

Controls Review and Introduction to LabVIEW programming on the myRIO;

Low-level interfacing of software with hardware;

Use of high-level graphical programming tools to implement real-time computation tasks;

Digital logic;

Analog interfacing and power amplifiers;

Measurement and sensing;

Electromagnetic and optical transducers;

Control of mechatronic systems.

Part 3: Teaching and learning methods

Teaching and learning methods: The module delivery is designed for students to engage with a series of practical design tasks and demonstrate their problem solving skills.

Lectures are used to set the scene and relevance of the underlying theory and design tasks. The majority of the active learning takes place in tutorials and computer-based practical sessions.

Independent learning includes hours engaged with essential reading, software, group project preparation and completion, etc.

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

MO1 Design and implement an integrated electromechanical system to meet defined requirements, demonstrating practical application of mechatronic principles across hardware and software components.

MO2 Critically model and evaluate the performance, constraints, and operational integrity of a mechatronic system, incorporating considerations of environmental sustainability, health and safety, and risk management.

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 via the following link https://uwe.rl.talis.com/modules/ufmfsl-15-3.html

Part 4: Assessment

Assessment strategy: Assessment Strategy:

The assessment strategy is designed to foster continuous learning and engagement while ensuring structured evidence of student progress throughout the module. Assessment is aligned with the revised module learning outcomes and includes weekly feedback cycles, practical development, and reflection.

Weekly Practical Deliverables & Continuous Assessment (100%)

Students work in assigned groups (typically 2–3 students) on a defined set of mechatronic requirements over a 9-week period.

Each week, students are expected to:

Complete a specific design and implementation task (aligned with a requirement).

Record a descriptive video (max. 5 mins) demonstrating and explaining their technical progress.

Submit a mini-report (1–2 pages) summarising the work completed, problems encountered, solutions developed, and planned next steps.

All submissions must be uploaded to Blackboard weekly. Timely submission is mandatory and non-submission will result in a mark of zero for that week, unless mitigating circumstances apply.

Students will receive weekly feedback with an indicative mark. This mark is provisional and subject to moderation. Feedback will focus on both technical quality and clarity of communication.

Final mark breakdown 90% and 10% peer review.

Assessment Justification
This structure:

Encourages regular engagement and effort,

Provides consistent feedback to support learning and improvement,

Ensures academic integrity and verifiable progress,

Allows moderation and transparency through stored submissions.

Resit Strategy:

Resit is the same as the first sit

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

Assessment tasks:

Report (First Sit)
Description: Weekly Group presentation and mini-report (24 pages)
Weighting: 100 %
Final assessment: Yes
Group work: Yes
Learning outcomes tested: MO1, MO2

Report (Resit)
Description: Weekly Group presentation and mini-report (24 pages)

Resit deliverable(s) will be scaled appropriately to group size and task complexity
Weighting: 100 %
Final assessment: Yes
Group work: Yes
Learning outcomes tested: MO1, MO2

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electro-mechanical Engineering {Apprenticeship-UCW}[UCW] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2023-24

Mechanical Engineering with Manufacturing {Apprenticeship-UWE} [UCW] BEng (Hons) 2023-24

Electro-mechanical Engineering {Apprenticeship-UCW}[UCW] BEng (Hons) 2024-25

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2024-25

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2023-24

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2024-25

Aeronautical Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2024-25

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET] BEng (Hons) 2022-23

Mechanical Engineering and Technology (Mechatronics) {Foundation} [GCET] BEng (Hons) 2022-23

Aerospace Engineering {Apprenticeship-UCW} [UCW] - WITHDRAWN BEng (Hons) 2024-25

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering and Technology (Mechatronics) {Foundation} [GCET] BEng (Hons) 2023-24

Aeronautical Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2024-25

Aerospace Engineering {Apprenticeship-UWE} [UCW] BEng (Hons) 2024-25

Electro-mechanical Engineering (Nuclear) {Apprenticeship-UCW}{Top-Up}[Frenchay] BEng (Hons) 2026-27

Electro-mechanical Engineering {Apprenticeship-UCW}{Top-Up}[Frenchay] BEng (Hons) 2026-27

Mechanical Engineering (Mechatronics) [BIET] BEng (Hons) 2025-26

Mechanical Engineering (Mechatronics) [BIET] BEng (Hons) 2026-27

Mechanical Engineering and Technology (Mechatronics) {Foundation} [GCET] BEng (Hons) 2023-24

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET] BEng (Hons) 2023-24

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

Mechanical Engineering [Frenchay] BEng (Hons) 2023-24

Mechanical Engineering [Frenchay] BEng (Hons) 2023-24

Mechanical Engineering [Frenchay] MEng 2023-24

Mechanical Engineering [Frenchay] MEng 2023-24

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

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

Automotive Engineering [Frenchay] MEng 2023-24

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

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

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2023-24

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

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

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

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

Aerospace Engineering [Frenchay] MEng 2023-24

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

Mechatronics Engineering [Frenchay] MEng 2024-25

Aerospace Engineering [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering [Frenchay] MEng 2024-25

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2024-25

Mechanical Engineering [Frenchay] BEng (Hons) 2024-25

Mechanical Engineering [Frenchay] MEng 2024-25

Automotive Engineering [Frenchay] BEng (Hons) 2024-25

Automotive Engineering [Frenchay] MEng 2024-25

Mechatronics Engineering [Frenchay] BEng (Hons) 2024-25

Automotive Engineering [Frenchay] MEng 2023-24

Automotive Engineering [Frenchay] - WITHDRAWN MEng 2024-25

Aerospace Engineering [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] MEng 2024-25

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

Automotive Engineering [Frenchay] BEng (Hons) 2024-25

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

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

Aerospace Engineering [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering {Apprenticeship-UCW} [UCW] BEng (Hons) 2023-24

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

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

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2024-25

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2024-25

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

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2022-23

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2023-24

Mechatronics Engineering [Frenchay] MEng 2024-25

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

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

Mechatronics Engineering [Frenchay] BEng (Hons) 2024-25

Mechanical Engineering {Apprenticeship-UCS} {Top-Up} [Frenchay] BEng (Hons) 2025-26

Mechanical Engineering {Apprenticeship-UCW} {Top-Up} [Frenchay] BEng (Hons) 2025-26

Mechanical Engineering {Apprenticeship-GlosColl} {Top-Up} [Frenchay] BEng (Hons) 2025-26

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2023-24

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2024-25

Aerospace Engineering [Frenchay] MEng 2023-24

Aerospace Engineering [Frenchay] MEng 2024-25

Mechanical Engineering [Frenchay] MEng 2023-24

Mechanical Engineering [Frenchay] MEng 2023-24

Mechanical Engineering [Frenchay] MEng 2024-25

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

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

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

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

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2023-24