



Module Specification

Electromechanical Systems Engineering

Version: 2026-27, v2.0, Approved

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Part 1: Information

Module title: Electromechanical Systems Engineering

Module code: UFMFQP-30-1

Level: Level 4

For implementation from: 2026-27

UWE credit rating: 30

ECTS credit rating: 15

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 module introduces the core principles and practices of electromechanical systems engineering. Students will develop analytical skills in electrics and electronics, explore systems engineering and management methods, and gain hands-on experience with measurement and instrumentation .

Mathematical tools such as complex numbers, matrix, vector algebra, differential calculus and Laplace transforms are applied throughout, with MATLAB® used for modelling and simulation

Features: Not applicable

Educational aims: To equip students with the theoretical foundations of electromechanical sub-systems, including circuit principles, magnetics and power electronics.

To develop proficiency in analytical techniques for circuit and systems modelling, employing mathematical tools such as complex numbers, matrix algebra and Laplace transforms.

To foster practical skills in industrial measurement and instrumentation methods for temperature, pressure, flow and dynamic-response testing.

Outline syllabus: Topics covered include, but are not limited to:

Electrics and Electronics:

Circuit Components

Kirchhoff's Laws

Thevenin's and Norton's Theories

Inductive Circuits

Electromechanical Systems:

Systems Engineering

Systems Management

Systems Modelling

Measurement & Instrumentation:

Measurement

Temperature Instruments

Pressure & Flow Instruments

Electromechanical

Dynamic Response

In this module the following mathematical topics will be introduced and developed:

Complex Numbers

Matrix and Vector Algebra

Differential Calculus

Laplace Transform

Using MATLAB®

Programming Structures

Part 3: Teaching and learning methods

Teaching and learning methods: This module combines lectures, tutorials and software practicals to build core electromechanical theory and analytical skills, alongside laboratory workshops and a group case study for hands-on experience in measurement, instrumentation and MATLAB® based simulation. Independent study underpins these activities, reinforcing learning through problem sets, readings and discussion.

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

MO1 Conduct basic electromechanical engineering calculations.

MO2 Analyse the behaviour of common electrical components.

MO3 Explain the operation of common industrial instrumentation.

MO4 Describe systems management policies.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/833CABA7-1655-4C50-5F48-8BB6567AD357.html?lang=en-GB) via the following link <https://rl.talis.com/3/uwe/lists/833CABA7-1655-4C50-5F48-8BB6567AD357.html?lang=en-GB>

Part 4: Assessment

Assessment strategy: The assessment for this module is as follows:

Examination (90 minutes): This will assess the learners' ability to solve electromechanical problems involving fundamental principles of electrical and mechanical components.

Written Report: Learners are required to produce written report on the fundamental principles of electrical components, control instrumentation and systems, including a portfolio of practical experiments and simulation activities.

The resit assessment tasks for this module will be the same as the first sit.

Assessment tasks:

Written Assignment (First Sit)

Description: Written review (2500 words)

Weighting: 75 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4

Examination (First Sit)

Description: Multiple Choice Exam (90 Minutes)

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1

Written Assignment (Resit)

Description: Written review (2500 words)

Weighting: 75 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4

Examination (Resit)

Description: Multiple Choice Exam (90 Minutes)

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [UCS] BEng (Hons)
2025-26

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS}
[UCS] BEng (Hons) 2025-26

Electrical, Electronic and Control Engineering with Nuclear [UCS] BEng (Hons)
2026-27

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS}
[UCS] BEng (Hons) 2026-27

Electromechanical Engineering (Nuclear) [UCS] FdSc 2026-27

Electromechanical Engineering (Nuclear) {Apprenticeship-UCS} [UCS] FdSc 2026-
27

Mechanical Engineering with Nuclear [UCS] BEng (Hons) 2026-27

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [UCS] BEng (Hons)
2026-27

Electrical, Electronic and Control Engineering with Nuclear [UCS] BEng (Hons)
2026-27

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS}
[UCS] BEng (Hons) 2026-27

Electromechanical Engineering (Nuclear) [UCS] FdSc 2026-27

Electromechanical Engineering (Nuclear) {Apprenticeship-UCS} [UCS] FdSc 2026-27

Mechanical Engineering with Nuclear [UCS] BEng (Hons) 2026-27

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [UCS] BEng (Hons) 2026-27