Module Specification

Electromechanical Systems Analysis

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Contents

Part 1: Information

Module title: Electromechanical Systems Analysis

Module code: UFMFWP-30-2

Level: Level 5

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

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: Learners will develop the theoretical understanding of electromechanical systems and how to use such systems for analysing and testing applications in the nuclear industry.

Outline syllabus: The topics covered in this unit are:

Electronic Systems Analysis:
Nuclear Detection Electronics Systems.
Classification.
Microprocessing.
Control System Response.

Mechanical System Analysis:
Simple System Vibration.
Vibration Transmission.
Continuous System Vibration.

Non-Destructive Evaluation:
Visual.
Electrical.
Sonic.
Other NDE Techniques.
Condition Monitoring.

In this module the following mathematical topics will be introduced and developed:
Laplace Transforms.
Systems of Linear Differential Equations.
Z transforms.

Part 3: Teaching and learning methods

Teaching and learning methods: The Electromechanical Systems and Design module introduces principles of electronic systems, vibration analysis and non-destructive evaluation methods in the nuclear industry. Learners will gain a through theoretical and practical basis to analyse electromechanical systems.

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

MO1 Conduct electromechanical systems analysis calculations

MO2 Analyse electronic processing systems for nuclear detection applications

MO3 Analyse mechanical vibration systems for equipment protection purposes

MO4 Evaluate electromechanical systems using non-destructive techniques

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

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/index.html

Part 4: Assessment

Assessment strategy: Assessment comprises of:

Multiple Choice Exam – 2 hours – This exam will assess the learners' understanding of advanced concepts of Electromechanical Systems analysis. It will also assess the learners' mathematical analysis skills of electromechanical systems calculations.

Student Led Presentation and Poster – The presentation will assess the learners' ability to evaluate non-destructive evaluation techniques. Learners will analyse electronic processing systems and mechanical vibration systems and represent their findings as a poster.

Resit:
Resit assessment will be the same as the first sit.

Assessment tasks:

Examination (First Sit)
Description: Multiple choice exam (2 hours)
Weighting: 25 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1

Poster (First Sit)
Description: Poster presentation
Weighting: 45 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3

Presentation (First Sit)
Description: Individual presentation to a group
Weighting: 30 %
Final assessment: No
Group work: No
Learning outcomes tested: MO4

Examination (Resit)
Description: Multiple choice exam (2 hours)
Weighting: 25 %
Final assessment: Yes
Group work: No
Learning outcomes tested:

Poster (Resit)
Description: Poster presentation
Weighting: 45 %
Final assessment: No

Group work: No
Learning outcomes tested:

Presentation (Resit)
Description: Recording of individual presentation
Weighting: 30 %
Final assessment: No
Group work: No
Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [UCS] BEng (Hons) 2022-23

Electromechanical Engineering (Nuclear) [UCS] FdSc 2022-23

Mechanical Engineering with Nuclear [UCS] BEng (Hons) 2022-23

Electromechanical Engineering (Nuclear) {Apprenticeship-UCS} [UCS] FdSc 2022-23

Electrical, Electronic and Control Engineering with Nuclear [UCS] BEng (Hons) 2022-23

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS} [UCS] BEng (Hons) 2022-23

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][5yrs] BEng (Hons) 2021-22

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][5yrs] BEng (Hons) 2021-22