Programme Specification

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

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Electro-mechanical Engineering (Nuclear) {Apprenticeship-UCW}{Top-Up}[Frenchay]

Highest award: BEng (Hons) Electro-Mechanical Engineering

Awarding institution: UWE Bristol

Affiliated institutions: University Centre Weston

Teaching institutions: UWE Bristol

Study abroad: No

Year abroad: No

Sandwich year: No

Credit recognition: No

Department responsible for the programme: FET Dept of Engineering Design & Mathematics, Faculty of Environment & Technology

Contributing departments: Not applicable

Professional, statutory or regulatory bodies: Not applicable

Apprenticeship: ST0289

Mode of delivery: Full-time

Entry requirements: N/A

For implementation from: 01 September 2023

Programme code: H36D00

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: The curriculum is delivered as a level 6 top-up programme for degree apprenticeship students requiring an engineering education closely aligned to engineering practice with specific relevance to the nuclear sector. Students entering the programme will have successfully completed FdSc Mechatronics which guarantees accredited learning can be awarded to level 4 and level 5 modules. Technical knowledge, engineering practice, business awareness and sustainability are integrated through projects and revisited to produce confident graduates able to apply their skills to novel situations and create engineering solutions that benefit society. Specialist nuclear knowledge is provided at level 6. The inclusion of a 40 credit level 6 project is a requirement of the Nuclear Scientist/Engineer integrated degree apprenticeship standard and forms part of the end point assessment.

Professional development is placed at the heart of the curriculum. From day one, students are taken on a journey from student engineer to graduate engineer, preparing them for life as an engineering professional. Students will identify, develop and demonstrate competencies expected of a professional engineer in the workplace. Projects and activities, embedded throughout the curriculum, are designed to develop the engineering habits of mind such as: Problem-finding, Problem-solving, Visualising, Systems Thinking, Improving, and Adapting. Foundation principles of engineering science, skills and practice are integrated throughout all years of study.

The programme is designed to provide the balance of theoretical and practical understanding needed to meet the demands of the electronic engineering industry for engineering practitioners, and in particular to meet the requirements for professional accreditation in partial fulfilment of CEng. Furthermore, it caters for students with both industrial and/or academic backgrounds, to develop problem solving skills and be able to demonstrate leadership in a number of engineering settings.

The Electro-Mechanical Engineering programme produces graduates with a wide range of expertise relevant to industry. Electro-Mechanical engineers are employed

throughout the engineering sector in the creation, maintenance and improvement of engineering operations. Consequently, engineering graduates need to be able to integrate engineering knowledge skills from across engineering and be able to be an effective member of a multidisciplinary team. The programme covers a broad range of disciplines such as control, Integrated Electro-mechanical systems and project management, as well as a deeper interdisciplinary level of learning such as advanced technologies and in manufacturing and energy. In addition to this, the programme includes specialised focus on Nuclear, which is demonstrated through the Nuclear Knowledge and final Nuclear Apprentice Project Modules.

The ability to work in multidisciplinary teams on projects that require a broader view of the role of engineering in industry and society is developed through the core programme using project weeks to bring students together in problem finding and solution spaces where students are able to interact with each other, academics and external practitioners.

The integration of knowledge, skills and practice allows the tackling of real engineering challenges and encourage students to engage with the wider role that mechanical engineers and specifically engineering habits of mind can play in tackling global challenges. This is an accessible and modern engineering curriculum designed to attract students from diverse backgrounds able to see the future role of engineering in industry and society and is designed to meet the demands of employers and degree apprentices.

Educational Aims: As a result of successful completion of this programme, a student will:

be able to work as a graduate electro-mechanical engineer across the engineering sector able to work as an effective member of a multidisciplinary team;

have acquired the knowledge and understanding of scientific principles and methods necessary to underpin an education in engineering with specific relevance to the nuclear sector;

have demonstrated an ability to integrate their knowledge and understanding of core subject material in order to solve a substantial range of engineering problems, including ones of a complex nature either individually or as part of a team;

have developed and demonstrated understanding of the competencies and social responsibilities required by a professional engineer in the workplace and society. Activities to scaffold this development are embedded throughout the core curriculum to develop the engineering habits of mind. As a consequence, students will be able to critically appraise the value and effectiveness of future engineering innovations in the field in terms of business improvement and environmental sustainability;

have the requisite academic knowledge, skills and preparation for progression to study for higher degrees in appropriate engineering disciplines.

Programme Learning Outcomes:
On successful completion of this programme graduates will achieve the following learning outcomes.

Programme Learning Outcomes

PO1. Research, apply and analyse concepts to solve engineering problems involving design, operations and manufacture that arise across engineering applications including new and emerging technologies.

PO2. Use systems incorporating digital hardware, software, communication, processing algorithms, interfacing circuits and parameter sensing and actuating devices to solve engineering problems.

PO3. Model Electro-mechanical engineering systems and be able to specify and assess technical designs.

PO4. Understand the financial, environmental and marketing implications of design proposals.

PO5. Use a systems approach to establish rigorous solutions that are fit for purpose and consider all aspects of a problem for the nuclear sector including production, operation, maintenance, sustainability and disposal.

PO6. Communicate and operate effectively, professionally and ethically either as individuals or as members of a team.

PO7. Pursue independent study, research and investigations to undertake enquiry into novel and unfamiliar concepts and implement change in an engineering environment.

PO8. Apply problem solving techniques and make considered judgements and decisions on complex engineering issues in which not all facts and consequences are accurately known.

Part B: Programme Structure

Year 1

The student must take 80 credits from the modules in Year 1.

Year 1 Compulsory Modules

The student must take 80 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFYS-15-3	Advanced Manufacturing Technology 2023-24	15
UFMFYJ-15-3	Control Engineering 2023-24	15
UFMFD7-15-3	Energy Technologies 2023-24	15
UFMFSL-15-3	Integrated Electro-Mechanical Systems 2023-24	15
UFMFYL-20-3	Nuclear Knowledge 2023-24	20

Year 2

The student must take 40 credits from the modules in Year 2.

Year 2 Compulsory Modules

The student must take 40 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFXL-40-3	Nuclear Apprenticeship Project 2024-25	40

Part C: Higher Education Achievement Record (HEAR) Synopsis

Graduates of this programme will be equipped with a broad understanding of electro-mechanical analysis and design, combined with knowledge of engineering practice, information technology and project management.

The programme produces graduates with a broad-based ‘systems’ approach to engineering problem solving. Graduates from this programme will be equipped to work in multi-disciplinary teams, able to critically appraise existing ideas and practice and produce creative solutions to engineering problems related to the nuclear engineering sector.

Part D: External Reference Points and Benchmarks

Description of how the following reference points and benchmarks have been used in the design of the programme:

QAA UK Quality Code for HE (October 2019)

Framework for higher education qualifications (FHEQ)

Subject benchmark statement for Higher Education qualifications in engineering (October 2019)

Strategy 2030

University policies

Staff research projects

IET requirements: AHEP3

Industrial Advisory Board

Level 6 Degree Apprenticeship Standard: Nuclear Scientist/Engineer

Part E: Regulations