Programme Specification

Electronic Engineering {Apprenticeship-UCW} {Top-Up} [Sep][FT][Frenchay][2yrs]

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Electronic Engineering {Apprenticeship-UCW} {Top-Up} [Sep][FT][Frenchay][2yrs]

Highest award: BEng (Hons) Electronic Engineering

Interim award: BEng Electronic Engineering

Awarding institution: UWE Bristol

Affiliated institutions: Not applicable

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: ST0025

Mode of delivery: Full-time

Entry requirements: For the current entry requirements see the UWE public website

For implementation from: 01 September 2018

Programme code: H60D43-SEP-FT-FR-H601

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: 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.

To produce graduates with a broad understanding of the discipline in conjunction with a detailed understanding of their chosen specialism of electronic engineering.

Educational Aims: The Electronic Engineering programme produces graduates with a wide range of expertise relevant to the electronics industry. The programme covers a broad range of disciplines such as digital and analogue circuit design, power electronics, control, signal processing and project management. A number of developments have occurred in electronic engineering in recent times, although signals are analogue in nature, many electrical or electronic designs involve conversion to digital format as soon a possible and processing by microprocessor or digital integrated circuit. In recognition of this, this programme allows students to develop expertise particularly in system design, microprocessor hardware/software design and simulation and modeling techniques.

The programme has been designed to cater 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 specific aims are that the graduate shall:

Gain a sound knowledge and understanding of the fundamental principles governing the behaviour of electronic and digital systems and of the related mathematics;

Be capable of analysis of the behaviour of complex electronic, digital electronic or

electrical systems ;

Demonstrate a capacity for innovative and creative design and be able to draw on knowledge of fundamental principles and proven systems to further develop existing systems and to generate new systems which meet required specifications;

Have a broad knowledge and understanding of engineering theory, practices and applications and be able to use advanced techniques of analysis, synthesis and simulation, and implementation in the field of electronic engineering or electrical engineering;

Have developed the ability, interest and motivation to conduct independent study and keep abreast of future changes in technology and engineering practices;

Be able to work in a largely unsupervised way to undertaken an individual research project and present the findings in a professional manner;

Be able to communicate clearly, concisely and persuasively with individuals and groups, using a professional standard of English, both orally and in writing.

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

Knowledge and Understanding

A1. Scientific principles and methodology necessary to underpin electronic and systems engineering, to enable appreciation of its scientific and engineering context in support of understanding of future developments and technologies

A2. Mathematical principles necessary to underpin electrical and electronic engineering and mathematical methods, tools and notations used in the analysis and solution of electrical and electronic engineering problems, number systems and their applications

A3. The range of applicability of abstract models of electronic components and their fundamental limitations in linear and non-linear circuit applications

A4. Electronic components, digital circuits and logic families and an ability to characterise them; ability to use combinatorial and sequential logic circuits; basic computer structure (microcomputer and DSP) their use in real- time applications. Ability to use HDL systems and techniques

A5. System-on chip design methodologies and their application to the top-down design of electronic systems

A6. The commercial, ethical, economic and legal context of engineering processes, including sustainable development, risk management, health and safety and environmental legislation

Intellectual Skills

B1. Demonstrate an understanding of the need for a high level of professional and ethical conduct in engineering

B2. The ability to investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues

B3. Critically review available literature relevant to the subject discipline

B4. Demonstrate independent thinking in the design and development of solutions to real-world problems

B5. The ability to select and apply appropriate computer-based methods for modelling and analysing problems in the fields relating to the design, manufacture and control of electrical and electronic components and systems

B6. The ability to understand issues relating to the marketing of products and the management processes associated with their design and manufacture

Subject/Professional Practice Skills

C1. Select and apply appropriate quantitative methods and computer software tools for the evaluation, analysis and solution of electronic and systems engineering problems and situations.

C2. Apply experimental methods in the laboratory relating to engineering design, manufacture and test

C3. Use relevant design, test and measurement equipment

C4. Execute and manage multi-disciplinary projects

C5. Undertake practical testing of design ideas through laboratory work or simulation with technical analysis and critical evaluation of results

C6. Apply engineering techniques taking account of environmental, industrial and commercial constraints

Transferable Skills and other attributes

D1. To communicate using professional standards of English, both orally and in writing, including, for instance, the results of technical investigations, to peers and/or to "problem owners"

D2. To manage his or her own time; to meet deadlines

D3. To work with others, being aware of the benefits and problems which teamwork can bring, having gained insights into the problems of team-based systems development

D4. To use software in the context of problem- solving investigations, and to interpret findings

D5. To express problems in appropriate notations

D6. To gain experience of, and to develop skills in, learning independently of structured class work, including the use of on-line facilities to further self-study

D7. To read and to use literature sources appropriate to the discipline to support learning activities

Part B: Programme Structure

Year 1
This programme is typically taught across both University Centre Weston and UWE Bristol.

Year 1 Compulsory Modules
The student must take 45 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFE7-15-3	Analogue Electronic Design 2018-19	15
UFMFW7-15-3	Control Systems Design 2018-19	15

UFMFDE-15-3	Power Electronics 2018-19	15

Year 1 Optional Modules
The student must take 15 credits from the modules in Optional Modules.

Module Code	Module Title	Credit
UFMFS7-15-3	Communications 2018-19	15
UFMFD7-15-3	Energy Technologies 2018-19	15

Year 2
The student must take 60 credits from the modules in Year 2.

Year 2 Compulsory Modules
The student must take 45 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFV8-15-3	Group Design and Integration Project 2019-20	15
UFMFX8-30-3	Individual Project BEng 2019-20	30

Year 2 Optional Modules
The student must take 15 credits from the modules in Optional Modules.

Module Code	Module Title	Credit
UFMFM7-15-3	Business Environment 2019-20	15
UFMFCL-15-3	Engineering and Society 2019-20	15
UFMF89-15-3	Industrial Placement 2019-20	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

Designed in conjunction with key national and multi-national employers, the Electronic Engineering programme provides graduates with the mix of skills and capabilities required by UK business for the specification, design and delivery of

electronic and embedded systems and solutions, including safety critical systems, as required by the aerospace, transport, medical, military and other industries. Delivered in a way that develops technically competent individuals who think and communicate effectively and who can conduct inquiry, solve problems, undertake critical analysis and deliver effective electronic and embedded software systems solutions in a constantly changing business context. It provides a solid foundation for lifelong learning, emphasising the development of knowledge, skills and professional values essential to the practice of systems development.

Part D: External Reference Points and Benchmarks

QAA subject benchmark statements:

All modules in the programme have been written to conform to the learning outcomes required by the Engineering Council UK. This is mandatory for accredited engineering programmes. The specific outcomes are derived from the requirements for electronic and digital engineering described in the The IET Handbook of Learning Outcomes for BEng and MEng programmes.

The modules have been designed to ensure adequate and appropriate coverage of these outcomes across the levels of study.

SEEC level descriptors have informed the design of the assessment of the learning outcomes.

University strategies and policies:

This programme is a refreshed and updated version of a programme that has run for many years. It has a long tradition of accepting students from diverse backgrounds and a wide range of entry qualifications. It accommodates student entry on a part-time basis at several points within the programme as well as having a tradition of direct entry to Year 2 for full-time overseas students. Modules within the programme are also delivered within partner institutions regionally and globally. Foundation degrees and higher apprenticeship schemes have been developed in conjunction with academic and industrial partners as feeders into this programme.

The new curriculum has been designed to take the best practice from the previous structure along with the introduction of online and electronic assessment. This, when combined with the new laboratories, will provide an enhanced student experience.

Staff research projects:

Research and industrial collaborations are key to several modules including UFMFHA-15-2, UFMFKA30-2, UFMFE7-15-3, and UFMFX8-30-3. There are strong links between the programme and the Institute for Bio-Sensing Technologies, the Bristol Robotics Lab, the Machine Vision group and knowledge exchange programmes. These collaborations help inform the M Level modules and project work at Levels 2, 3 and M.

Employer interaction and feedback:

The Department of Engineering Design and Mathematics works with a number of industrial partners through two consortia and a newly formed industrial liaison panel. Feedback from employers during visits to placement students has also has also helped inform this revised programme. The programme provides part-time options which ensure an ongoing interaction with regional employers.

Part E: Regulations

Approved variant to University Academic Regulations and Procedures.

The Institution for Engineering and Technology accreditation requirements:

All level 2 and level 3 credits are considered when calculating the Degree classification.

The degree classification for the 360 credit honours degrees BEng (Hons) Electrical and Electronic Engineering, BEng (Hons) Electronic Engineering, BEng Robotics and BEng Electronics and Computer Engineering (or 480 credit honours degree with an integrated foundation year) is based upon all the marks achieved at level 3 and all

the marks achieved at level 2. Marks achieved for level 3 credits are weighted three times the value of the marks for the level 2 credits (Paper AB16/05/07).