Programme Specification

Electronics and Telecommunication Engineering {Foundation} [Feb][FT][GCET][4yrs]

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Electronics and Telecommunication Engineering {Foundation} [Feb][FT][GCET][4yrs]

Highest award: BEng (Hons) Electronics and Telecommunication Engineering

Interim award: BEng Electronics and Telecommunication Engineering

Interim award: DipHE Electronics and Telecommunication Engineering

Interim award: CertHE Electronics and Telecommunication Engineering

Awarding institution: UWE Bristol

Affiliated institutions: Global College of Engineering and Technology (GCET)

Teaching institutions: Global College of Engineering and Technology (GCET)

Study abroad: No

Year abroad: No

Sandwich year: No

Credit recognition: No

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

Professional, statutory or regulatory bodies: Not applicable

Modes of delivery: Full-time

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

For implementation from: 01 February 2019

Programme code: H641-FEB-FT-GE-H641

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

The Electronics and Telecommunication 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 as 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, telecommunication engineering 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.

Features of the programme:

Educational Aims: gain a sound knowledge and understanding of the fundamental principles governing the behaviour of electronic, communication and digital systems and of the related mathematics;

be capable of analysis of the behaviour of complex electronic, communication and 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 undertake 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

Assessment strategy: The programme learning outcomes are achieved by using a range of assessment techniques across the modules at different levels. The programme requires the application of fundamental concepts and theory, often expressed in mathematical language to practical engineering situations. The assessment strategy reflects this requirement with coursework assignments used to allow students to develop understanding of concepts and explore their understanding through task according to level, practical examinations that ensure that these concepts can be applied with an appropriate level of reflection and traditional examinations where theory and application can be combined under controlled conditions. Group work activities and projects are used to develop a wider range of skills such as team work, project work and research methodology. Students are encouraged to communicate concepts and findings through reports and

presentations.

The mixture of examination/practical/coursework tasks reflects the broad and specific aims/objectives of the programme to introduce key concepts and domain knowledge and to develop skills in the selection and application of relevant tools and methods.

Student support: Academic Support
Academic advice and support is the responsibility of those delivering the individual modules. Academic staff is expected to be available outside normal timetabled hours, either by appointment or during published "surgery" hours, in order to offer advice and guidance on matters relating to the material being taught and on its assessment. Students also have a personal academic tutor

Developing graduate skills
All GCET students have free access to the training courses offered by GCET Training Centre on soft and graduate skills.

In year-1 students have group meetings with their Academic personal tutor to introduce reflection on graduate skills and career aspirations. Year 2 provides extensive opportunities toward career planning, including sessions from College careers and from industrial recruitment personnel toward application and CV writing, and good interview techniques. In Year 3 students engage with developing their graduate skills through project work and their project supervisor.

GCET Students' Services runs many seminars on employability and invites key professionals from industry to give talks.

Mathematics Support

Additional support in mathematics outside of timetabled classes is available throughout the academic year via

PAL sessions,

Drop-in mathematics at the Math Support Centre which also includes Mathematics Resource (.taken-away leaflets, text books, module handbooks and reference materials).

On-line support and electronic learning resources such as that Maths 1st Aid Kit leaflets, HELM booklets and http://www.mathcentre.ac.uk/ (iv) Mathematical software such Matlab.

Technology Enhanced Learning
All modules on the programme are available via the College's Virtual Learning Environment.

Computer based e-assessment is implemented in a number of modules, so that students can take regular short tests with automated computer generated feedback.

Recordings of some lectures (audio and/or video) are made available after classes via the College's Virtual Learning Environment.

Pastoral Care

The College offers pastoral care through two routes:

Personal Academic Tutors: All level 0 students are assigned a Personal Academic Tutor, who is an academic member of staff in their department. Students meet individually with their tutor at least twice a year and also participate in group sessions with the Personal Academic Tutor's tutor group (max size 15) during years 1, 2 and 3. In year 4 project supervisors take on the role of Personal Academic Tutor.

Student Advisers, a team of administrative staff who provide comprehensive, full-time student support service on a drop-in basis or by appointment. Advisers are trained to provide advice on matters commonly of concern, including regulatory and other matters; the Adviser will, when necessary, advise the student to seek advice

from other professional services including the College's Students Services or from members of academic staff.

Facilities to Support Learning

Within the College student learning will be supported in the following distinctive ways :

Through provision of Open Access and other available computer laboratories that provide access to a range of relevant computer based applications.

Technical support staff is available in laboratory sessions and during project work.

Laboratory facilities to support the technological modules. These include the Electronics Laboratory with facilities for investigation of electrical and electronic principles and circuit design, build and test, the Control and Telecommunications Laboratory with facilities for control system analysis and design, the Microprocessors and Digital Systems laboratory.

A Project Rooms which provide students with individual and group work spaces and the facilities.

College-wide services include a Virtual Learning Environment, library, English support Centre and Learning Centre.

Computing Facilities

The College offers a wide range of computing facilities running Windows operating system. In addition, the College runs two specialised labs which offer a variety of specialist engineering software In addition there is an Open Access lab, not used for teaching so giving access to machines at all times.

Support for the computing system is provided with extensive information on the web, ranging from which lab has free machines (on a real time basis), where to find

specific software packages and how to use the printing system, to problem solving and FAQs. A support desk provides first line support to users during normal office hours.

Part B: Programme Structure

Year 1

The student must take 120 credits from the modules in Year 1.

Year 1 Compulsory Modules

The student must take 120 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFEG-30-0	Engineering Experimentation 2019-20	30
UFMFBG-30-0	Foundation Mathematics: Algebra and Calculus 2019-20	30
UFCFGK-30-0	Professional and Academic Skills 2019-20	30
UFCEXX-30-0	Program Design and Implementation 2019-20	30

Year 2

The student must take 120 credits from the modules in Year 2.

Year 2 Compulsory Modules

The student must take 120 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFN7-15-1	C Programming 2020-21	15
UFMFF8-30-1	Digital Principles 2020-21	30
UFMFP8-15-1	Electrical and Electronic Principles A 2020-21	15

UFMFVA-15-1	Electrical and Electronic Principles B 2020-21	15
UFMFJ9-30-1	Engineering Mathematics 2020-21	30
UFMFCA-15-1	Practical Electronics 2020-21	15

Year 3
The student must take 120 credits from the modules in Year 3.

Year 3 Compulsory Modules
The student must take 90 credits from the modules in Compulsory modules.

Module Code	Module Title	Credit
UFMFV7-15-2	Control 2021-22	15
UFMFL9-15-2	Mathematics for Signals and Control 2021-22	15
UFMFKA-30-2	Microcontrollers Applications Group Lab 2021-22	30
UFMFHA-15-2	Project Management 2021-22	15
UFMFMA-15-2	Signal Processing and Circuits 2021-22	15

Year 3 Optional Modules
The student must take 30 credits from the modules in Optional Modules.

Module Code	Module Title	Credit
UFMFR7-15-2	Communications, Signals and Filters 2021-22	15
UFMFE8-30-2	Digital Design 2021-22	30
UFMFJ8-15-2	Drives and Motion 2021-22	15
UFMFQ8-30-2	Electrical Technology 2021-22	30
UFMFRJ-15-2	Power Systems Fundamentals 2021-22	15

Year 4
The student must take 120 credits from the modules in Year 4.

Year 4 Compulsory Modules
The student must take 105 credits from the modules in Compulsory Modules.

Module Code	Module Title	Credit
UFMFS7-15-3	Communications 2022-23	15
UFCF95-15-3	Entrepreneurial Skills 2022-23	15
UFMFXD-30-3	Individual Project BEng 2022-23	30
UFMFKN-15-3	Mobile and Wireless Communication 2022-23	15
UFMFJN-15-3	Radio Frequency and Microwaves Circuit Design 2022-23	15
UFMFLN-15-3	Satellite Communications 2022-23	15

Year 4 Optional Modules
The student must take a minimum of 15 credits from the modules in Optional Modules.

Module Code	Module Title	Credit
UFMFW7-15-3	Control Systems Design 2022-23	15
UFMFH8-15-3	Digital Signal Processing 2022-23	15
UFMFD7-15-3	Energy Technologies 2022-23	15
UFMFV8-15-3	Group Design and Integration Project 2022-23	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

Designed in conjunction with key national and multi-national employers, this programme provides graduates with the mix of skills and capabilities required by

Omani industry for the specification, design and delivery of electronic and communication systems and solutions, including control systems, as required by the manufacturing industries, transport, heavy electrical machines, plants, 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, control and communication systems solutions in a constantly changing Omani 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

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

QAA UK Quality Code for HE
National qualification framework
Subject benchmark statements 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.

College strategies and policies:

This programme addresses the College strategies through the following:

To produce “Able and Ready to Work Graduates”
To develop Distinctive Curriculum.
To establish assessment and feedback processes that enhance and deepen learning.
To promote research-informed education and evidence-based practice that supports an increasingly diverse student body.
To sustain and extend approaches to learning that further enhance the employability of GECT graduates and the career destinations they are able to reach.
To use technology and the campus environment to further enhance the student learning experience and teaching effectiveness within the context of a larger and more diverse student population

Staff research projects:

Research and industrial collaborations are key to several modules including UFMFHA-15-2, UFMFKA-30-2, UFMFE7-15-3, and UFMFX8-30-3.

Employer interaction and feedback:

The College works with a number of industrial partners through the Industrial Consultative Committee. Feedback from employers through their sponsored students also helped in the design of this programme. The programme provides part-time and flexible options which ensure an ongoing interaction with regional employers.

The methods that have been used to inform the development of this programme for delivery in Oman:

Consultation with the Ministry of Higher Education in the Sultanate of Oman.
Consultation with the Ministry of Manpower in the Sultanate of Oman and, in particular, the Engineering human resources needs.

Consultation with the University of Sultan Qaboos, the only public University in the Sultanate of Oman.
Consultation with the Directorate of Technical Vocation Education.
Feedback from students sponsored by different industries.
Consideration of the statistics from the National Center for Statistics and Information in the Sultanate of Oman.
Consideration of Oman's Ninth Five-Year Development Plan (2016-2020) where manufacturing has been identified as the top sector for development.

Part E: Regulations

Approved to University Regulations and Procedures.