STUDENT AND ACADEMIC SERVICES

PROGRAMME SPECIFICATION

Part 1: Basic Data		
Awarding Institution	UWE	
Teaching Institution	UWE	
Delivery Location	Frenchay Campus, Gloucestershire College SHAPE, Hong Kong	
Faculty responsible for programme	Environment and Technology	
Department responsible for programme	Engineering Design and Mathematics	
Modular Scheme Title	FET Modular Scheme	
Professional Statutory or Regulatory Body Links	Institution of Engineering and Technology	
Highest Award Title	BEng(Hons) Electronic & Computer Engineering	
Default Award Title		
Fall-back Award Title		
Interim Award Titles	Certificate of Higher Education Electronic & Computer Engineering Diploma of Higher Education Electronic & Computer Engineering BEng Electronic & Computer Engineering	
UWE Progression Route		
Mode(s) of Delivery	**FT/SW/PT**	
Codes	**UCAS: HM3L**	**JACS:**
	ISIS2:	**HESA:**
Relevant QAA Subject Benchmark Statements	Subject benchmark statements:Engineering, QAA (2015)	
CAP Approval Date	4 June 2015 v1.1, June 2016 v1.2	
Valid from	September 2015, September 2018 v2	
Valid until Date		
Version	2	

Part 2: Educational Aims of the Programme

- The programme is designed to provide a rich combination of sound engineering analysis, skill in designing computer engineering systems and creativity to meet the demands of the high tech electronic industry for engineering practitioners, and in particular to meet the requirements of advanced electronic engineering applications in the field of avionics, aerospace, automotive and embedded computer systems.
- To produce graduates with a broad understanding of scientific and engineering principles to be used in engineering discipline in conjunction with a detailed understanding of their chosen specialism in computer engineering.
- The programme produces graduates with expertise relevant to a wide range of industries including the electronics, aerospace, automobile, defence and oil and gas industries. The programme covers a broad range of disciplines such as digital and analogue circuit design, power electronics, control, signal processing, project management and embedded software. Many developments have occurred in these industries in recent times that involve complex low-level embedded computer systems.. In recognition of this, this programme allows students to develop expertise particularly in system design, microprocessor hardware/software design and simulation and modelling 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.
- To serve the local and regional needs of industry by providing opportunities to enhance the skills and educational base of the workforce through part-time delivery.

The educational aims of the programme outlined within this document are therefore to ensure that students:

- gain a sound knowledge and understanding of the fundamental principles governing the behaviour of electronic, digital and embedded systems and of the related mathematics;
- be capable of analysis of the behaviour of complex electronic, digital electronic or embedded 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 implementation in the field of electronic and computer 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 requirements for the purposes of the Higher Education Achievement Record (HEAR)

Designed in conjunction with key national and multi-national employers, the 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 3: Learning Outcomes of the Programme

The award route provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

Learning Outcomes:	UFM FJ9	UFM FCA	UFM FF8	UFC FF6	UFM FVA	UFM FHA	UFM FXE	UFC FCF	UFC FBF	UFM FL9	UFM FMA	UFM FE8	UFM FA7	UFM FV7	UFM FX8	UFM FV8	UFM F89	UFM FM7	UFM FS7	UFM FH8	UFM FW7	UFM FE7	UFM FDE	UFC FJ4	UFC FX4	UFC F6Y	UFM FMN	UFM FNN
A) Knowledge and understanding of:																												
1. 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.			X		X					X	X			X				X	X	X	X		X				X	X
2. 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.	X				X					X	X		X	X					X		X	X			X		X	X
3. 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.		X	X								X	X	X			X				X		X	X			X		
4. Program design and implementation concepts, methods, and notations,				X			X	X	X				X			X				X				X		X	X	X

Part 3: Learning Outcomes of the Programme

5.	the commercial, ethical, economic and legal context of engineering processes, including sustainable development, risk management, health and safety and environmental legislation.		X				X	X	X					X			X	X	X				X					X	X			
6.	Principles of operating systems, Real time systems, Distributing computing.							X	X	X								X								X	X	X				
(B)	**Intellectual Skills**																																
1.	Demonstrate an understanding of the need for a high level of professional and ethical conduct in engineering.				X		X									X	X	X	X									X	X	X		
2.	The ability to investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues.		X		X		X							X		X	X	X	X	X	X	X	X	X					X	X		
3.	Critically review available literature relevant to the subject discipline		X	X	X			X	X				X			X			X		X								X	X		
4.	Demonstrate the competencies involved in problem identification, analysis, design and development of a computer system, together with relevant and appropriate documentation.							X	X	X			X	X	X	X			X			X				X	X	X	X	X		
5.	Show an understanding of a range of problem solving and evaluation skills, together with an ability to marshal supporting evidence in favour of the chosen approach.		X	X	X	X		X	X			X	X			X	X					X				X	X		X	X		
6.	The ability to understand																																

Part 3: Learning Outcomes of the Programme

issues relating to the marketing of products and the management processes associated with their design and manufacture.						X							X				X					X			X	X		
(C) Subject/Professional/Practical Skills																												
1. Select and apply appropriate quantitative methods and computer software tools for the evaluation, analysis and solution of electronic and systems engineering problems and situations.	X				X					X	X	X		X	X	X			X	X				X		X	X	X
2. Apply experimental methods in the laboratory relating to engineering design, manufacture and test		X	X		X					X	X	X		X	X	X			X	X					X		X	X
3. Use relevant design, test and measurement equipment		X	X		X		X	X			X	X			X				X	X					X		X	X
4. Undertake practical testing of design ideas through laboratory work or simulation with technical analysis and critical evaluation of results.	X	X	X	X	X		X	X				X		X	X	X			X	X	X	X	X	X			X	X
5. Apply engineering techniques taking account of environmental, industrial and commercial constraints													X		X		X	X				X				X	X	X
(D) Transferable skills and other attributes																												
1. 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".		X	X	X			X	X			X		X	X	X	X	X	X		X			X	X		X	X	X

Part 3: Learning Outcomes of the Programme																																		
2. To manage his or her own time; to meet deadlines;	X	X	X	X	X		X	X	X	X	X	X		X	X		X	X	X	X	X	X	X				X	X					
3. 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.		X		X	X							X				X	X	X						X		X	X	X				
4. To use software in the context of problem-solving investigations, and to interpret findings	X		X	X	X		X		X		X	X		X	X				X			X					X	X				
5. To express problems in appropriate notations.	X		X		X		X	X	X	X	X	X		X	X				X	X	X	X	X				X					
6. 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.	X	X	X	X	X		X	X	X	X	X	X			X	X		X		X					X		X	X				
7. To read and to use literature sources appropriate to the discipline to support learning activities**.**	X	X	X	X	X		X	X	X	X	X	X			X	X		X	X	X	X	X	X				X	X				

Part 4: Student Learning and Student Support

Teaching and learning strategies to enable learning outcomes to be achieved and demonstrated

In addition to face-to-face contact time, a range of other learning activities will be embedded within the programme which, together with the contact time, will enable learning outcomes to be achieved and demonstrated. Engineering programmes are typically 18 hours contact per week in the first year reducing over succeeding years. This is due to the significant proportion of laboratory based study.

Induction is undertaken at UWE Frenchay and includes various laboratory exercises as well as the standard induction programme. Induction for part-time students and direct entrants to year 2 is tailored to their specific needs.

On the BEng (Hons) Electronic & Computer Engineering programme teaching is a mix of scheduled and independent. For the programme:

Scheduled learning includes lectures, tutorials, project supervision, demonstration, practical classes and workshops; external visits. Scheduled sessions may vary slightly depending on the module choices made.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc. These sessions constitute an average time per level as indicated in the table below.

Placement learning: There is an opportunity to undertake a year long industrial placement between years 2 and 3.

Gloucestershire College delivery:

Induction is undertaken at both Gloucestershire College and at UWE Frenchay as the students will be expected to use systems and resources at both sites. They are encouraged to see themselves as UWE students.

Description of any Distinctive Features

Academic Support
Academic advice and support is the responsibility of those delivering the individual modules.
Academic staff are 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.

Industrial Support
The Department has strong links with industrial partners through knowledge exchange, student placements and regular industrial liaison panel meetings. These links are used to inform the curriculum by identifying changing skill needs and gaps in provision. Employers also actively participate in aspects of course delivery.

The following is separated into sections applicable to the delivery site.

At UWE Frenchay:

Developing 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 placement and career planning, including sessions from university careers and placements team and from industrial recruitment personnel toward application and CV writing, and good interview techniques. In Year 3

Part 4: Student Learning and Student Support

students engage with developing their graduate skills through project work and their project supervisor.

PAL

The Peer Assisted Learning (PAL) scheme provides additional learning support for students by students. PAL leaders are recruited from the level 2, 3 and M cohorts each year and are trained in both facilitating learning and study skills. PAL leaders support taught modules by providing sessions in addition to lectures, labs and tutorials.

Mathematics and Programming Support

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

(i) PAL sessions,

(ii) Drop-in mathematics and programming helpdesks, "espressoMaths" and "espressoProgramming" which are open every week day during term in social learning spaces.

(iii) the Mathematics Resource Centre which is accessible by students using their swipe card and has take-away leaflets, text books, module handbooks and reference material

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

(v) Mathematical software such as Maple (which students may download for home use) and Matlab.

Technology Enhanced Learning

All modules on the programme are available via the university'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 university's Virtual Learning Environment.

Pastoral Care

The faculty offers pastoral care through two routes:

- Personal Academic Tutors: All level 1 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 and 2. In year 3 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 to from other professional services including the university's Centre for Student Affairs or from members of academic staff.

Facilities to Support Learning

Within the Faculty of Environment and Technology student learning will be supported in the following distinctive ways :

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

2. Through provision of the System Support Helpdesk that provides a range of support for learning to students including: support for a wide range of applications used by the students; help in the form of assistants who are trained to resolve many common student problems and help in the form of a large set of 'help-sheet documents', developed over a number of years, that cover a variety of common student requests for information.

Part 4: Student Learning and Student Support

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

4. Extensive laboratory facilities to support the technological modules. These include the Electronics Laboratory (2N40) with facilities for investigation of electrical and electronic principles and circuit design, build and test; the Control and Telecommunications Laboratory (1N65) with facilities for control system analysis and design; the Microprocessors and Digital Systems laboratory (2N24) as well as dedicated facilities for embedded systems development.

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

University-wide services include a Virtual Learning Environment (Blackboard), significant library facilities including dedicated services for international students, and a Global Student Support team.

Computing Facilities
In addition to the wide range of computing facilities offered by the University, the Faculty runs a specialised system with 13 laboratories running Windows and 4 with the Linux operating system. The facilities are available on a 24 hours basis during term time, with swipe card access during evenings, at night and at weekends. The labs offer a variety of specialist engineering software, much of which is available for students to download for their home machines. 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, staffed largely by placement students, provides first line support to users during normal office hours.

Industrial Support
The Department has strong employer links which are used to inform the curriculum by identifying changing skill needs and gaps in provision. Employers also actively participate in aspects of course delivery.

Within Gloucestershire College:

The college will deliver the first 2 years (240 credits) of the programme primarily in an accelerated part-time delivery over a period of three years to meet regional employer requirements. The final 120 credits will be studied at UWE Frenchay in part-time mode over two years.

1. Staff
Academic staff who teach on this programme are academically well qualified up to MSc level, have relevant extensive industrial experience and have extensive teaching experience. They are experienced in dealing with the needs of mature and part-time students.

2. Teaching Facilities
Students on this programme will benefit from excellent teaching facilities including well- equipped workshops and laboratories in the new Docklands campus, well equipped Electronics and Material Testing Labs and state-of-the-art classrooms with Interactive Whiteboards and Internet connections. The students also have full access to the engineering and library facilities at UWE.

3. Equipment
The educational experience of students on this programme will be enhanced by the use of equipment such as computer based test instrumentation, microprocessor and microcontroller development systems, miniaturised PLC electro mechanical rigs and specialist software, including electronic and mechanical Computer Aided Design.

4. Student Support
The College is committed to widening participation in learning, including enhancing progression into

Part 4: Student Learning and Student Support

HE provision. It has high quality learning support services which are used to address the barriers to learning faced by many learners in the area, including ESOL needs, child care barriers, physical disability barriers, financial and personal problems and cultural barriers. There are specific learner support arrangements for flexible learners in the workplace and extensive support mechanisms for managing mentoring programmes. 'Well organised additional learning support for students' was identified as a key strength in our last inspection report. All students receive tutorials for academic and pastoral support Additional support will be provided through.

- The Learning Gateway (i.e. a library)
- IT suites used for tutorial sessions
- A HE Student Support Pack
- A Work-Based Learning department to support work placements

5. Industrial Support

The College has strong employer links which are used to inform the curriculum by identifying changing skill needs and gaps in provision. Employers also actively participate in aspects of course delivery.

Students studying at GlosCol also have access to the all facilities and student support services at UWE.

Within SHAPE:

The School for Higher and Professional Education (SHAPE) is one of the member institutions of the VTC in Hong Kong. It operates top-up degree programmes through collaboration with overseas and local universities primarily to provide VTC's Higher Diploma graduates with an articulation pathway to degree level studies. SHAPE will deliver a top-up Electronic and Computer Engineering (ECE) degree.

1. Staff

SHAPE academic staff who teach on this programme are academically well qualified up to PhD level, with significant teaching and industrial experience. Some of them are also members of professional institutions like the Institution of Engineering and Technology (IET) and Hong Kong Institution of Engineers (HKIE). They are experienced in dealing with the needs of mature and part-time students.

2. Teaching Facilities

Students have access to various types of general and specialised learning facilities and support available at the offering site in IVE (Sha Tin). General teaching facilities include lecture theatres, classrooms, and computer laboratories. Supporting facilities include Learning Resources Centres and the Centre for Independent Language Learning. There are also well-equipped computer laboratories where students can access the Internet and various applications essential for their study and project work. IVE (Sha Tin) has also been equipped with up-to-date specialised facilities to support the operation of different modules. Some examples are the Internet Applications Laboratory, Mobile Technology Laboratory, the Electronic Engineering Laboratory and Communications Engineering Laboratory.

3. Equipment

The educational experience of students on this programme will be enhanced by the use of equipment such as computer based test instrumentation, microprocessor and microcontroller development systems, miniaturised PLC electro mechanical rigs and specialist software, including electronic and mechanical Computer Aided Design.

4. Student Support

SHAPE provides high quality learning support services to enable smooth transitions to Higher Education degrees. With a very diverse population of students, SHAPE provides specific learner support arrangements for flexible learners who are enrolled on both full-time and part-time programmes. Some of the facilities that SHAPE provides for student support are:

- Access to all computer and network services
- Learning Portal

Part 4: Student Learning and Student Support

- Centre for Independent Language learning
- Learning Resources Centre
- Sports facilities
- Counselling and graduate placement services
- Safe and Secure Campus with Insurance Coverage

5. Industrial Support

The close ties that VTC has with local industry in Hong Kong has helped to identify gaps in technology and engineering industry and thus help structure the top-up programme in ECE through new modules and changing skills requirements mainly in the context of Smart City that the Hong Kong government is putting a lot of emphasis on. Useful and up-to-date industry information is regularly provided by the engineering companies that participate in the Industry Based Student Project (IBSP) of the HD programmes, Engineering Discipline Advisory Board, the Biennial manpower survey from Electronics and Telecommunications Training Board (ECTB), etc.

Part 5: Assessment

A: Approved to University Regulations and Procedures

With the following variant:
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).

Assessment Strategy

Assessment strategy to enable the learning outcomes to be achieved and demonstrated:

A broad range of assessment strategies are used ensuring that both theoretical and practical aspects of the learning outcomes are assessed.

Testing of the knowledge base is through assessed coursework (individual and group), laboratory work, oral presentation, observed group meetings, through tasks undertaken under controlled conditions and through formal examinations.

Comprehension of and ability to apply intellectual skills are tested in all engineering modules, through coursework, lab and computer exercises and examinations.

Part 6: Programme Structure
This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **full-time or sandwich student**, including: level and credit requirements, interim award requirements, module diet, including compulsory and optional modules. The optional modules listed are the approved optional modules for the programme. The full range may not run every year. The definitive list will be made available on the UWE module choice system at the appropriate time of year.

<table>
<tr><td rowspan="7">ENTRY</td><td rowspan="6">Year 1</td><td>Compulsory Modules</td><td>Optional Modules</td><td>Interim Awards</td></tr>
<tr><td>UFMFCA-15-1
Practical Electronics</td><td rowspan="5">None</td><td rowspan="5">CertHE Electronic and Computer Engineering (120 credits, min 100 credits at level 1)</td></tr>
<tr><td>UFMFJ9-30-1
Engineering Mathematics</td></tr>
<tr><td>UFMFF8-30-1
Digital Principles</td></tr>
<tr><td>UFCFF6-30-1
Programming in C</td></tr>
<tr><td>UFMFVA-15-1
Electrical & Electronic Principles B</td></tr>
<tr><td rowspan="6">Year 2</td><td>Compulsory Modules</td><td>Optional Modules</td><td>Interim Awards</td></tr>
<tr><td>UFMFL9-15-2
Mathematics for Signals & Control</td><td rowspan="5">30 credits from:

UFMFXE-30-2
Embedded Systems Design

UFCFCF-15-2
Mobile & Embedded Devices

UFMFA7-15-2
Practical Electronic Design

15 Credits from:

UFCFBF-15-2
C++ Development

UFMFV7-15-2
Control</td><td rowspan="5">DipHE Electronic and Computer Engineering (240 credits with at least 100 at level 2 and a further 120 credits at level 1 or above)</td></tr>
<tr><td>UFMFE8-30-2
Digital Design</td></tr>
<tr><td>UFMFHA-15-2
Project Management</td></tr>
<tr><td>UFMFMA-15-2
Signal Processing & Circuits</td></tr>
<tr><td colspan="4">Year Out: Optional Placement Module Number: UFMF89-15-3</td></tr>
</table>

	Compulsory Modules	Optional Modules	Interim Awards
Year 3	UFMFX8-30-3 Individual Project	**15 Credits from** UFMF89-15-3 Industrial Placement (studied during placement year) UFMFM7-15-3 Business Environment	BEng Electronic and Computer Engineering (300 credits, min. 60 credits at Level 3 and a further 100 credits at Level 2 or above and 280 credits at Level 1 or above)
	UFMFV8-15-3 Group Design & Integration Project	**60 Credits from** UFMFS7-15-3 Communications UFMFW7-15-3 Control Systems Design UFMFH8-15-3 Digital Signal Processing UFMFE7-15-3 Analogue Electronics UFMFDE-15-3 Power Electronics UFCFJ4-15-3 Building & Porting Operating Systems UFCFX4-15-3 Designing & Developing Device Drivers UFCF6Y-30-3 Embedded Systems Development UFMFMN-30-3 Control and Automation UFMFNN-15-3 Internet of Things Engineering	BSc(Hons) Engineering (Default award 360 credits at appropriate levels where Individual Project UFMFX8-30-2 has not been passed at first attempt).

GRADUATION

Part 6: Programme Structure
This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **Gloucestershire College part-time student**, including: level and credit requirements, interim award requirements, module diet, including compulsory and optional modules. The optional modules listed are the approved optional modules for the programme. The full range may not run every year. The definitive list will be made available on the UWE module choice system at the appropriate time of year.

			Compulsory Modules	Optional Modules	Interim Awards
ENTRY	Year 1.1 at GlosCol	Level 1	UFMFF8-30-1 Digital Principles UFCFF6-30-1 Programming in C UFMFJ9-30-1 Engineering Mathematics	None	N/A
	Year 1.2 at GlosCol	Levels 1 & 2	UFMFVA-15-1 Electrical & Electronic Principles B UFMFCA-15-1 Practical Electronics UFMFXE-30-2 Embedded Systems Design UFCFBF-15-2 C++ Development	None	CertHE Electronic and Computer Engineering (120 credits, min. 100 credits at level 1 or above)
	Year 2.1 at Gloscol	Level 2	UFMFL9-15-2 Mathematics for Signals & Control UFMFSA-15-3 Systems Engineering (WBL) UFMFE8-30-2 Digital Design UFMFMA-15-2 Signal Processing & Circuits	None	DipHE Electronic and Computer Engineering (240 credits, min. 100 credits at level 2 and a further 120 credits at level 1 or above)

	Year 3.1 at UWE	Level 3	UFMFV8-15-3 Group Design & Integration Project	**45 Credits from** UFMFS7-15-3 Communications UFMFH8-15-3 Digital Signal Processing UFMFE7-15-3 Analogue Electronics UFMFDE-15-3 Power Electronics UFCFJ4-15-3 Building & Porting Operating Systems UFCFX4-15-3 Designing & Developing Device Drivers UFCF6Y-30-3 Embedded Systems Development UFMFMN-30-3 Control and Automation UFMFNN-15-3 Internet of Things Engineering	BEng Electronic and Computer Engineering (300 credits, min. 60 credits at Level 3 and a further 100 credits at Level 2 or above and 280 credits at Level 1 or above)
	Year 3.2 at UWE	Level 4	UFMFX8-30-3 Individual Project UFMFM7-15-3 Business Environment UFMFW7-15-3 Control Systems Design		

Part 6: Programme Structure
This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **Gloucestershire College part-time student**, including: level and credit requirements,

interim award requirements, module diet, including compulsory and optional modules. The optional modules listed are the approved optional modules for the programme. The full range may not run every year. The definitive list will be made available on the UWE module choice system at the appropriate time of year.

ENTRY	Year 1	Compulsory Modules	Optional Modules	Interim Awards
		UFMFF8-30-1 Digital Principles UFCFF6-30-1 Programming in C UFMFJ9-30-1 Engineering Mathematics	None	N/A
	Year 2	UFMFVA-15-1 Electrical & Electronic Principles B UFMFCA-15-1 Practical Electronics UFMFXE-30-2 Embedded Systems Design UFCFBF-15-2 C++ Development	None	CertHE Electronic and Computer Engineering (120 credits, min. 100 credits at level 1 or above)
	Year 3	Compulsory Modules	Optional Modules	Interim Awards
		UFMFL9-15-2 Mathematics for Signals & Control UFMFHA-15-2 Project Management UFMFE8-30-2 Digital Design UFMFMA-15-2 Signal Processing & Circuits	None	DipHE Electronic and Computer Engineering (240 credits, min. 100 credits at level 2 and a further 120 credits at level 1 or above)

GRADUATION

Part 6: Programme Structure
This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **full-time student at the School for Higher and Professional Education (SHAPE) in**

Hong Kong, including: level and credit requirements, interim award requirements, module diet, including compulsory and optional modules. The 120 credit programme at SHAPE is designed to enable entry to students who have successfully completed a qualification equivalent to studies at level 1 and level 2 (HKQF 3 and 4) of a UK undergraduate degree programme in an area of Electronics or Computer Engineering.

	Compulsory Modules	Optional Modules	Interim Awards
Year 3	UFMFV8-15-3 Group Design & Integration Project UFMFX8-30-3 Individual Project UFMFM7-15-3 Business Environment UFMFH8-15-3 Digital Signal Processing UFMFNN-15-3 Internet of Things Engineering	**30 Credits from** UFMFMN-30-3 Control and Automation UFCF6Y-30-3 Embedded Systems Development	

GRADUATION

Part 6: Programme Structure

This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **part-time student at SHAPE in Hong Kong**, including: level and credit requirements, interim award requirements, module diet, including compulsory and optional modules. The 120 credit programme at SHAPE is designed to enable entry to students who have successfully completed a qualification equivalent to studies at level 1 and level 2 (HKQF 3 and 4) of a UK undergraduate degree programme in an area of Electronics or Computer Engineering.

	Compulsory Modules	Optional Modules	Interim Awards
Year			

		UFMFV8-15-3 Group Design & Integration Project UFMFH8-15-3 Digital Signal Processing	**30 Credits from** UFMFMN-30-3 Control and Automation UFCF6Y-30-3 Embedded Systems Development	
	Year 3.2	UFMFX8-30-3 Individual Project UFMFM7-15-3 Business Environment UFMFNN-15-3 Internet of Things Engineering		

GRADUATION

Part 7: Entry Requirements

The University's Standard Entry Requirements apply with the following additions

- To include Mathematics at GCE A level
- Relevant BTEC National Diplomas to included Further Maths for Technicians.
- 14-19 Engineering Diploma provided that the Additional Specialist Learning module in Mathematics or an A level in Mathematics is taken alongside.
- Access to HE Diploma; achievement of level 3 credits in Maths (to match content of A level maths in Calculus and Pure Maths)
- Baccalaureate IB: to include HL Maths and Science

Tariff points as appropriate for the year of entry, which is currently 120 points.

Direct entry to level 3: in addition to the University's Standard Entry requirements, students should hold a qualification which can be recognised as equivalent to the learning outcomes of levels 1 and 2 of the UWE BEng (Hons) Electronic and Computer Engineering and which meets any pre-requisite requirements for entry directly into Level 3.

For students registering on the top-up BEng (Hons) Electronic and Computer Engineering (ECE) programme at SHAPE, the first 2 years (240 credits) of the ECE programme will be obtained from Higher Diploma (HD) programmes delivered at VTC. These programmes have been mapped by UWE to its own to level 1 and 2 learning outcomes to ensure that the learning experience at VTC is at an appropriate level and provides sufficient coverage of underpinning knowledge to adequately prepare the applicant for modules to be studied in the top-up programme. The mapped VTC HDs are:

- HD in Digital Electronics and Embedded System Design
- HD in Computer and Information Engineering
- HD in Internet and Multimedia Engineering
- HD in Computer Engineering
- HD in Electronic and Communications Engineering

In addition to the recognised VTC feeder HD programmes, applicants with non-feeder qualifications will be considered on a case by case basis by UWE. In such cases, applicants will be expected to

(1) Hold a relevant post-secondary qualification (such as a Higher Diploma or Associate Degree

Part 7: Entry Requirements

awarded by an educational institution in Hong Kong); and

(2) Meet the English language requirements:
   a. At least an overall IELTS score of 6.5 with 5.5 in each component;
   b. OR an overall IELTS score of 6.0 with 6.0 in each component;
   c. OR equivalent.

Applicants holding post-secondary qualifications taught and assessed in English will be considered to have met the English language requirements for entry to the top-up programme. VTC HD graduates are considered to have met the English language requirements of the top-up programme in Hong Kong.

Part 8: 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 and the QAA Engineering Benchmark 2015 provided the underlying framework with the specific learning outcomes and the module contents being defined bythe 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, digital and computer systems engineering described in the Engineering Councils documentation for the Accreditation of Higher Engineering Programmes (AHEP) and the IET guidance for specific engineering disciplines.

University strategies and policies

This programme is clearly designed to address skills shortages in the STEM related sectors. It provides a part-time route into HE for apprentices helping to address the aim of widening participation. It enhances collaborative opportunities with regional and multi-national employers. It is a partner programme to two established programmes with a 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 direct entry to year 2 for full-time overseas students from equivalent courses.

Modules within the programme are also delivered within partner institutions regionally and globally. It has been designed to closely match a key foundation degree thus facilitating entry into year 3. This was developed in conjunction with academic and industrial partners as feeders into this programme.
The curriculum has been designed to take the best practice from other programmes along with the introduction of online and electronic assessment.

Staff research projects

Research and industrial collaborations are key to several modules including UFMFHA-15-2, UFMFE7-15-3, UFMFX8-30-3. There are strong links between the programme and the Institute for Bio-Sensing Technologies, the Bristol Robotics Lab, the Centre for Machine Vision and knowledge transfer programmes.

Any relevant PSRB requirements:

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, digital and computer systems engineering as described in the Accreditation of Higher Education Programmes (AHEP) third edition and associated documentation and in the QAA Engineering Benchmark Statement 2015.

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

Part 8: Reference Points and Benchmarks

The programme was designed in conjunction with industrial partners (including GE Aviation (Bishops Cleeve), GE Oil & Gas (Nailsea) and others) to provide a study route for higher engineering apprentices in the aerospace and related industries. It has been developed via a number of stakeholder meetings held at GlosCol and at UWE Frenchay. This included current and past students on related programmes.

Regular liaison meetings will be held with the key stakeholders. This ensures that the programme meets the requirements of major employers regionally, nationally and globally in providing the blend of academic and vocational skills needed by modern engineers.

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