Glasgow Caledonian University

School of Engineering and Built Environment

BEng(Hons) in Computer and Electronic Systems Engineering (with Pathways)

Programme Specification Proforma (PSP)

November 2015

GLASGOW CALEDONIAN UNIVERSITY

Programme Specification Pro-forma (PSP)

---

1. GENERAL INFORMATION

1. Programme Title:		**BEng(Hons)/BEng** Computer and Electronic Systems Engineering
2. Final Award:		**BEng(Hons)** Computer and Electronic Systems Engineering (Digital Systems) [a] Computer and Electronic Systems Engineering (Communications Systems) [a] Computer and Electronic Systems Engineering (Robotics and Mechatronics) [a] [a] also (Sandwich)
3. Exit Awards:		CertHE & DipHE Electronic Technologies BEng (Unclassified) Computer and Electronic Systems Engineering BEng (Unclassified) Computer and Electronic Systems Engineering (Sandwich)
4. Awarding Body:		Glasgow Caledonian University
5. Approval Date:		May 2010
6. Faculty/School:		School of Engineering and Built Environment
7. Host Department:		Department of Computer, Communications and Interactive Systems (CCIS)
8. UCAS Code:		**IH16**
9. PSB Involvement:		The Institution of Engineering and Technology (IET)
10. Place of Delivery:		GCU
11. Subject Benchmark Statements:		EC^{UK} UK_SPEC
12. Dates of PS Preparation/Revision:		May 2013 **(See note on renaming in Section 2**) November 2015

2. EDUCATIONAL AIMS OF THE PROGRAMME

2.1 Programme Background and Philosophy

The BEng Computer and Electronic Systems Engineering (CESE) programme collects together into a single programme an existing set of programmes (originally validated in May 2010 within a suite called *Product Design Engineering for Electronic Technologies* (*PDEET*)). The Academic Policy Committee approved the name change and the move to a single BEng on 5 December 2012. Permission was also sought (and granted) from the IET accrediting body to allow the existing three-year accreditation of the PDEET suite (in partial fulfillment of the educational requirements for CEng registration) to be moved to the new programme title.

The **original** PDEET BEng programmes are:

BEng/BEng (Hons) Digital Systems Engineering
BEng/BEng (Hons) Network & Communications Engineering
BEng/BEng (Hons) Robotic & Mechatronic Systems Engineering
BEng/BEng (Hons) Instrumentation Systems Engineering

The specialisms within the original separate PDEET named degree programmes are reflected in the new programme as explicit *pathways* that appear on the students' degree transcripts:

BEng Computer and Electronic Systems Engineering (Digital Systems)
BEng Computer and Electronic Systems Engineering (Communications Systems)
BEng Computer and Electronic Systems Engineering (Robotics and Mechatronics)

Note that the *Instrumentation Systems Engineering* theme has been removed due to lack of student interest.

There is also in existence a (renamed) complementary programme: *BSc Computer and Electronic Systems Engineering.*

The aim of the BEng and BSc CESE programmes is to develop well rounded graduate engineering professionals with:

☐ Defining (technical) skills grounded in the design and development of electronic products and systems.

☐ Strong enabling (soft and business related) skills.

☐ A keen sense of personal, professional, social and environmental responsibility.

The BEng programme outcomes correspond with the engineer as *technical specialist* (supporting the need for technology "innovators") with technical expertise enhanced in selected niche areas. A BEng(Hons) exit award from an institution accredited by the IET (Institute of Engineering and Technology) provides partial fulfillment of the competence and commitment required for the registration of Chartered Engineers (CEng). There is an expectation students will exercise leadership, initiative, personal responsibility and decision making in complex and unpredictable situations.

The BSc(Hons) programme provides a broader curriculum which combines a subset of defining technical skills with expertise in selected other discipline areas. The BSc(Hons) programme outcomes correspond with the engineer as:

☐ *Integrator*, by combining selected core technical engineering skills with additional *software development* skills, since increasingly software is the "superglue" of 21st century electronic systems integration.

☐ *Change Agent*, by combining selected core technical engineering skills with additional *business, leadership and enterprise management* skills or additional

analytical skills (mathematical modelling and statistical analysis), thus supporting industry's need for innovation through effective exploitation of electronic technologies, an area where the UK excels.

The programme is designed to encourage student creative thinking, to develop design visualization skills, expand knowledge, confidence and professional values, so that students can move into a successful career in innovative product design where electronics is the key.

2.2   General Aims of the Programme

The programme aims to:

- provide a broad education by an integrated study of vocational and academic disciplines.

- provide students the benefits of a common first two years. A first year provides opportunities to explore pathways within the general theme of Computer and Electronic Systems Engineering as well as those that are core to their understanding of an engineering discipline.

- provide experience of, and the opportunity to transfer to a range of named pathways.

- create in the student an ability to think clearly, rationally, logically, and in a pragmatic manner and to be able to exercise responsibility.

- equip the student with a range of analytical methods for use in engineering applications and product design within the electronic engineering specialism.

- provide such principles and practice as will allow the student to acquire an understanding of engineering practices to cope adequately with current and emerging technologies within the electronic engineering specialism

- develop the students' ability to contribute to the specification, design, testing, commissioning, modification, manufacture, maintenance and de-commissioning of engineering systems, products and processes.

- develop fully the student's abilities in the use of computer technologies, computer aided engineering tools and relevant aspects of information technology.

- to extend, enhance and improve the judgement of the student in decision making by extension of analytical, creative and intellectual skills.

- equip the student with problem solving strategies to enable the application of knowledge in a flexible manner.

- provide significant exposure to team based projects and problem based learning, and opportunities to develop the students' interpersonal and key soft skills.

- make the student aware of the social impact of engineering including ethical and environmental consequences and considerations.

- integrate the expertise of staff gained from research, consultancy and scholarly activity into the programme delivery as appropriate.

- sustain existing, and seek further industrial partnerships that provide access to design-oriented case studies and projects, work experience and real world problems.

- emphasise market and business realities.

4. PROGRAMME STRUCTURES AND REQUIREMENTS, LEVELS, MODULES, CREDITS AND AWARDS

4.1 Full-Time and Sandwich Programme Curriculum

YEAR 1

Module Code	Module Title	Trimester	Credits
M1H620322	Principles of Programmable Systems	1	10 SHE1
M2H622026	Digital Electronics	1	10 SHE1
M2H622023	Analogue Electronics	1	10 SHE1
M1I323146	Fundamentals of Computing	1/2	20 SHE1
M1H321924	Mechanical Principles A	1	10 SHE1
M1H620653	Integrated Design Project 1	2	20 SHE1
M1G108778	Mathematics 1	2	20 SHE1
M1I322910	Web Platform Development 1	2	20 SHE1
Exit Award – Certificate of Higher Education (CertHE) in Electronic Technologies			**120**

YEAR 2

Module Code	Module Title	Trimester	Credits
M2H620492	Electrical Principles and Circuit Theory	1	20 SHE2
M2G620493	Software Development for Engineers	1	20 SHE2
M2G520040	Data Communications and Transmission Systems	1	20 SHE2
M2H620655	Integrated Design Project 2	2	20 SHE2
M2H620495	Digital and Programmable Systems 1	2	20 SHE2
	Specialist Option – Choose one from:		
M2H020497	Signals and Electronic Systems	2	20 SHE2
M2H620057	Control and Instrumentation Systems	2	20 SHE2
Exit Award – Diploma of Higher Education (DipHE) in Electronic Technologies			**240**

			Trimester	Credits
	YEAR 3:			
	Pathway – Digital Systems			
	Module Code	**Module Title**	**Trimester**	**Credits**
	M2G108818	Mathematics 2	1	20 SHE2
	M3H620581	Wireless Communication Principles	1	20 SHEH
	M3H620587	Signals and Electronic Systems Design	1	20 SHE3
	M3H623181	Integrated Design Project 3	2	20 SHE3
	M3N123160	Operations and Supply Chain Management	2	20 SHE3
	MHG520578	Digital and Programmable Systems 2	2	20 SHEH
	Pathway – Communications Systems			
	Module Code	**Module Title**	**Trimester**	**Credits**
	M2G108818	Mathematics 2	1	20 SHE2
	M3H620581	Wireless Communication Principles	1	20 SHEH
	M3H620587	Signals and Electronic Systems Design	1	20 SHE3
	M3H623181	Integrated Design Project 3	2	20 SHE3
	M3N123160	Operations and Supply Chain Management	2	20 SHE3
	MHG520578	Digital and Programmable Systems 2	2	20 SHEH
	Pathway – Robotics and Mechatronics			
	Module Code	**Module Title**	**Trimester**	**Credits**
	M2G108818	Mathematics 2	1	20 SHE2
	M3H620587	Signals and Electronic Systems Design	1	20 SHE3
	M3H606414	Control Engineering 3	1	20 SHE3
	M3H620657	Integrated Design Project 3	2	20 SHE3
	MHG520578	Digital and Programmable Systems 2	2	20 SHEH
	M2H721926	Engineering Design & Analysis 2	2	20 SHE2
	Exit Award – BEng (unclassified) Computer and Electronic Systems Engineering			**360**

	YEAR 4 Pathway – Digital Systems			
	Module Code	**Module Title**	**Trimester**	**Credits**
	MHH623549	Honours Project	1 & 2	40 SHEH
	MHH623541	Digital Signal Processing	1	20 SHEH
		Specialist Option 1	1	20 SHEH
	MHH620659	System Level Design	2	20 SHEH
		Specialist Option 2	2	20 SHEH
	Final Award – BEng(Hons) Computer and Electronic Systems Engineering (Digital Systems)			**480**
		Specialist Option 1:		
	MHH623542	Digital Design & Computer Architecture	1	20 SHEH
		Specialist Option 2 :		
	MHH623546	Intelligent Robotics & Mechatronics	2	20 SHEH

	YEAR 4 Pathway – Communications Systems			
	Module Code	**Module Title**	**Trimester**	**Credits**
	MHH623549	Honours Project	1 & 2	40 SHEH
	MHH623541	Digital Signal Processing	1	20 SHEH
		Specialist Option 1	1	20 SHEH
	MHH620659	System Level Design	2	20 SHEH
		Specialist Option 2	2	20 SHEH
	Final Award – BEng(Hons) Computer and Electronic Systems Engineering (Communications Systems)			**480**
		Specialist Option 1:		
	MHH623542	Digital Design & Computer Architecture	1	20 SHEH
		Specialist Option 2 – Choose one from:		
	MMH6xxxxx	Optical Communications & Photonics Networks	2	20 SHEH

	YEAR 4 Pathway – Robotics and Mechatronics			
	Module Code	**Module Title**	**Trimester**	**Credits**
	MHH623549	Honours Project	1 & 2	40 SHEH
		Specialist Option 1	1	20 SHEH
	MHH623541	Digital Signal Processing	1	20 SHEH
		Specialist Option 2	2	20 SHEH
	MHG520578	Digital and Programmable Systems 2	2	20 SHEH
		Specialist Option 1:		
	M3H120320	Engineering Design Analysis	1	20 SHEH
		Specialist Option 2:		
	MHH623546	Intelligent Robotics & Mechatronics	2	20 SHEH
	Final Award – BEng(Hons) Computer and Electronic Systems Engineering (Robotics and Mechatronics)			**485**

	Notes:
1.	*Level 2 to Level 3 Attainment Filter.* Students may progress to BEng Level 3 if they satisfy the Assessment Board that they have been awarded 240 credits and they have achieved an overall aggregate average mark of 50% for Level 2. Students who fail to achieve an overall aggregate average mark of 50% for Level 2 will be counselled and strongly recommended to pursue an alternate BSc(Hons) study pathway in a related field of study.
2.	*Student Exchange (Optional).* After successful completion of Level 3 Trimester 1 students maybe eligible to undertake an optional study exchange during Trimester 2 at an appropriate host Institution outwith the UK, provided the agreed programme of activity is equivalent to the curriculum and intended student experience normally undertaken in Level 3 Trimester 2. Successful completion of the study exchange is credit bearing to 60 credits.
3.	*Industrial Placement Year (Optional) Exit Award.* Students opting to undertake placement do so in the academic session after Level 3 studies. Assessment is via the additional 60 SCOTCAT level 3 credit module, M3H105245 Applied Computer Based Systems Engineering Practice. Successful completion of that module gives (Sandwich) in the final exit award obtained by the student.

8.   ASSESSMENT REGULATIONS

The standard Glasgow Caledonian University Assessment Regulations (See the appropriate entry in: http://www.gcu.ac.uk/student/regulations/) apply to this programme.