



School of Engineering and Built Environment

**BEng(Hons)/MEng in Electrical and Electronic Engineering (with  
Routes)**

**Programme Specification Proforma (PSP)**

**April 2016**

## Programme Specification Pro-forma (PSP)

### 1. GENERAL INFORMATION

- |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Programme Title:</b>                   | <p><b>BEng(Hons)/MEng</b><br/>         Electrical and Electronic Engineering<br/>         Electrical and Electronic Engineering<br/>         (Digital Systems)<sup>a</sup><br/>         Electrical and Electronic Engineering<br/>         (Telecommunications)<sup>a</sup><br/>         Electrical and Electronic Engineering<br/>         (Mechatronics)<sup>a</sup></p> <p><sup>a</sup> also (Sandwich)</p>                                                                                           |
| <b>2. Exit Awards:</b>                       | <p>CertHE &amp; DipHE Electronic Technologies<br/>         BEng (Unclassified) Electrical and Electronic Engineering<br/>         BEng (Unclassified) Electrical and Electronic Engineering<br/>         (Sandwich)<br/>         BEng (Hons) Electrical and Electronic Engineering<br/>         BEng (Hons) Electrical and Electronic Engineering<br/>         (Sandwich)<br/>         MEng Electrical and Electronic Engineering<br/>         MEng Electrical and Electronic Engineering (Sandwich)</p> |
| <b>3. Awarding Body:</b>                     | Glasgow Caledonian University                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>4. Approval Date:</b>                     | April 2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>5. Faculty/School:</b>                    | School of Engineering and Built Environment                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>6. Host Department:</b>                   | Engineering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>7. UCAS Code:</b>                         | <p><b>H610 (BEng)</b><br/> <b>H611 (MEng)</b><br/> <b>H632 (GCU Pathways)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>8. PSB Involvement:</b>                   | The Institution of Engineering and Technology (IET)                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>9. Place of Delivery:</b>                 | GCU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>10. Subject Benchmark Statements:</b>     | EC <sup>UK</sup> UK_SPEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>11. Dates of PS Preparation/Revision:</b> | April 2016 (See note on renaming in Section 2)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## 2. EDUCATIONAL AIMS OF THE PROGRAMME

### 2.1 Programme Background and Philosophy

The BEng/MEng Electrical and Electronic Engineering (EEE) 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 renamed programme to Computer and Electronic Systems Engineering as explicit *routes* 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)

There is also in existence a (renamed) complementary programme: *BSc Computer and Electronic Systems Engineering* which has been removed due to the development of the MEng provision.

The aim of the BEng and MEng EEE 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). The MEng exit award fully provides the educational requirements for CEng registration. There is an expectation that MEng students will be fully equipped to exercise leadership, initiative, personal responsibility and decision making in complex and unpredictable situations.

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 routes 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 routes.
- 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

<b>EEE BEng Level 1: All Routes</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
M1H323564	Mathematics 1A	A	10 SHE1
M1H321924	Mechanical Principles A	A	10 SHE1
M1H623526	Electrical Principles and Circuit Theory	A	20 SHE2
M1H106590	Engineering Applications	A/B	20 SHE1
M1H623547	Principles of Programmable Systems A	A	10 SHE1
M1H623617	Integrated Engineering Studies 1	B	20 SHE1
M1H323565	Mathematics 1B	B	10 SHE1
M1H121922	Engineering Materials	B	10 SHE1
M1H623548	Principles of Programmable Systems B	B	10 SHE1
<b>Exit Award – Certificate of Higher Education (CertHE) in Electronic Technologies</b>			<b>120</b>

<b>EEE BEng Level 2 Routes: 1.Digital Systems 2.Telecommunications 3. Mechatronics</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
M2H323566	Mathematics 2A	A	10 SHE2
M2G620493	Software Development for Engineers	A	20 SHE2
M2H623525	Analogue and Digital Electronics	A	20 SHE2
M2H623625	Integrated Engineering Studies 2	A	10 SHE2
M2H323567	Mathematics 2B	B	10 SHE2
M2H623552	Electrical Systems	B	10 SHE2
M2H623629	Digital and Programmable Systems 1	B	20 SHE2
M2H622325	Control and Instrumentation Systems	B	20 SHE2
M2H020497	Signals and Electronic Systems	B	20 SHE2
<b>Exit Award – Diploma of Higher Education (DipHE) in Electronic Technologies</b>			<b>240</b>

##### Full-time Delivery Structure for Year 2

<b>EEE BEng Level 3 Routes: 1.Digital Systems 2.Telecommunications</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
M3H623544	Digital and Programmable Systems 2	A	20 SHE3
M3H623517	Communications Engineering	A	20 SHE3
M3H620587	Signals and Electronic Systems Design	A	20 SHE3
M3H623554	Integrated Engineering Studies 3	B	20 SHE3
M3H723623	Engineering Operations and Management	B	20 SHE3
M3H623538	Modelling and Data Analysis	B	20 SHE3
M3H323616	European Exchange Placement (optional)	B	60 SHE3
<b>Exit Award – BEng (unclassified) Electrical and Electronic Engineering</b>			<b>360</b>

<b>EEE BEng Level 3 Route: Mechatronics</b>			
<b>Module No.</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credit</b>
MHH113285	Computer Aided Engineering	A	20 SHEH
M3H623544	Digital and Programmable Systems 2	A	20 SHE3
M3H606414	Control Engineering 3	A	20 SHE3
M3H623554	Integrated Engineering Studies 3	B	20 SHE3
M3H723623	Engineering Operations and Management	B	20 SHE3
M2H721926	Engineering Design and Analysis 2 or	B	20 SHE2
M2H020497	Signals and Electronic Systems	B	20 SHE2
<b>Exit Award – BEng (unclassified) Electrical and Electronic Engineering</b>			

<b>Optional year in industry</b>			
<b>EEE BEng Level 3+ Routes: 1.Digital Systems 2.Telecommunications 3. Mechatronics</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
M3H721925	Industrial Practise	A/B	60 SHE3
<b>Exit Award – BEng (unclassified) Electrical and Electronic Engineering</b>			<b>420</b>

<b>EEE BEng Level 4 Route: Digital Systems</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
MHH623549	Honours Project Engineering	A/B	40 SHEH
MHH623541	Digital Signal Processing	A	20 SHEH
MHH623542	Digital Design and Computer Architecture	A	20 SHEH
MHH620659	System Level Design	B	20 SHEH
MHH623546	Intelligent Robotics and Mechatronics	B	20 SHEH
<b>Exit Award – BEng (Hons) Electrical and Electronic Engineering</b>			<b>480</b>

<b>EEE BEng Level 4 Route: Telecommunications</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
MHH623549	Honours Project Engineering	A/B	40 SHEH
MHH623541	Digital Signal Processing	A	20 SHEH
MHH623542	Digital Design and Computer Architecture	A	20 SHEH
MHH623520	Wireless Communications	B	20 SHEH
MHH620659	System Level Design	B	20 SHEH
<b>Exit Award – BEng (Hons) Electrical and Electronic Engineering</b>			<b>480</b>

<b>EEE BEng Level 4 Route: Mechatronics</b>			
<b>Module No.</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credit</b>
MHH623549	Honours Project Engineering	A	40 SHEH
M3H120320	Engineering Design and Analysis 3	A	20 SHE3
MHH623541	Digital Signal Processing	A	20 SHEH
MHH123523	Computer Aided Design 2	B	20 SHEH
MHH622747	Control Engineering 4 or	B	20 SHEH
MHH623546	Intelligent Robotics and Mechatronics	B	20 SHEH
<b>Exit Award – BEng (Hons) Electrical and Electronic Engineering</b>			

<b>EEE BEng Level 5 Route: Digital Systems</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
MMH723842	MEng Team Project	A/B	45 SHEM
MMI123179	Digital Communications	A	15 SHEM
MMH623671	Embedded Systems Applications 1	A	15 SHEM
MMH623545	Image Processing and Machine Vision	B	15 SHEM
	<b><u>Choose 2 from the following</u></b>		
MMI123176	Real Time DSP	B	15 SHEM
MMI123167	Optical Communications	B	15 SHEM
MMI123173	Fundamentals of Simulation of Computer Networks	B	15 SHEM
<b>Exit Award – MEng Electrical and Electronic Engineering</b>			<b>600</b>

<b>EEE BEng Level 5 Route: Telecommunications</b>			
<b>Module Code</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credits</b>
MMH723842	MEng Team Project	A/B	45 SHEM
MMI123179	Digital Communications	A	15 SHEM
MMH623519	Wireless and Mobile Communications Systems	A	15 SHEM
MMI123176	Real Time DSP	B	15 SHEM
MMI123167	Optical Communications	B	15 SHEM
MMI123173	Fundamentals of Simulation of Computer Networks	B	15 SHEM
<b>Exit Award – MEng Electrical and Electronic Engineering</b>			<b>600</b>

<b>EEE BEng Level 5 Route: Mechatronics</b>			
<b>Module No.</b>	<b>Module Title</b>	<b>Trimester</b>	<b>Credit</b>
MMH623671	Embedded Systems Applications 1	A	15 SHEM
MMH120620	Control Systems	A	15 SHEM
MMH623545	Image Processing and Machine Vision	B	15 SHEM
MMH120622	Industrial Communications and Networks	B	15 SHEM
MMH623670	Condition Monitoring	B	15 SHEM
MMH723842	MEng Team Project	A/B	45 SHEM
<b>Exit Award – MEng Electrical and Electronic Engineering</b>			

<b><u>Notes:</u></b>	
<b>1.</b>	<b><i>Student Exchange (Optional).</i></b> 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.
<b>2.</b>	<b><i>Industrial Placement Year (Optional) Exit Award.</i></b> 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 Glasgow Caledonian University Undergraduate Assessment Regulations can be accessed from:

<http://www.gcu.ac.uk/media/gcalwebv2/theuniversity/gaq/gaqfiles/assessmentregulations/University%20Assessment%20Regulations%202014-15%20Undergraduate.pdf>

The Glasgow Caledonian University Undergraduate Assessment Regulations apply to this programme with exceptions for the Honours Classification Scheme and anticipated updates to the Integrated Masters Progression and Classification Scheme.

### **1) Classification of Honours Award as described in Section 19.7.1**

#### 8.1 Programme Specific Regulations for the Classification of Honours

##### 8.1.1 Award of Honours statement to replace University Regulations Section 19.7.1

The award of Honours will normally be made on the basis of an overall amalgamated aggregate of a student's performance in the modules studied at Level 3 and Level 4 of their programme irrespective of the actual level of any particular module studied at these levels.

This final overall amalgamated aggregate will be determined from:

i) a 25% weighting obtained from an aggregate of the marks for the modules studied at Level 3 of their programme.

and

ii) a 75% weighting obtained from an aggregate of the marks for the modules studied at Level 4 of their programme.

In the case of the amalgamated aggregate falling within the profiling boundaries defined in Section 19.8 the profiling will be based on a calculation set of the Level 4 results only and will follow the model criteria for profiling as defined in Section 19.8.3

### **2) Progression to Final Year of Integrated Masters and Classification Scheme**

#### 8.2 Programme Specific Regulations for Progression to Integrated Masters and Classification Scheme.

Incorporation of specific amendments to the Glasgow Caledonian University Undergraduate Assessment Regulations to allow clarification of criteria for Progression to, and Classification of, Integrated Masters. This proposal was accepted by APC on 3 December 2014 subject to the provision of a transition timetable and the final text being put in place by the Assessment Regulations Working Group (ARWG).

In summary:

Entry to the final year of the Integrated Masters will require an average mark in year 4 of 50% or greater with module pass marks applied where modules are not passed at first attempt or compensated. If this criterion is not met, the student will be eligible to exit with a B.Eng. if they have met the university assessment regulations for a B.Eng. Honours award. All modules must be passed before progression to Integrated Masters.

As the Integrated Masters award is directly tied to the full satisfaction of the Academic Requirements



of the relevant professional body associated with the programme, it is permissible for classification criteria for the Integrated Masters route to be specified at the approval stage (justified by sector norms and professional body requirements) and clearly specified in the programme documentation.

The Integrated Masters should be awarded as pass, merit or distinction, inline with the criteria for postgraduate masters awards. The pass mark for Integrated Masters awards will be 50%.

In the event that amendments are not incorporated then a request for exceptions will be made to address:

1. Module pass marks
2. Recording of marks at second attempt
3. Compensation rules
4. Combinations of exam and coursework elements
5. Essential elements for Professional, Statutory or Regulatory Body requirements
6. Consequential effects of module pass marks
7. Nullification of the results of an assessment of a single module
8. Carrying of modules to Integrated Masters' level
9. Progression to final year of Integrated Masters.