Undergraduate Programme Specification
BEng/BEng (Hons)/MEng Electrical and Electronic Engineering

This specification provides a summary of the main features of the programme and learning outcomes that a student might reasonably be expected to achieve and demonstrate where full advantage is taken of all learning opportunities offered. Further details on the learning, teaching and assessment approach for the programme and modules can be accessed on the University website and Virtual Learning Environment, GCU Learn. All programmes of the University are subject to the University's Quality Assurance processes.

GENERAL INFORMATION				
Programme Title	**BEng (Hons)/MEng** Electrical and Electronic Engineering Electrical and Electronic Engineering (Sandwich)			
Final Award	BEng (Hons) Electrical and Electronic Engineering BEng (Hons) Electrical and Electronic Engineering (Sandwich) MEng Electrical and Electronic Engineering MEng Electrical and Electronic Engineering (Sandwich)			
Awarding Body	Glasgow Caledonian University			
School	School of Computing, Engineering and Built Environment			
Department	Department of Electrical and Electronic Engineering			
Mode of Study	Full-time			
Location of Delivery	Glasgow Campus			
UCAS Code	H610 (BEng) H611 (MEng) H701 (GCU Pathways)			
Accreditations (PSRB)	The Institution of Engineering and Technology (IET)			
Period of Approval	From:	September 2021	To:	August 2027

EDUCATIONAL AIMS OF PROGRAMME
The main aim of the BEng and MEng Electrical and Electronic Engineering programme 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 (Institution of Engineering and Technology) provides partial fulfilment 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.

The BEng/BEng (Hons) EEE programme also aims to:

- provide a broad education by an integrated study of vocational and academic disciplines.
- provide students the benefits of a common first year. A first year provides opportunities to explore specialist options within the general theme of Electrical and Electronic 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 specialist areas.
- 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.

MEng Graduates will have in addition to the BEng:

- the ability to integrate their knowledge and understanding of mathematics, science, computer-based methods, design, the economic, social and environmental context, and

engineering practice to solve a substantial range of engineering problems, some of a complex nature.

- acquired much of this ability through involvement in individual and group projects, and
- greater degree of industrial involvement than those in Bachelor's degree programmes.

LEARNING OUTCOMES

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

The programme learning outcomes are derived from the following sources:

- The Educational Aims of the Programme.
- QAA Engineering Benchmark Statements (Oct 2019).
- Scottish Credit and Qualifications Framework.
- Engineering Council UK Standard for Professional Engineering Competence (UK-SPEC).

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

3A Knowledge and understanding;

A1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

A2 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.

3B Practice: Applied knowledge, skills and understanding;

B1 Apply an integrated or systems approach to the solution of complex problems.

B2 Use practical laboratory and workshop skills to investigate complex problems.

B3 Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.

B4 Discuss the role of quality management systems and continuous improvement in the context of complex problems.

B5 Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.

3C Generic cognitive skills;

C1 Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.

C2 Select and evaluate technical literature and other sources of information to address complex problems.

C3 Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.

3D Communication, numeracy and ICT skills

D1 Communicate effectively on complex engineering matters with technical and non-technical audiences.
D2 Apply their skills in problem solving, communication, information retrieval, working with others and the effective use of general IT facilities.

3E Autonomy, accountability and working with others.

E1 Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts
E2 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct
E3 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity
E4 Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion
E5 Function effectively as an individual, and as a member or leader of a team
E6 Plan and record self-learning and development as the foundation for lifelong learning/CPD.

LEARNING AND TEACHING METHODS

The programme provides a variety of learning and teaching methods. Programme and Module specific guidance will provide detail of the learning and teaching methods specific to each module.

Across the programme the learning and teaching methods and approaches may include the following:

- Lectures
- Seminars
- Practical classes
- Placements
- Simulation experiences
- Groupwork
- Flipped classroom approaches
- Online learning

The above approaches may be delivered either in person or online as appropriate and determined at module level by the Module Leader.

ASSESSMENT METHODS

The programme provides a variety of formative and summative assessment methods. Programme and Module specific guidance will provide detail of the assessment methods specific to each module.

Across the programme the assessment methods may include the following:

- Written coursework (essays, reports, case studies, dissertation, literature review)
- Oral coursework (presentations, structured conversations)
- Practical Assessment (Placement, VIVA, Laboratory work)

- Group work
- Blogs and Wikis
- Portfolio Presentations
- Formal Examinations and Class Tests

The above assessments may be delivered either in person and online as appropriate and determined at module level by the Module Leader.

ENTRY REQUIREMENTS

Specific entry requirements for this programme can be found on the prospectus and study pages on the GCU website at this location: www.gcu.ac.uk/study

All students entering the programme are required to adhere to the GCU Code of Student Conduct.

7. **PROGRAMME STRUCTURE AND AVAILABLE AND FINAL EXIT AWARDS**1						
The following modules are delivered as part of this programme:						
Module Code	**Module Title**	**Core or Optional**	**SCQF Level**	**Credit Size**	**Coursework %**	**Examination %**
M1H326673	Mathematics 1	Core	7	20	50	50
M1H326689	Engineering Science	Core	7	20	50/50	
M1H626685	IoT Systems 1	Core	7	20	50/50	
M1H626678	Engineering for Society	Core	7	20	100	
M1H326677	Mechanical Principles	Core	7	20	100	
M1H626680	Electrical Principles	Core	7	20	100	
M2H326684	Mathematics 2	Core	8	20	50	50
M2G620493	Software Development for Engineers	Core	8	20	50	50
M2H623525	Analogue and Digital Electronics	Core	8	20	50	50
M2H630266	IoT Systems 2	Core	8	20	50/50	
M2H630297	Electrical Distribution Systems AB	Core	8	20	50	50
M2H622325	Control and Instrumentation Systems	Core	8	20	30	70
M3H623544	Digital and Programmable Systems 2	Core	9	20	50	50
M3H623517	Communications Engineering	Core	9	20	30	70
M3H623554	Integrated Engineering Studies 3	Core	9	20	100	
M3H723623	Engineering Operations and Management	Core	9	20	30	70
M3H620587	Signals and Electronic Systems Design	Optional	9	20	30	70
M3H630987	Control Engineering 3	Optional	9	20	100	
M3H623538	Modelling and Data Analysis	Optional	9	20	25/25	50
M2H721926	Engineering Design and Analysis 2	Optional	9	20	30	70
M3H323616	European Exchange Placement (optional)	Optional	9	60	30	70
M3H623747	European Project Semester	Optional	9	60	10/60/30	
M3H721925	Industrial Practice	Optional	9	60	30/70	
MHH630296	EEE Honours Research Project	Core	10	40	70/30	
MHH623541	Digital Signal Processing	Core	10	20	30	70
MHH623542	Digital Design and Computer Architecture	Optional	10	20	50	50
MHH113285	Computer Aided Engineering	Optional	10	20	75/25	
MHH623546	Intelligent Robotics and Mechatronics	Optional	10	20	50	50

MHH623520	Wireless Communications	Optional	10	20	50	50
MHH130997	Computer Aided Design 2	Optional	10	20	30/70	
MHH622747	Control Engineering 4	Optional	10	20	30	70
MMH723842	MEng Team Project	Core	11	45	15/15/50/20	
MMN223676	Strategy and Innovation	Core	11	15	50	50
MMH626812	System Health Management	Core	11	15	70/30	
MMH623545	Image Processing and Machine Vision	Core	11	15	50	50
MMH626242	Advanced Telecommunications	Optional	11	15	50	50
MMH624556	Control Systems	Optional	11	15	30	70
MMI123176	Real Time DSP	Optional	11	15	30	70
MMH623670	Condition Monitoring	Optional	11	15	50	50

Students undertaking the programme on a full-time basis commencing in September of each year will undertake the modules in the order presented above. This may be subject to variation for students commencing the programme at other times of year (e.g. January) and/or undertaking the programme on a part-time or distance learning mode of delivery.

The following final and early Exit Awards are available from this programme[1]:

Certificate of Higher Education in Electronic Technologies - *achieved upon successful completion of 120 credits*

Diploma of Higher Education in Electronic Technologies - *achieved upon successful completion of 240 credits*

Bachelor of Engineering in Electronic Engineering - *achieved upon successful completion of 360 credits*

Bachelor of Engineering with Honours in Electrical and Electronic Engineering - *achieved upon successful completion of 480 credits*

Master of Engineering in Electrical and Electronic Engineering - *achieved upon successful completion of 600 credits*

[1] Please refer to the GCU Qualifications Framework for the minimum credits required for each level of award and the Programme Handbook for requirements on any specified or prohibited module combinations for each award.

ASSESSMENT REGULATIONS
Students should expect to complete their programme of study under the GCU Assessment Regulations that were in place at the commencement of their studies on that programme, unless proposed changes to University Regulations are advantageous to students. These can be found at: https://www.gcu.ac.uk/aboutgcu/services-and-facilities/qualityassuranceandenhancement/regulations-and-policies In addition to the GCU Assessment Regulations noted above, this programme is subject to Programme Specific Regulations in line with the following approved Exceptions: Case No: 215 Details: A maximum of 30 credits in a Bachelors degree programme can be compensated.

VERSION CONTROL (to be completed in line with AQPP processes) **Any changes to the PSP must be recorded below by the programme team to ensure accuracy of the programme of study being offered.**			
Version Number	*Changes/Updates*	*Date Changes/Updates made*	*Date Effective From*
1.0	Transferred to template following module changes: • Module code change – Control Engineering 3 (CE3). New module code is M3H630987 • Module code change – Computer Aided Design 2 (CAD2). New module code is MHH130997	19/06/2026	Sept 2026