Queen Mary
University of London

Programme Specification

Awarding Body/Institution	Queen Mary, University of London
Teaching Institution	Queen Mary, University of London
Name of Final Award and Programme Title	Bachelor of Engineering (BEng) Electronic Engineering
Name of Interim Award(s)	Cert HE, Dip HE, BSc(Eng), BEng
Duration of Study / Period of Registration	3 years FT
QM Programme Code / UCAS Code(s)	H610
QAA Benchmark Group	Engineering
FHEQ Level of Award	Level 6
Programme Accredited by	Institution of Engineering and Technology (IET)
Date Programme Specification Approved	
Responsible School / Institute	School of Electronic Engineering & Computer Science

Schools which will also be involved in teaching part of the programme

N/A

Institution(s) other than Queen Mary that will provide some teaching for the programme

N/A

Programme Outline

This programme covers digital and analogue circuit design, programming, microprocessors and communication systems. Emphasis is placed on systems and the design of digital and analogue circuits using advanced software tools. You may study very-large-scale integration (VLSI), communication systems and digital signal processing (DSP).
A design and build group project is taken in the second year and develops teamworking skills. The final individual project allows you to tackle a topic of your choice in greater depth.

Aims of the Programme

The accredited degrees form a group of programmes with the same broad aims and objectives; the difference being that they address different technical flavours of the broad spectrum that is now Electronic Engineering.

Skill-based aims and objectives are, therefore, common across the family, but the instantiation of these objectives may make use of different technical aspects within the family.

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Programme Title: BEng Electronic Engineering

> Context-based aims and objectives describe the differences between the programmes and Level-based aims and objectives between the BEng and MEng degrees.

What Will You Be Expected to Achieve?

At the end of his/her degree, each student should be able to demonstrate the following abilities:
• the ability to recall factual knowledge and the ability to apply it in familiar and unfamiliar situations;
• the ability to apply scientific, mathematical and software 'tools' to a familiar or unfamiliar situation;
• the ability to use Information Technology as a key tool pervading all aspects of Electronic Engineering;
• the ability to understand practical issues concerning real systems (whether hardware or software);
• the ability to recognise insufficient existing knowledge and the ability to search for the necessary scientific, mathematical and software 'tools' relevant to that particular issue;
• the ability to work as part of a team;
• the ability to manage time effectively;
• the ability to appreciate the financial background against which decisions are made in industry;
• the ability to show a certain level of reflection on the role of engineering in society;
and the following skills:
• the perceptive skills needed to understand information presented in the form of technical circuit-diagrams, flow-charts and high-level languages;
• the practical skills needed to implement a piece of hardware or software and to use laboratory test equipment;
• the analytical skills needed to verify the correct behaviour of a hardware or software system or component and to be able to identify faults;
• the design skills needed to synthesise a design (in hardware and/or software) from a specification (including the choice of the best option from a range of alternatives), to implement the design and to evaluate the design against the original specification;
• the written and oral communication skills needed to present information, in particular written information, effectively;
• the critical reasoning skills needed to appraise a particular topic

Context-based aims and objectives
• To combine a study of digital and analogue circuit design with software applications and microprocessors, and control and communications systems.
• To include the design of VLSI microelectronic chips and some Digital Signal Processing.

Academic Content:	
A 1	Theory, principles, concepts and methodologies fundamental to electronic engineering.
A 2	Role of business processes in engineering, including the commercial, societal and legal processes; moral and ethical issues including professional conduct and intellectual property.

Disciplinary Skills - able to:	
B 1	Demonstrate the comprehension and higher level cognitive skills necessary to solve practical problems of constrained complexity using the fundamental concepts and physical principles that underpin electronic engineering in the key areas of circuits, systems, networks and algorithms.
B 2	Demonstrate a level of software engineering and programming skills that are appropriate to electronic engineering.
B 3	Demonstrate the ability to analyse and evaluate using the appropriate mathematical principles and techniques that underpin the analysis of electronic engineering systems.

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Attributes:	
C 1	Engage critically with knowledge, taking responsibility for own learning and personal and professional development.
C 2	Demonstrate an appropriate level of expertise in the use of information technology.
C 3	Manage time and prioritize tasks by working to strict deadlines while achieving clarity of communication, both with peers and with academic staff.

How Will You Learn?

Each non-project-based module involves lectures, problem solving coursework and practical sessions. Lectures are used to introduce principles and methods and also to illustrate how they can be applied in practice. Coursework allows students to develop their skills in problem solving and to gain practical experience. Practical sessions provide students with guidance and help while solving a problem. These lessons take the form of exercise classes and programming laboratories that allow the students to learn-by-doing in order to complement the lectures.

Individual projects are undertaken throughout the year under the supervision of an academic member of staff with whom there are weekly consultancy meetings. These are used for students to report on their progress, discuss research and design issues and plan their future work. This develops and reinforces students' ability to communicate technical ideas clearly and effectively. The Projects Coordinator also runs a thread of taught sessions to support the project module.

How Will You Be Assessed?

The assessment of taught modules normally consists of a combination of written examination and coursework.

Project modules are normally examined on the basis of a written report, a formal oral presentation, and, where applicable, a demonstration of any software and/or hardware developed.

How is the Programme Structured?

Semester 1
ECS401U Procedural Programming
ECS402U Professional and Research Themes
ECS408U Electronic Engineering Mathematics I
ECS412U Digital Circuit Design

Semester 2
ECS403U Communications and Networks
ECS409U Analogue Electronic Systems
ECS411U Signals and Information
ECS423U Electronic Engineering Maths 2

ECS422U Skills for Electronic Engineering and Computer Science (runs in Sem 1/2. Non credit bearing module)

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Semester 3
ECS501U C Programming
ECS502U Microprocessor Systems Design
ECS517U Electronic Devices & Applications
ECS524U Internet Protocols and Applications

Semester 4
ECS504U Electric and Magnetic Fields
ECS514U Design & Build Project in Electronic Engineering
ECS515U Signals and Systems Theory
ECS525U Telecommunication Systems

Semester 5
ECS625U Project (30 credits)
Plus three of:
ECS601U Control Systems
ECS602U Digital Signal Processing
ECS604U Entrepreneurship in Information Technology
ECS607U Data Mining
ECS615U Digital Systems Design
ECS642U Embedded Systems
ECS643U Power Electronics
ECS644U Microwave and Millimetrewave Electronics
Semester 6
ECS625U Project (contd)
ECS622U Product Development
Maximum one of:
ECS639U Web Programming
ECS637U Digital Media and Social Networks
Plus option(s) from:
ECS617U Integrated Circuit Design
ECS619U Network Planning, Finance and Management
ECS645U Microwave and Millimetrewave Communications Systems
ECS649U Electrical Machine Systems

Academic Year of Study 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Electronic Engineering Maths 2	ECS423U	15	4	Compulsory	1	Semester 2
Embedded Systems	ECS642U	15	6	Elective	3	Semester 1

What Are the Entry Requirements?

Entry requirements
A/AS-levels
Tariff/Grades requirement: BBB(300 points) A-level Mathematics and A-level Physics essential.

Vocational or applied A-levels
Acceptability: Accepted and subject to the above tariff requirements for A/AS-levels. Additional information: Must be in related subject, Electronic Engineering/Engineering/Applied Science.

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BTEC Extended Diploma
Pass with D*DD in Engineering or Applied Science with grade B in A-level Maths.

BTEC Diploma (120 Credit)
Pass with DD in Engineering or Applied Science with grade B in A-level Maths or Science.

BTEC Subsidiary Diploma (60 Credit)
Pass with D*. These qualifications are acceptable ONLY if offered with two appropriate A-levels i.e. Maths/ICT grade B.

HNC
For 1st year entry only. 120 credits at level 4. Must pass with Distinction overall.

HND
2nd year entry may be possible. 240 credits at level 5. Pass with Distinction overall.

Access
Pass with 45 credits in Access in Electrical and Electronics/ Engineering at level 3, of which 30 credits must be Distinction and 15 credits at Merit or Higher. An additional entry maths test will be required if you do not hold A level Mathematics.

International Baccalaureate
Acceptability: Acceptable on its own and combined with other qualifications. Subjects and grades required: 32 points overall. Must include either HL English grade 4 or SL English grade 4 or above. HL Mathematics & Physics must be at least grade 5.

How Do We Listen and Act on Your Feedback?

The Student-Staff Liaison Committee provides a formal means of communication and discussion between the School and its students. The committee consists of student representatives from each cohort, together with appropriate representation from School staff. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Student-Staff Liaison Committees meet four times a year, twice in each teaching semester.

Each semester, students are invited to complete a web-based module questionnaire for each of their taught modules, and the results are fed back through the SSLC meetings. The results are also made available on the student intranet, as are the minutes of the SSLC meetings. Any actions necessary are taken forward by the relevant Senior Tutor, who chairs the SSLC, and general issues are discussed and actioned through the School's Learning and Teaching Committee.

The School's Learning and Teaching Committee advises the Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in this Committee's work in a number of ways, including through student membership and consideration of student surveys and module questionnaires.

The School participates in the College's Annual Programme Review process, which supports strategic planning and operational issues for all undergraduate and taught postgraduate programmes. The APR includes consideration of the School's Taught Programmes Action Plan, which records progress on learning and teaching related actions on a rolling basis. Students' views are considered in the APR process through analysis of the NSS and module questionnaires, among other data.

Academic Support

All students are assigned an academic advisor during induction week. The advisor 's role is to guide their advisees in their academic development including module selection, and to provide first-line pastoral support.

In addition, the School has 2 Senior Tutors for undergraduate students who provide second-line guidance and pastoral support for students, as well as advising staff on related matters.

Every member of teaching staff holds 2 open office hours per week during term-time.

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Programme-specific Rules and Facts

Students must Pass their Final Year Project in order to obtain the BEng. Students who do not Pass their Final Year Project will exit with the BSc(Eng). This is an IET requirement.

Specific Support for Disabled Students

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:
• Finding out if you have a specific learning difficulty like dyslexia
• Applying for funding through the Disabled Students' Allowance (DSA)
• Arranging DSA assessments of need
• Special arrangements in examinations
• Accessing loaned equipment (e.g. digital recorders)
• Specialist one-to-one "study skills" tuition
• Ensuring access to course materials in alternative formats (e.g. Braille)
• Providing educational support workers (e.g. note-takers, readers, library assistants)
• Mentoring support for students with mental health issues and conditions on the autistic spectrum.

Links With Employers, Placement Opportunities and Transferable Skills

The School has a wide range of industrial contacts secured through research projects and consultancy, our Industrial Experience programme and our Industrial Advisory Panel.

The Industrial Advisory Panel works to ensure that our programmes are state-of-the-art and match the changing requirements of this fast-moving industry. The Panel includes representatives from a variety of Computer Science oriented companies ranging from SMEs to major blue-chips. These include: Microsoft Research, IBM, The National Physical Laboratory, National Instruments, PA Consulting, Rohde and Schwarz, O2, Cisco Systems, ARM, Selex and BAE Systems.

Recent graduates have found employment as IT consultants, specialist engineers, web developers, systems analysts, software designers and network engineers in a wide variety of industries and sectors. A number of students also go on to undertake PhDs in electronic engineering and computer science. Merril Lynch, Microsoft, Nokia, Barclays Capital, Logica,, Credit Suisse, KPMG, Transport for London, Sky and Selex ES are among the organizations that have recently employed graduates of EECS programmes.

Transferable skills are developed through a variety of means, including embedding of QM Graduate Attributes in taught modules and the project, together with the opportunity to participate in extra-curricular activities, e.g. the School's E++ Society, the School's Annual Programming Competition and external competitions with support from the School.

Programme Specification Approval

Person completing Programme Specification

Dr. John Schormans

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Programme Title: BEng Electronic Engineering

Person responsible for management of programme	Dr. John Schormans
Date Programme Specification produced/amended by School Learning and Teaching Committee	12 February 2016
Date Programme Specification approved by Taught Programmes Board	

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