

Programme Title: MEng Electronic Engineering and Telecommunications



## Programme Specification

Awarding Body/Institution	Queen Mary University of London
Teaching Institution	Queen Mary University of London
Name of Final Award and Programme Title	Master of Engineering (MEng) in Electronic Engineering and Telecommunications
Name of Interim Award(s)	Cert HE, Dip HE, BEng
Duration of Study / Period of Registration	4 years FT
QM Programme Code / UCAS Code(s)	H690
QAA Benchmark Group	Engineering
FHEQ Level of Award	Level 7
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

These programmes cover the most rapidly growing areas of electronic engineering and all aspects of communications. You will learn about microwave and optical systems as well as the design, operation, and management of large-scale communication networks for computers and voice and video signals. A range of technical and business modules provides a strong engineering foundation to this specialised degree.

### Aims of the Programme

This is one of our MEng programmes, which are integrated masters programmes that include both technical content beyond normal first degree level and additional content on economic, social and environmental issues. In addition, MEng programmes provide enhanced experience of project management in a group activity.

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.

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?

Skill-based aims and objectives:

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 provide a wide coverage of telecommunications systems from physical layer, through network layer to applications.
- To emphasise electromagnetics as the key underlying theoretical base for wireless communications.
- To provide practical skills in electromagnetics.

Level-based aims and objectives

Additional objectives for MEng degree:

- To provide greater technical depth by including 5 modules in the final year from a cognate MSc degree within the school (level 7 modules).
- To provide greater experience of group project working.
- To provide enhanced problem-solving skills through case-study investigations.
- To provide a greater understanding of business and financial matters.

### Academic Content:

A 1	Theory, principles, concepts and methodologies fundamental to electronic and telecommunications 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 and telecommunications 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 and telecommunications engineering.
B 3	Demonstrate the ability to analyse and evaluate using the appropriate mathematical principles and techniques that underpin the analysis of electronic and telecommunications engineering systems.

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.

QMUL Model Learning Outcomes - Level 4:	
D 1	Identify and discuss their own career aspirations or enterprise skills and knowledge and how they impact on others
D 2	Identify and discuss what their own role in their programme and/or subject discipline might mean to them for future
D 3	Consider the role of their discipline in diverse cultural and global contexts

### 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 take the form of problem-solving exercise classes, or programming or hands-on laboratory sessions that use instruments and hardware and software tools. They allow the students to learn-by-doing, and thus complement the lectures. Practical sessions provide students with guidance and help while solving a problem.

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 the taught course units takes place through a written examination and coursework.

The final year project is examined on the basis of a written report, a formal oral presentation, and a demonstration of the piece of software or hardware developed by the student. In addition to the final year project, other modules introduce project and group working skills.

### How is the Programme Structured?

Please specify the full time and part time programme diets (if appropriate).

#### Year 1 Modules

##### Semester 1

ECS401U Procedural Programming (15 credits)  
ECS408U Electronic Engineering Mathematics I (15 credits)  
ECS412U Digital Circuit Design (15 credits)  
ECS427U Professional and Research Practice (15 credits)

##### Semester 2

ECS403U Communications and Networks (15 credits)  
ECS409U Analogue Electronic Systems (15 credits)  
ECS411U Signals and Information (15 credits)  
ECS423U Electronic Engineering Mathematics 2 (15 credits)

##### Semester 1 and 2

ECS422U Skills for Electronic Engineering and Computer Science (non-credit bearing module)

#### Year 2 Modules

##### Semester 3

ECS501U C Programming (15 credits)  
ECS502U Microprocessor Systems Design (15 credits)  
ECS517U Electronic Devices and Applications (15 credits)  
ECS525U Telecommunication Systems (15 credits)

##### Semester 4

ECS504U Electric and Magnetic Fields (15 credits)  
ECS514U Design and Build Project in Electronic Engineering (15 credits)  
ECS515U Signals and Systems Theory (15 credits)  
ECS527U Digital Systems Design (15 credits) (pre-requisite for ECS617U from 2018/19)

#### Year 3 Modules

##### Semester 5

ECS626U Team Project (30 credits)  
ECS644U Microwave and Millimetrewave Electronics (15 credits)  
Plus two modules from:  
ECS601U Control Systems (15 credits)  
ECS602U Digital Signal Processing (15 credits)  
ECS607U Data Mining (15 credits)  
ECS615U Digital Systems Design (15 credits) (pre req ECS617U for 2017/18 only and from 2018/19 ECS527U)  
ECS639U Web Programming (15 credits)  
ECS642U Embedded Systems (15 credits)  
ECS643U Power Electronics (15 credits)

##### Semester 6

ECS626U Team Project (cont) (30 credits)  
ECS619U Network Planning, Finance and Management 15 credits)  
Plus two modules from:  
ECS617U Integrated Circuit Design (15 credits) (pre-req ECS615U only for 2017/18 and from 2018/19 ECS527U)  
ECS622U Product Development (15 credits)  
ECS637U Digital Media and Social Networks (15 credits)  
ECS645U Microwave and Millimetrewave Communications Systems (15 credits)  
ECS649U Electrical Machines and Systems (15 credits)

ECS654U Advanced Control Systems (15 credits)

Final Year Modules

Semester 7

ECS770U Project (30 credits)

Plus at least one module from:

ECS702U Mobile and WLAN Technologies (15 credits)

ECS703U 21st Century Networks (15 credits)

Plus one or two modules from:

ECS701U Communication Theory (15 credits)

ECS707U Fundamentals of DSP (15 credits) (If not taken as ECS602U in Semester 5)

ECS708U Machine Learning (15 credits)

ECS709U Introduction to Computer Vision (15 credits)

ECS782U Introduction to IOT (15 credits)

ECS783U Enabling Communication Technologies for IOT (15 credits)

IPLM701U Introduction to Law for Science and Engineering (15 credits) (pre req for IPLM702U)

Semester 8

ECS770U Project (30 credits)

Plus three modules from:

ECS724U Network Modelling and Performance (15 credits)

ECS725U Mobile Services (15 credits)

ECS726U Security and Authentication (15 credits)

ECS728U Business Technology Strategy (15 credits)

ECS734U Techniques for Computer Vision (15 credits)

ECS721U Next Generation Mobile (15 credits)

IPLM702U Foundations of Intellectual Property Law and Management (15 credits) (must have taken IPLM701U)

### QMUL Model

Students are required to undertake the equivalent of one module (15 credits in 2017/18) per year of study which has been identified as meeting the requirements of the QMUL Model. Each of these modules has been designed to combine the best of QMUL's academic excellence with your ability to identify and develop your skills, networks and experience. This will help to ensure you become a graduate who can undertake further study or secure graduate employment in areas that interest you, and will support your ability to position yourself to find the right job or opportunity for you. The relevant module for your first year of study in 2017/18 is indicated below.

Where more than one module is specified, this is because pertinent elements from these modules have been identified as being appropriate to the QMUL Model and when studied together, deliver the equivalent content of one 15-credit QMUL Model module.

The QMUL Model modules for future years and associated Learning Outcomes will be identified as your studies continue.

Should Professional, Statutory and Regulatory Body requirements apply to your programme of study, these will be taken into account in the specification of QMUL Model requirements.

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
			4	Compulsory	1		<input type="checkbox"/> Yes

### What Are the Entry Requirements?

General entry requirements

- A-levels: 3 A-levels AAB from 3 A levels incl A level Maths/Physics/Biology/Chemistry/Computing/Electronics
- BTEC Extended Diploma : D\*D\*D\*. A level Maths grade B required if no A level Maths must sit EECS Maths test.
- International Baccalaureate: We require a minimum of 34 points overall. Subjects must include HL Mathematics and Physics at least 6 points.
- Access to HE Diploma: Pass with Access in Electrical and Electronic Engineering. Must incl 45 credits at level 3, of which 30 credits must be distinction and 15 credits at merit or higher. A level maths required. Test if applicant has no A level Maths test.
- European and international qualifications: The College accepts a wide range of EU and International qualifications, for information please contact the School.
- Other qualifications: The College welcomes applications from those holding qualifications not listed above. The School will be happy to advise you as to the acceptability of your qualification.

Specific programme entry requirements

- A level Mathematics grade B or higher required.

International students - English Language entry requirements

For international students, English Language skills are required to a recognised standard. The minimum requirement is IELTS 6.0 or equivalent.

### How Do We Listen and Act on Your Feedback?

The Staff-Student Liaison Committee provides a formal means of communication and discussion between Schools and its students. The committee consists of student representatives from each year in the school/institute together with appropriate representation from staff within the school/institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Staff-Student Liaison Committees meet regularly throughout the year.

Each school operates a Learning and Teaching Committee, or equivalent, which advises the School/Institute 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, such as through student membership, or consideration of student surveys.

All schools operate an Annual Programme Review of their taught undergraduate and postgraduate provision. The process is normally organised at a School-level basis with the Head of School, or equivalent, responsible for the completion of the school's Annual Programme Reviews. Schools/institutes are required to produce a separate Annual Programme Review for undergraduate programmes and for postgraduate taught programmes using the relevant Undergraduate or Postgraduate Annual Programme Review pro-forma. Students' views are considered in this process through analysis of the NSS and module evaluations.

### Academic Support

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

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

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The School also has a Student Support Officer who is the first point of contact regarding all matters.

Every member of Teaching Staff holds 2 open office hours per week during term time.

### Programme-specific Rules and Facts

See Academic Regulations, [www.arcs.qmul.ac.uk](http://www.arcs.qmul.ac.uk)

### 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 programme is scrutinised by a School Industrial Advisory Panel. The Panel meets annually to discuss research and teaching matters pertinent to our field.

Vodafone and Juniper Networks both come in and give guest lectures to students on our ELEM005 module.

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## Programme Specification Approval

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Person completing Programme Specification

Tijana Timotijevic

Programme Title: MEng Electronic Engineering and Telecommunications

**Person responsible for management of programme**

Tijana Timotijevic

**Date Programme Specification produced/amended  
by School Learning and Teaching Committee**

15th June 2017

**Date Programme Specification approved by  
Taught Programmes Board**