

PROGRAMME SPECIFICATION – UNDERGRADUATE PROGRAMMES

KEY FACTS

Programme name	MEng Electrical & Electronic Engineering / MEng Electrical & Electronic Engineering with Placement
Award	MEng (Hons)
School	School of Mathematics Computer Science and Engineering
Department or equivalent	Department of Electrical and Electronic Engineering
UCAS Code	H604/H605
Programme code	USELEM
Type of study	Full Time
Total UK credits	480
Total ECTS	240

PROGRAMME SUMMARY

The MEng (Honours) programme in Electrical and Electronic Engineering is a four-year Master Undergraduate Programme. The main aim of the Programme is to produce graduates who are equipped to play leading roles in the electrical engineering industry, the professions and public service.

The Programme consists of four Programme Stages (years), each contributing 120 credits to the final degree. The programme shares Programme Stage 1 and Programme Stage 2 with the BEng programmes in Electrical and Electronic Engineering, Computer Systems Engineering and Telecommunications. You can transfer to/from this programme to the listed BEng programmes only at the end of Programme Stage 2.

You are required to successfully complete each year of study before progressing to the next year. Each academic year is typically delivered over 20 contact weeks, five examination weeks, and five reflective learning weeks. This is a full time study programme, with optional placement year. The placement year occurs between Programme Stage 2 and Programme Stage 3, or Programme Stage 3 and Programme Stage 4 of the programme. It carries no academic credit but is highly recommended to you because you will be working in a professional place related to your course of studies and you will be able to establish contacts with industry for your project work after you return to university and for working opportunities in the future.

Certificate / Programme Stage One

For all of you completing Programme Stage one *or* the Certificate in Electrical and Electronic Engineering you will be able to discuss underlying concepts and principles associated with electronics, design and computing and interpret these within the context of your practice. Subjects covered include modules in engineering mathematics, engineering practice, introduction to programming, circuit theory, analogue electronics, digital logic, and signals and systems.

Diploma / Programme Stage Two

For all of you completing Programme Stage Two *or* the Diploma in Electrical and

Electronic Engineering you will build on your previous knowledge and experience. You will develop skills of enquiry in your subject and develop different approaches to problem-solving as well as identify the limitations of your knowledge. Modules include further engineering mathematics, numerical computing, analogue and digital electronics, computer programming, communications systems, dynamics and control, and engineering management.

BEng Degree / Programme Stage Three

For all of you completing Programme Stage Three you will further develop a coherent systematic, detailed knowledge of your discipline. You will be able to develop techniques for practice drawing on research and scholarship demonstrating your role as a reflective practitioner. Programme Stage 3 includes individual project work and a range of specialised modules in electrical and electronic power systems, embedded real-time systems, signal processing, and engineering systems.

MEng (Honours) / Programme Stage Four

For all of you completing the MEng (Honours) Degree Programme Stage Four of the programme you will have extended your knowledge related to Electrical and Electronic Engineering by exploring this from different perspectives which will have broadened your expertise and skills. Your ability to continue to evaluate current evidence in Electrical and Electronic Engineering enables you to develop some originality in your practice and approach scholarly activity. In Programme Stage 4 you will develop essential skills in advanced design group work and advanced knowledge in principle areas of Electrical and Electronic Engineering. You will be given a choice of modules which enables you to specialise in your preferred field of Electrical and Electronic Engineering. Such modules (of which you chose four) are renewable energy fundamentals and sustainable energy technologies, advanced electronics, power electronics, systems modelling, control systems design, digital communications, telecommunication systems, transmission and distribution systems management, and lasers and optoelectronics.

Classroom-based learning, practical work, tutorials and clinics, project work, site visits, research and private study are used in all years and key skills are assessed both by examination and by continuous assessment (coursework) for all types of engineering practice. The split between examination and coursework assessment varies in the modules in the programme, with most modules having 70/30 ratio, although a number of modules are assessed by continuous assessment only.

Aims

- produce graduates who have a greater breadth and focused depth of knowledge and understanding of Electrical and Electronic Engineering area;
- provide a broader knowledge of technical engineering subjects appropriate to Masters level education;
- enable you to undertake and complete a major piece of independent research work on a given topic at a level appropriate to a Masters degree;
- enable you to tackle complex engineering issues and problems by applying knowledge and understanding (with a higher level of confidence) innovatively and proactively giving leadership in team situations, as appropriate;
- produce graduates who are equipped to play the leading roles in industry,

professions and public service nationally and/or internationally ;

- provide an extensive knowledge and practical understanding of engineering management and business practices;
- develop effective communication and interpersonal skills appropriate to engineers at Masters level;
- provide extended management skills and develop an ability to function as an effective member of a multi-disciplinary team, exercising and developing leadership skills.

WHAT WILL I BE EXPECTED TO ACHIEVE?

On successful completion of this programme, you will be expected to be able to:

Knowledge and understanding:

- demonstrate a comprehensive understanding of the scientific principles of Electrical and Electronic Engineering and related disciplines;
- demonstrate an awareness of developing technologies related to Electrical and Electronic Engineering;
- apply the fundamental concepts, principles and theories relevant to Electrical and Electronic Engineering;
- demonstrate and apply detailed and comprehensive knowledge and understanding of the essential facts, concepts, principles and theories of electronic design, signals, computer systems, control engineering and communication systems.;
- demonstrate and apply fundamental concepts of general principles of design and design techniques, and wide knowledge and comprehensive understanding of the design process applicable to engineering in general and to Electrical and Electronic Engineering in particular;
- demonstrate a comprehensive knowledge and understanding of mathematical and computer models relevant to the engineering discipline, and an appreciation of their limitations;
- understand and apply the role of the engineer in society and the business and management techniques that are relevant to engineering and electrical engineers; an extensive knowledge and understanding management and business practices and their limitations;
- acquire fundamental concepts and principles of IT and Communications (ITC) relevant to Electrical and Electronic Engineering, and a comprehensive knowledge and understanding of the role and limitations of ITC;
- demonstrate knowledge of Mathematics and Physics that are relevant to Electrical and Electronic Engineering;

Skills:

- analyse and solve problems relevant to Electrical and Electronic Engineering;
- formulate and test hypotheses relevant to Electrical and Electronic Engineering;
- design and/or model systems and processes using sound principles of electronics, communications, control, instrumentation and IT;
- exercise critical evaluation of information accessed from a wide variety of sources

including the literature, the Internet, scientific databases, technical reports and data sheets;

- exercise professional judgement while taking into account non-technical economic and social issues;
- use scientific principles in the development of Electrical and Electronic Engineering solutions to practical problems;
- select and apply appropriate computer based methods for modelling and analysis of engineering problems;
- work effectively as part of a team and demonstrate the ability to exercise leadership in a team situation;
- generate and innovate design for systems and sub-systems to satisfy new needs;
- plan and perform safely experimental work in a laboratory environment;
- use test and measurement equipment; take accurate measurements and record progress of an experiment in a laboratory book and computer database. Use scientific literature effectively.
- analyse and critically evaluate modelling and experimental results both qualitatively and quantitatively. Prepare technical reports and give technical presentations using a variety of information sources and constructed using appropriate computer tools and packages;
- use scientific literature effectively, research for information to develop idea further, and use new information/methods required for novel situations;
- communicate effectively both verbally and in writing;
- learn to adapt to new or unfamiliar situations and technologies, and use fundamental knowledge to investigate new and emerging technologies;
- apply engineering approach to the solution of substantial range of engineering problems taking into account commercial and industrial constraints;
- model and/or design systems, sub-systems or processes, some of a complex nature, using sound principles of electronic, communications and control engineering;
- exercise critical evaluation of information accessed from a wide variety of sources (the Internet, scientific databases, technical reports and data sheets);
- work effectively with IT tools - to program and to use computational packages for modelling, design and simulation; recognise the capabilities and limitations of these tools for engineering;
- demonstrate effective and productive use of time and resource management, various aspects of project management, and ability to work and learn independently;
- manipulate and sort appropriate data sets from a range of data and present them in a variety of ways for deeper understanding and/or greater impact.

Values and attitudes:

- Maintain and develop a professional engineering attitude;
- Maintain and develop an awareness of safety and environment;
- Show respect and tolerance for other people on the group;
- Correctly reference the work of other people;
- Show consideration for the rules and regulations of the University;

- Maintain and develop leadership qualities and professional engineering attitude.

This programme has been developed in accordance with the QAA Subject Benchmark for Engineering.

HOW WILL I LEARN?

The programme is designed to provide you with both increased breadth and focused depth of knowledge and understanding of Electrical and Electronic Engineering area. This is assured by a diverse and carefully planned teaching and learning styles based upon lectures, tutorials, practical work and design projects.

Taught modules are designed to provide the bulk of the formal teaching of mathematical and subject-specific engineering subjects. A significant proportion of study time is through private study. Engineering is a practical discipline which cannot be learnt just in the classroom. The contact hours for a typical 15-credit taught module comprises lectures, problem solving, example and revision classes, and coursework and laboratory classes. The laboratory work runs in parallel with the taught modules. This work provides you with engineering skills appropriate for Electrical and Electronic engineers. In laboratories, you will be supervised by academic staff with support from research students and technicians.

Based on the firm foundation of basic/detailed knowledge and understanding of various aspects of the subject area, and practical and transferable skills developed in Programme Stages 1 and 2, the enhanced knowledge and understanding and its practical application are assured through appropriate curriculum design in Programme Stages 3 and 4.

Increased breadth and depth of knowledge and understanding is assured by providing appropriate core and a wide choice of elective modules, all at M level, in Programme Stages 3 and 4. In addition, industrial relevance and breadth of study is provided by study of engineering management (at all Programme Stages) and industrial topics, and by doing enhanced industrially-relevant group and individual projects. The individual project combines the skills and knowledge obtained in the Programme. You are encouraged to present the design process and perform comprehensive testing of the developed application and analyse in detail the existing technological solutions.

An enhanced programme of Engineering Management in Programme Stages 3 and 4 provides you with extensive knowledge and understanding of business practices in the engineering profession, including project management, time management, supply chain, enterprise management. These may be further enhanced by a year placement in industry through a sandwich option supported by the programme (UCAS code H605). An enhanced capability for independent learning and work, and self-management is fostered through major group and individual projects and design work in Programme Stages 3 and 4.

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessment and Assessment Criteria

Assessment of your knowledge, skills and understanding is based on the usual range of assessment methods: written examinations, formal laboratory reports, technical reports and essays, class tests and oral presentations of project or software development work. All individual and group projects in Programme Stages 3 and 4 are assessed through substantial written report, presentation and oral examination.

The Programme consists of four Programme Stages. Each Programme Stage is delivered in one full academic year and totals 120 academic credit points. Each Programme Stage consists of route core modules, which are listed elsewhere in the Programme Specification. In Programme Stage four there is a number of elective modules. The students make selection of the elective modules at the start of the fourth academic year. Majority of the modules has at least two independent assessments (typically a written examination and a coursework). Pass mark for all assessment is 40% for all modules except for Master level modules where pass mark is 50%.

Assessment Criteria will be made available to you to support you in completing assessments. These may be provided in programme handbooks, module specifications, on the virtual learning environment or attached to a specific assessment task.

Feedback on assessment

The feedback is essential for you to evaluate the quality of your work and to develop your skills, both in terms of knowledge and understanding and in terms of presentation. Feedback will be provided for each assessment component for each module. Depending on the assessment method and criteria, the feedback will be a combination of immediate feedback (in the case of oral presentations), detailed written feedback (in the case of written coursework assignments), or by providing model answers and discussing these (in the case of written examinations). Feedback on assessment is considered to be an essential method of the development of student's ability to complete the Programme.

Feedback on your work will be provided in a number of ways. Each module has practical component and you will receive immediate feedback on your work in the laboratories. Feedback will also be given on all your written assignments. You will normally be provided with feedback within three weeks of the submission deadline or assessment date. This would normally include a provisional grade or mark. For end of module examinations or an equivalent significant task (e.g. an end of module project), feedback will normally be provided within four weeks. The timescale for feedback on final year projects or dissertations may be longer. The full policy can be found at:

https://www.city.ac.uk/_data/assets/pdf_file/0008/68921/assessment_and_feedback_policy.pdf

Assessment Regulations

In order to pass your Programme, you should

- complete successfully or be exempted from the relevant modules and assessments and will therefore acquire the required number of credits. Credits are obtained by satisfying the module requirement by achieving more than the pass marks
- obtain an aggregate module mark of at least 50% in Programme Stage 2 and Programme Stage 3 of your Programme. This condition is an IET requirement in order to maintain your place in the MEng Programme. For more specific information look at section “What Will I Study?”

You also need to pass each Programme Stage of your Programme in order to progress to the following Programme Stage. The Programme Stages are weighted to calculate the final degree classification – the weights are presented elsewhere in this specification.

The pass mark for each module is 40%, except for Masters level modules (EEM and EPM modules What Will I Study? section) where pass mark is 50%. To pass a module, you need to obtain at least 40% mark in all the components of the module (50% for Masters level modules). The only exception to this is engineering mathematics. Details of progression for engineering mathematics can be found in the module specifications.

If you fail an assessment component or a module, the following will apply:

1. Compensation: where you fail up to a total of one sixth of the total credits of a Programme Stage at first or resit attempt, you may be allowed compensation if:
 - Compensation is permitted for the module involved (see the What will I Study section of the programme specification), and
 - It can be demonstrated that you have satisfied all the Learning Outcomes of the modules in the Programme Stage, and
 - A minimum overall mark of no more than 10% below the module pass mark has been achieved in the module to be compensated, and
 - An aggregate mark of 40% has been achieved for the Programme Stage (50% for Programme Stage 4).

Where you are eligible for compensation at the first attempt, this will be applied in the first instance rather than offering a resit opportunity.

If you receive a compensated pass in a module you will be awarded the credit for that module. The original component marks will be retained in the record of marks and your original module mark will be used for the purpose of your Award.

2. Resit: Where you are not eligible for compensation at the first attempt, you will be offered one resit attempt.

If you are successful in the resit, you will be awarded the credit for that module. The mark for each assessment component that is subject to a resit will be capped at the pass

mark for the module. This capped mark will be used in the calculation of the final module mark together with the original marks for the components that you passed at first attempt.

If you do not meet the pass requirements for a module and do not complete your resit by the date specified you will not progress to the next Programme Stage and the Assessment Board will require you to be withdrawn from the Programme.

If you fail to meet the requirements for a particular Programme Stage or the Programme, the Assessment Board will consider whether you are eligible for an Exit Award as per the table below.

If you would like to know more about the way in which assessment works at City, please see the full version of the Assessment Regulations at:

http://www.city.ac.uk/_data/assets/word_doc/0003/69249/s19.doc

WHAT AWARD CAN I GET?

Master of Engineering with Honours:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	0
2	5	120	25
3	6	120	37
4	7	120	38

Class	% required
I	70
II upper division	60
II lower division	50

Bachelor's Degree with Honours:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	0
2	5	120	33
3	6	120	67

Class	% required
I	70
II upper division	60
II lower division	50
III	40

Ordinary Degree:

Programme Stage	HE Level	Credits	Weighting (%)
1	4	120	0
2	5	120	33
3	6	60	67

Class	% required
With Distinction	70
With Merit	60
Without Classification	40

Diploma of Higher Education:

Programme Stage	HE Level	Credits	Weighting (%)
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Class	% required
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1	4	120	33	With Distinction 70 With Merit 60 Without 40 Classification	
2	5	120	67		
<u>Certificate of Higher Education:</u>					
Programme Stage	HE Level	Credits	Weighting (%)	Class	% required
1	4	120	100	With Distinction 70 With Merit 60 Without 40 Classification	

WHAT WILL I STUDY?

Programme Stage 1

To pass Programme Stage 1, you must have acquired 120 credits as specified in Programme Stage 1 of the Programme Specification. Programme Stage 1 consists of 7 compulsory modules totalling 120 credit points.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Engineering Science	EE1427	15	C	Y	4
Engineering Practice	EE1500	10	C	Y	4
Digital Logic	EE1501	15	C	Y	4
Electronic Circuit Design 1	EE1502	30	C	N	4
Programming and Design	EE1503	15	C	Y	4
Systems, Modelling and Control	EE1504	15	C	Y	4
Engineering Mathematics 1	EX1001	20	C	N	4

Programme Stage 2

Programme Stage 2 consists of 8 compulsory modules totalling 120 credit points. To pass Programme Stage 2 and maintain your place on the course, you must have acquired 120 credits, an aggregate mark of at least 50% (IET requirement), and have successfully completed the professional placement, if applicable. If you acquire 120 credit points in MEng Programme Stage 2 but your aggregate mark is less than 50% you will be transferred to Programme Stage 3 of the BEng in Electrical and Electronic Engineering Programme.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Dynamics and Control	EE2401	15	C	Y	5
Communication Systems	EE2402	15	C	Y	5
Object-Oriented Programming	EE2425	15	C	Y	5

Analogue Electronics	EE2514	15	C	Y	5
Digital Electronics	EE2507	15	C	Y	5
Numerical Computing and Statistics	EE2512	10	C	Y	5
Engineering Management 2	ET2052	15	C	Y	5
Engineering Mathematics 2	EX2003	20	C	N	5

Professional Placement	ET2014
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Programme Stage 3

Programme Stage 3 consists of 6 core modules and the substantial Individual MEng3 project (30 credits) totalling 120 credits. To pass Programme Stage 3, you must have acquired 120 credits and an aggregate mark of at least 50% (IET requirement), and have successfully completed the professional placement, if applicable. If you fail to meet the requirements for MEng Programme Stage 3, having exhausted all resit opportunities then you may, at the discretion of the appropriate Assessment Board, be allowed credit towards a Bachelor of Engineering Degree for studies undertaken on the MEng Degree programme. If you meet the requirements for MEng Programme Stage 3 you may be awarded a BEng (Honours) degree, if you wish. In that case the MEng 3 modules will be shown in your final transcript with the acquired marks and credits.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Embedded and Real Time Systems	EE3422	15	C	Y	6
Electric and Magnetic Fields	EE3520	15	C	Y	6
Signal Processing	EE3502	15	C	Y	6
Electrical and Electronic Power Systems	EE3503	15	C	Y	6
MEng Individual Design Project	EEM400	30	C	N	7
Engineering Systems, MEng 3	EEM507	15	C	Y	7
Engineering Management 3	ET3051	15	C	Y	6

Programme Stage 4

Programme Stage 4 consists of two core modules totalling 30 credits, one 30 credit elective module and four elective modules of 15 credits each. Selection of elective modules is subject to timetabling constraints.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Engineering Management 4 [Professional, Industrial and Management Studies (PIMS)]	ETM051	15	C	Y	7
MEng Group Design Project	ETM067	30	E	N	7

MEng Group Design Project (Biomedical Engineering)	ETM070	30	E	N	7
MEng Design Studies – Formula Student	ETM063	30	E	N	7
MEng Design Studies - EGPR	ETM066	30	E	N	7
MEng Individual Research Project	ETM068	15	C	N	7
Renewable Energy Fundamentals and Sustainable Energy Technologies	EPM879	15	E	Y	7
Telecommunication Systems	EEM508	15	E	Y	7
Power Electronics	EPM501	15	E	Y	7
Systems Modelling	EPM744	15	E	Y	7
Advanced Electronics	EEM509	15	E	Y	7
Control Systems Design	EPM749	15	E	Y	7
Digital Communications	EPM753	15	E	Y	7
Transmission and Distribution Systems Management	EPM875	15	E	Y	7
Lasers and Optoelectronics	EPM911	15	E	Y	7

TO WHAT KIND OF CAREER MIGHT I GO ON?

The knowledge and the skills you will gain by completing this programme will enable you to gain a range of jobs in a number of industries, including the energy, telecommunications, digital media and financial industries. Our graduates have excellent problem-solving, team-working and communication skills which makes them very attractive to modern interdisciplinary engineering companies.

Having the MEng degree presents you with a significant advantage compared to the holders of a BEng degree, as employers can appreciate the benefit of additional specialized education and the experience you have gained during the group and Individual design projects.

In addition to this, our Master-level graduates are well received at major Universities in the United Kingdom and overseas, where they pursue Doctorate courses in electrical and electronic engineering, control engineering, telecommunications, but also in software engineering and business and management studies.

City, University of London has excellent reputation for graduate employment. Students receive excellent support for industrial placement and careers throughout their studies and after they graduate. If you would like more information on the Careers support available at City, please go to:

<http://www.city.ac.uk/careers/for-students-and-recent-graduates>.

WHAT STUDY ABROAD OPTIONS ARE AVAILABLE?

At present these options are not available; they are still under development

WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?

A valid placement is a period of Employment of at least six months full-time or equivalent in a role related to your course. The placement year occurs between Programme Stage 2 and Programme Stage 3, or Programme Stage 3 and Programme Stage 4 of the programme. You will be visited at least twice during the placement period, either by the Industrial Tutor or your Personal Tutor. The first visit should ideally take place within six weeks of the start of the placement and the second visit within six weeks of the end of the placement.

You will be helped by your Personal Tutor to arrange an industrially-linked final-year project with the Employer (where practical). You are required to organize the visits and send your Personal Tutor a summary of your current role within the placement company. You will also be required to submit a brief technical report upon your return to University and give a short presentation to your Personal Tutor and second-year Students. Currently the placement students receive an endorsement on their degree. There is no Academic credit assigned to the placement year.

WILL I GET ANY PROFESSIONAL RECOGNITION?

Accrediting Body: The Institute of Engineering and Technology

Nature of Accreditation

Accreditation of the MEng leads to fulfilment of the educational requirements for registration as a Chartered Engineer (CEng).

Accrediting Body: The Institute of Measurement and Control

Nature of Accreditation

Accreditation of the MEng leads to fulfilment of the educational requirements for registration as a Chartered Engineer (CEng).

HOW DO I ENTER THE PROGRAMME?

Typical offers (mathematics required):

A/AS-level: 360 UCAS tariff points, including 'A' Level Mathematics at grade A or higher and at least one 'A' level in a science subject, preferably Physics or Electronics.

IB: 35, including 5 in high level maths and physics.

RPL/RPEL

Direct entry into Programme Stage 2: direct entry into Programme Stage 2 is possible following successful completion of Programme Stage 1 of a comparable accredited MEng (Honours)/BEng (Honours) programme.

Suitable equivalent overseas qualifications are also considered. However, in all cases the final decision is subject to the satisfactory evaluation of prior qualifications by the Admissions Tutor.

English language requirements:

IELTS: 6.0 with a minimum of 6.0 in the writing sub-test

GCSE: English language grade C.

Please note that TOEFL is not accepted as evidence of English language ability for students that require a Confirmation of Acceptance for Studies.

Candidates successfully completing City and Islington College Foundation course H606 with City are permitted to enter Programme Stage 1 of the programme if they achieve average mark of 75%.

This programme shares Programme Stage 1 and Programme Stage 2 with BEng Electrical and Electronic Engineering, BEng Computer Systems Engineering and BEng Telecommunications at City, University of London. Transfer will be allowed to those students who have acquired 120 credits and have obtained aggregate mark of at least 60% in Programme Stage 2 of their BEng studies.

Scholarships

A range of scholarships are on offer for home and overseas students. Scholarships are awarded mostly on academic merit. A range of awards is given to students with best academic results.

Details of scholarships available to new undergraduate students can be found on the University's website at <http://www.city.ac.uk/study/why-study-at-city/fees-and-finance/scholarships>.

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