

PROGRAMME SPECIFICATION – UNDERGRADUATE PROGRAMMES

KEY FACTS

Programme name	BEng Electrical & Electronic Engineering with Foundation Year
Award	BEng (Hons)
School	School of Mathematics Computer Science and Engineering
Department or equivalent	Department of Electrical and Electronic Engineering
UCAS Code	H606
Programme code	USELEF
Type of study	Full Time
Total UK credits	480
Total ECTS	240
Partner (partnership programme only)	Foundation Year delivered at City and Islington College
Type of Partnership	Franchised

PROGRAMME SUMMARY

This programme, which is only offered full time, starts with a Year 0 foundation year that provides the essential mathematical and scientific background necessary to progress to Programme Stage 1 of the BEng programme in either Electrical and Electronic Engineering or any other BEng degree in similar subject areas within the department. The foundation year is studied at City and Islington College near the Angel station at a short walk distance from City. The BEng programme is divided into three Programme Stages (Programme Stages 1, 2 and 3), each occupying a full academic year.

The entry point to the BEng programme with foundation year is at the start of the foundation year. If you reach the required level at the end of the foundation year you can transfer to Programme Stage 1 of the BEng in Electrical and Electronic Engineering programme or any of the other BEng Engineering programmes offered in the department of Electrical and Electronic, City, University of London. If you obtain a Programme Stage 2 aggregate mark of 60%, or higher, you have the option of transferring to the MEng (Hons) degree.

The core topics studied in the foundation year are Mathematics, Electrical Principles, and Science. You also study Computing and IT and undertake a programme of laboratory tests at City.

The BEng in Electrical and Electronic Engineering is a three year Bachelors Undergraduate Programme. The main aim of the programme is to provide you with knowledge and practical skills which will equip you to play leading roles in the electrical engineering industry, the professions and public service. As a graduate of this programme you will have the knowledge and skills in a range of fields including engineering mathematics, electronic circuit design, signal processing, electrical power systems, engineering management, control engineering, embedded and real-time

systems design, and computer programming.

The programme consists of 360 academic credits spread over three full academic years (120 credits each year). You are required to successfully complete each year of study before progressing to the next year. The programme includes an optional placement year, which carries no academic credit but is it strongly recommended to you. Each academic year consists of a number of modules (seven, or eight), which typically carry 15 or 30 credits. You will learn at formal lectures, at tutorials and problem solving sessions, and in laboratory sessions. Modules are assessed using the typical range of assessment methods; majority of the modules are assessed through written examination and practical work. The programme includes individual and group project work and gives you the opportunity to develop your personal, presentation and communication skills.

The programme shares Programme Stage 1 and Programme Stage 2 with the MEng programme in Electrical and Electronic Engineering, and with the BEng programmes in Computer Systems Engineering and Telecommunications. You can transfer to/from this programme to the above listed MEng/BEng programmes at the end of Programme Stage 2.

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, analogue and digital electronics, computer programming, communications systems, dynamics and control, and engineering management.

Degree / Programme Stage Three

For all of you completing Programme Stage Three *or* the degree 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. You will cover subject areas in electrical and electronic power systems, embedded real-time systems, signal processing and engineering systems and will also undertake an individual final year project.

The programme is delivered by the School of Mathematics Computer Science and Engineering. It is accredited by the Institute of Engineering and Technology and the Institute of Measurement and Control as partially meeting the Engineering Council UK educational requirements for Chartered Engineer registration.

Aims

The programme aims to produce graduates who:

- are equipped to play leading roles in the electrical engineering industry, the professions and public service;
- have a sound theoretical and practical education in electrical and electronic engineering and will qualify for the membership of professional institutions
- are able to meet the needs of industry and commerce in electrical and electronic engineering by providing distinctive courses which reflect the demand for qualified graduates and by teaching appropriate engineering design concepts;
- are able to undertake and complete a major piece of independent work on a given topic in the electrical engineering field;
- have the ability to reflect specialisations and topical subjects in electrical engineering based on the teaching and research strengths of the School;
- can develop the ability to adapt to new technology relevant to electrical engineering and to seek and assimilate new information;
- have a knowledge and practical understanding of engineering management;
- can acquire oral, written and IT communication skills and interpersonal skills to develop a positive aptitude for independent thinking and action;

An underpinning aim of the programme is to enable graduates with a variety of educational backgrounds to benefit from the programme, irrespectively of race, background, gender or physical disability both from within the UK and overseas.

WHAT WILL I BE EXPECTED TO ACHIEVE?

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

Knowledge and understanding:

- apply a strong foundation in Mathematics and Physics relevant to Electrical and Electronic Engineering;
- apply the fundamental concepts principles and theories that are relevant to Electrical and Electronic Engineering as a discipline;
- outline an understanding of the general principles of design and design techniques in engineering systems, especially those specific to Electrical and Electronic Engineering;
- apply detailed knowledge and understanding of the essential facts, concepts, principles and theories in the fields of: electronic circuit design, engineering science, control engineering, signal processing, telecommunication systems and related fields
- apply the principles of Information Technologies and Communications (ITC) underpinning Electrical and Electronic Engineering ;
- outline the role of the engineer in society and the business and management techniques that are relevant to Electrical and Electronic engineers.

Skills:

- analyse and solve problems in Electrical and Electronic Engineering,
- formulate and test hypotheses relevant to Electrical and Electronic Engineering;
- design 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;
- 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 critical evaluate experimental results. Prepare technical reports and give technical presentations using a variety of information sources and constructed using appropriate computer tools and packages;
- work effectively with IT tools - to program and to use computational packages for modelling, design and simulation;
- communicate effectively both verbally and in writing;
- work effectively as part of a team;
- achieve familiarity with methods of mathematical modelling and analysis at an appropriate level;
- correctly reference the work of other people;
- learn to adapt to new or unfamiliar situations and technologies.

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;
- 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 enable you to acquire and develop generic and subject-specific knowledge and understanding, thinking, practical and transferable skills. This is assured by a diverse and carefully planned teaching and learning styles based upon lectures, tutorials, practical work and design projects. The programme structure is designed to accommodate the diverse backgrounds of students and is delivered in a modular format.

Taught modules, which may be single or double, are designed to provide the bulk of the formal teaching of mathematical and subject-specific engineering subjects. Single modules are run for one term and double modules over two terms. Single taught modules normally comprise minimum of 20 hours of lectures, 10 hours of problem solving, example and revision classes, a minimum of 15 hours of laboratory classes, and on average at least 60 hours of independent study. The laboratory work runs in parallel with the lectures and tutorials. This work provides you with engineering skills appropriate for electrical and electronic engineers. In laboratories, your work will be supervised by academic staff with support from research students and technicians.

The first two years of this Programme provide you with a broad knowledge base of Electrical and Electronic Engineering and its use in interdisciplinary engineering projects. Engineering mathematics, circuit design, electronics, and computer programming are covered, as well as basics of control engineering, telecommunication systems, and numerical computing. In addition to this, Electrical and Electronic Engineering students require management and presentation skills, and an awareness of the economic, environmental, and social implications of their activity. These issues are comprehensively covered in our Engineering practice and Engineering management classes. Each one of you will have a personal tutor, who guides you throughout your studies and helps you to develop and follow a professionally designed Personal Development Plan.

All modules have a theoretical, demonstrative and practical (design and development) part. Detailed laboratory exercises are in place which will enable you to understand further the underlying theory of a particular subject.

The final year provides a more specialised insight into advanced topics in Electrical and Electronic Engineering. You will be required to solve advanced design issues in the laboratory work. Advanced modelling and design techniques are covered, as well as practical software development tools and techniques.

The final year includes a significant Final Year Project, which expects you to work independently (with academic advice and supervision) to solve an advanced engineering design problem, develop a prototype or simulation and present the work in the form of detailed project thesis and presentation. Engagement in the Final Year Project allows you to interact with members of the School's various research teams, working alongside researchers on highly relevant and exciting projects.

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.

The Programme consists of three 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. Majority of the modules has at least two independent assessments (typically a written examination and a coursework). Pass mark for all assessment is 40%.

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 their 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 your ability to complete the Programme.

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. At the end of each examination period the Assessment Board is organised to make final decisions on your progress. The School will formally inform you about all the module marks and about your progression, typically within 5-6 weeks after the last examination. The full feedback 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 the relevant modules and assessments and will therefore acquire the required number of credits. 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%. To pass a module, you need to obtain at least 40% mark in all the components of the module. 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)
- 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.

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 calculation.

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?

Bachelor's Degree with Honours:

Programme Stage	HE Level	Credits	Weighting (%)	Class	% required
1	4	120	0	I	70
2	5	120	33	II upper division	60

3	6	120	67	II lower division	50
				III	40
<u>Ordinary Degree:</u>					
Programme Stage	HE Level	Credits	Weighting (%)	Class	% required
1	4	120	0	With Distinction	70
2	5	120	33	With Merit	60
3	6	60	67	With Pass	40
<u>Diploma of Higher Education:</u>					
Programme Stage	HE Level	Credits	Weighting (%)	Class	% required
1	4	120	33	With Distinction	70
2	5	120	67	With Merit	60
				Without Classification	40
<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 Classification	40

WHAT WILL I STUDY?

Foundation Year 0

The foundation year consists of one compulsory module worth 120 credits. To proceed to Programme Stage 1 you must have achieved the appropriate level in the foundation year which is an overall mark of 65% (including 65% in each topic of the module).

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
Foundation year module	EE0001	120	C	N	3

Programme Stage 1

Programme Stage 1 consists of 7 compulsory modules, totalling 120 credits. To pass

Programme Stage 1, you must have acquired 120 credits.

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, you must have acquired 120 credits. Those of you who undertake the optional placement year will register for the Professional Placement module (ET2014) after completing Programme Stage 2.

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	
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
------------------------	--------

Programme Stage 3

Programme Stage 3 consists of 7 compulsory modules totalling 120 credits. To pass Programme Stage 3, you must have acquired 120 credits.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compensated?	Level
--------------	-----------	----------------	----------------	---------------------	-------

Individual Project, BEng 3	EE3400	30	C	N	6
Embedded and Realtime Systems	EE3422	15	C	Y	6
Engineering Systems	EE3500	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
Engineering Management 3	ET3051	15	C	Y	6

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.

In addition to this, our graduates are well received at major Universities in the United Kingdom and overseas, where they pursue advanced Masters and 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. You will receive excellent support for industrial placement and careers throughout your studies and after you 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?

Industrial placements are offered to you after the second year of study. The School provides links between yourself and the companies, helps you prepare for interviews and encourages you to take industrial placements. You are informed about industrial placement in the Placement Brochure which is made available to you and also through a series of lectures facilitated by the Industrial Tutor and the University Career Service. You will not get any academic credit for doing the Industrial Placement.

WILL I GET ANY PROFESSIONAL RECOGNITION?

Accrediting Body: The Institution of Engineering and Technology

Nature of Accreditation

Accreditation of the BEng leads to partial fulfilment of the academic requirements for registration as a Chartered Engineer (CEng).

Accrediting Body: Institute of Measurement and Control

Nature of Accreditation

Accreditation of the BEng leads to partial fulfilment of the academic requirements for registration as a Chartered Engineer (CEng).

HOW DO I ENTER THE PROGRAMME?

Typical offers require one of the following:

A/AS-level: 200 UCAS tariff points, A-level mathematics and a science or electronic required with a minimum of grade D in A-level mathematics. Point scores exclude general studies and key skills.

BTEC: MMM in Electrical and/or Electronic Engineering, including M in both mathematics modules.

IB: 22, including High Level mathematics and Standard Level science, or Standard Level mathematics and High Level science.

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.

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 City's website at <http://www.city.ac.uk/study/why-study-at-city/fees-and-finance/scholarships>.

Version: 5.0

Version date: July 2016

For use from: 2016-17