PROGRAMME SPECIFICATION – UNDERGRADUATE PROGRAMMES

KEY FACTS

Programme name	BEng Computer Systems Engineering / BEng Computer Systems Engineering with Placement
Award	BEng (Hons)
School	School of Mathematics Computer Science and Engineering
Department or equivalent	Department of Electrical and Electronic Engineering
UCAS Code	H600/H601
Programme code	USCSYB
Type of study	Full Time
Total UK credits	360
Total ECTS	180

PROGRAMME SUMMARY

The BEng in Computer Systems Engineering is a three year Bachelor Undergraduate Programme. The main aim of the programme is to equip you with practical skills and knowledge which enable you to play leading roles in a rapidly developing world of smart devices design, embedded systems design, IT and systems engineering. As a graduate of this programme you will have specialised knowledge in computer systems, electronics design, computer programming, embedded and real-time systems, engineering mathematics and engineering management.

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 Part 1 and Part 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 Part 2.

Certificate / Part One
For all of you completing Part one *or* the Certificate in Computer Systems 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 / Part Two
For all of you completing Part Two *or* the Diploma in Computer Systems 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 / Part Three
For all of you completing Part 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 computer systems and networks, embedded real-time systems, Java programming and software engineering 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:

- have a sound theoretical and practical education in computer systems and relevant subjects , who will qualify for appropriate exemptions to membership of professional institutions by providing modules of appropriate standard;
- are able to undertake and complete a major piece of independent work on a given topic in IT and computing;
- are able to meet the needs of industry and commerce by providing distinctive courses which reflect the demand for qualified graduates and by teaching engineering design concepts relevant to computer systems;
- have the ability to reflect relevant specialisations in IT, computer systems and communications based on the teaching and research strengths of the field;
- can develop the ability to adapt to new technology in the IT and computing field 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 the discrete mathematics relevant to Computer Systems Engineering;
- apply the fundamental concepts principles and theories that are relevant to Computer Systems Engineering as a discipline;
- apply detailed knowledge and understanding of the essential facts, concepts, principles and theories of computer systems design, computer programming, electronic circuit design, computer architecture, control engineering and communication systems;
- outline an understanding of the general principles of design and design techniques in engineering systems, especially those specific to Computer Systems Engineering;
- apply the principles of IT and Communications (ITC) underpinning Computer Systems Engineering;
- outline the role of the engineer in society and the business and management techniques that are relevant to computer systems engineers.

Skills:
- analyse and solve problems in computer systems engineering;
- design systems and processes using sound principles of computer systems, communications and IT engineering;
- 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;
- formulate and test hypotheses relevant to computer systems engineering and IT;
- evaluate IT tools critically;
- work effectively with IT tools to produce and test working software systems;
- prepare technical reports and give technical presentations using a variety of information sources and constructed using appropriate computer tools and packages;
- work safely in a laboratory environment, use test equipment, set up experiments and take accurate measurements, record progress of an experiment in a lab book and summarise results in technical reports;
- communicate effectively both verbally and in writing;
- make effective use of information technology and related tools;
- work effectively as part of a team;
- achieve familiarity with methods of mathematical modelling and analysis at an appropriate level;
- 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;
- correctly reference the work of other people;
- show consideration for the rules and regulations of the University.

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.

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 20 hours of lectures, 10 hours of problem solving, example and revision classes, and 15 hours of coursework and laboratory classes. The laboratory work runs in parallel with the taught modules. This work provides you with engineering skills appropriate for computer systems 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 computer systems and their use in interdisciplinary engineering projects. Engineering mathematics, circuit design, electronics, and computer programming are covered, as well as the basics of control engineering, telecommunication systems, and numerical computing. In addition to this, computer system 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.

The final year provides a more specialised insight into advanced topics in computer system 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 Individual project combines the skills and knowledge obtained in the Programme. You will be encouraged to present the design process and perform comprehensive testing of the developed applications and analyse in detail the existing technological solutions.

The programme is taught in formal lectures, seminars and tutorials, supplemented by experimental laboratories. Assessment is based on marks obtained throughout each year for coursework, viva on the various aspects of the programme, and on the results of the mid-year and end-of-year examinations.

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 parts. Each part is delivered in one full academic year and totals 120 academic credit points. Each Part 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%, apart from EPM759 which has pass mark of 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 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 or be exempted from the relevant modules and assessments and will therefore acquire the required number of credits. You also need to pass each Part of your Programme in order to progress to the following Part.

The Pass mark for each module is 40% (apart from EPM759, where the pass mark is 50%). To pass a module, you need to obtain at least 40% mark in all the components of the module (apart from EPM759, where the pass mark is 50%). 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 20 credits of a Part at first or resit attempt, you may be allowed compensation if:
    *   Compensation is permitted for the module involved (see the module specification), and
    *   It can be demonstrated that you have satisfied all the Learning Outcomes of the modules in the Part, and
    *   A minimum overall mark of no more than 10 percentage points 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 Part.

If you receive a compensated pass in a module you shall be awarded the credit for that module. The original component marks shall be retained in the record of marks and the greater of the original module mark and the minimum pass mark for the module shall be used for the purpose of calculation towards the Award.

2. Resit: you will normally be offered one resit attempt. However, if you did not participate in the first assessment and have no extenuating circumstances, you may not be offered a resit.

If you are successful in the resit, you shall be awarded the credit for that module. The mark used for the purpose of calculation towards your Award shall be calculated from the original marks for the component(s) that you passed at first attempt and the minimum pass mark for the component(s) for which you took a resit.

If you do not satisfy your resit by the date specified you will not progress to the next Part and the Assessment Board shall require that you withdraw from the Programme.

If you fail to meet the requirements for a particular Part, but satisfy the requirements for the previous Part, then a lower qualification may be awarded as per the table below. If you fail to meet the requirements for a particular Part and are not eligible for the award of a lower level qualification, the Assessment Board shall require that you withdraw from the Programme.

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:

Part	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:

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

Class	% required
With Distinction	70
With Merit	60
With Pass	40

Diploma of Higher Education:

Part	HE Level	Credits	Weighting (%)
1	4	120	33
2	5	120	67

Class	% required
With Distinction	70
With Merit	60
With Pass	40

Certificate of Higher Education:

Part	HE Level	Credits	Weighting (%)
1	4	120	100

Class	% required
With Distinction	70
With Merit	60
With Pass	40

WHAT WILL I STUDY?

Part 1

Part 1 consists of 7 compulsory modules, totalling 120 credit points. To pass Part 1, you must have acquired 120 credits.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compen-sated?	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

Part 2

Part 2 consists of 7 compulsory modules, totalling 120 credit points. To pass Part 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 Part 2.

Module Title	SITS Code	Module Credits	Core/ Elective	Can be compen-sated?	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	EE2506	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

Part 3

Part 3 consists of 5 compulsory modules (7 at HE3 level) and 1 elective module, totalling 120 credits. To pass Part 3, you must have acquired 120 credits. You have to choose one the two elective modules. Control Systems Design is a required module by the Institute of Measurement and Control.

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

Individual Project, BEng 3	EE3400	30	C	N	6
Embedded and Realtime Systems	EE3422	15	C	Y	6
Digital Communications	EE3447	15	E	Y	6
Control Systems Design	EPM759	15	E	Y	7
Computer Systems and Networks	EE3505	30	C	N	6
Java Programming	EE3506	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 computing, 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 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?

The University provides you with an option to spend one term studying abroad. You will have an opportunity to study in a number of prestigious Universities in Europe and elsewhere in the world.

The University provides clear guidelines for application for study abroad, which are available on University web sites. A number of scholarships are available for you. Full information is available on:
http://www.city.ac.uk/international/international-students/exchange-programmes

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WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?

Industrial placements are offered to you after the second year of study. The School provides links between you and the companies and 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?

The programme was awarded accreditation by the Institute of Engineering and Technology (IET) and the Institute of Measurement and Control (InstMC) as partially meeting the Engineering Council UK educational requirements for Chartered Engineer.

The current accreditation of the programme has come to an end at the end of the academic year 2014/15 and a new full accreditation visit is taking place during the academic year 2015/16. If the programme is successfully accredited during 2015/16 it will be backdated.

HOW DO I ENTER THE PROGRAMME?

Typical offers require one of the following:

A/AS-level: 300 UCAS tariff points, including 'A' Level Mathematics at grade B or higher and at least one 'A' level in a science subject, preferably Physics or Electronics.

BTEC: DDD in a relevant subject, including D in L3 mathematics.

IB: 32, including 5 in High Level mathematics and physics.

14-19 Advanced Diploma: Engineering at grade B/250; A-level mathematics at grade B/100.

APEL:
Direct entry into Part 2: direct entry into Part 2 is possible following successful completion of Part 1 of a comparable accredited BEng (Honours) programme. Suitable HNC and HND equivalents (e.g., equivalent overseas qualifications) are also considered. However, in all cases the final decision is subject to the satisfactory evaluation of prior qualifications by 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 H608 with City University are permitted to enter Part 1 of the programme.

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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