PROGRAMME SPECIFICATION – UNDERGRADUATE PROGRAMMES

KEY FACTS

<table>
<thead>
<tr>
<th>Programme name</th>
<th>BEng Telecommunications / BEng Telecommunications with Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award</td>
<td>BEng (Hons)</td>
</tr>
<tr>
<td>School</td>
<td>School of Mathematics, Computer Science and Engineering</td>
</tr>
<tr>
<td>Department or equivalent</td>
<td>Department of Electrical and Electronic Engineering</td>
</tr>
<tr>
<td>UCAS Code</td>
<td>H645/H646</td>
</tr>
<tr>
<td>Programme code</td>
<td>USTCMB</td>
</tr>
<tr>
<td>Type of study</td>
<td>Full Time</td>
</tr>
<tr>
<td>Total UK credits</td>
<td>360</td>
</tr>
<tr>
<td>Total ECTS</td>
<td>180</td>
</tr>
<tr>
<td>Partner (partnership programmes only)</td>
<td></td>
</tr>
<tr>
<td>Type of partnership</td>
<td></td>
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</tbody>
</table>

PROGRAMME SUMMARY

The BEng in Telecommunications is a three year Bachelor Undergraduate Programme. The programme provides you with practical skills and knowledge which enables you to play a leading role in the growing telecommunications industry. The programme includes a comprehensive study of electronic circuit design, engineering mathematics, engineering management and a number of areas in telecommunications: digital, optical and wireless communications.

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 Telecommunications 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 Telecommunications 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 digital broadcasting technology, digital communications, optical and wireless communications and signal processing 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 telecommunications industry, the professions and public service;
- have a sound theoretical and practical education in electronics and communication systems, 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 in communications devices and systems on a given topic;
- 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;
- have the ability to reflect specialisations in communications based on the teaching and research strengths of the School in optoelectronics and photonics and wireless and mobile systems;
- can develop the ability to adapt to new technology relevant to communications systems and IT 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;
- can provide support and practical guidance in team working and delivering business presentations;

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 the fundamental concepts, principles and theories relevant to Communications systems;
- apply detailed knowledge and understanding of the essential facts, concepts, principles and theories of communications devices and systems, design, signals, optoelectronics and photonics engineering and wireless and mobile communication systems;
- analyse and solve problems in electronics, systems and Communications;
- model and/or design systems, sub-systems or processes using sound principles of electronics, optoelectronics and communications engineering;
- use scientific principles in the development of solutions to practical problems in the electronic communications field;
- select and apply appropriate computer based methods for modelling and analysis of engineering problems relevant to the communications industry;
- plan and perform safely experimental work in an electronics communications laboratory environment;
- analyse and critically evaluate experimental results;
- work effectively with IT tools such as finite element modelling packages to program devices and to use commercial computational packages for modelling, design and simulation in the communications field;
- understand the concepts of engineering design, as applied to communications systems;
- apply relevant mathematical skills showing familiarity with methods of mathematical modelling and analysis;
- apply basic mathematics and physics that are relevant to communications engineering and systems and engineering in general;
- develop an understanding of the general principles of design and design techniques specific to Communications systems;
- understand the role of the engineer in society and the business and management techniques which are relevant to engineering and Communications engineers.

Skills:
- analyse and solve problems in electronics, systems and Communications;
- communicate effectively both verbally and in writing;
- plan and perform safely experimental work in an electronics communications laboratory environment;
- model and/or design systems, sub-systems or processes using sound principles of electronics, optoelectronics and communications engineering;
- make effective use of IT and Communications (ITC) technology in the field;
- use test and measurement equipment, take accurate measurements and record progress of an experiment in the field in a laboratory book;
• analyse and critical evaluate experimental results;
• work effectively as part of a team;
• use scientific principles in the development of solutions to practical problems in the electronic communications field;
• apply relevant mathematical skills showing, familiarity with methods of mathematical modelling and analysis;
• exercise critical evaluation of information accessed from a wide variety of sources (the Internet, scientific databases, technical reports and data sheets);
• exercise professional judgement and take account of non-technical issues such as economics and benefit to society;
• learn to adapt to new or unfamiliar situations and technologies;
• select and apply appropriate computer based methods for modelling and analysis of engineering problems relevant to the communications industry;
• prepare technical reports and give technical presentations using a variety of information sources and constructed using appropriate computer tools and packages.
• manage time and resources;
• manipulate and sort data and present the data in a variety of ways;
• formulate and test hypotheses;
• use scientific literature effectively;
• use the engineering approach to the solution of problems relevant to the communications field;
• research for information to develop idea further;
• develop generic analytical and numerical abilities.

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. 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, you 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 their 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, Telecommunications 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 Telecommunications. 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 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%.

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.

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:

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 Parts are weighted to calculate the final degree classification – the weights are presented elsewhere in this specification.

The Pass mark for each module is 40% (apart from EEMXXX, 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 EEMXXX 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:

<table>
<thead>
<tr>
<th>Part</th>
<th>HE Level</th>
<th>Credits</th>
<th>Weighting (%)</th>
<th>Class</th>
<th>% required</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>120</td>
<td>0</td>
<td>I</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>120</td>
<td>33</td>
<td>II upper division</td>
<td>60</td>
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<tr>
<td>3</td>
<td>6</td>
<td>120</td>
<td>67</td>
<td>II lower division</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>40</td>
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Ordinary Degree:

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<tr>
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<th>Credits</th>
<th>Weighting (%)</th>
<th>Class</th>
<th>% required</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>120</td>
<td>0</td>
<td>With Distinction</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>120</td>
<td>33</td>
<td>With Merit</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>60</td>
<td>67</td>
<td>With Pass</td>
<td>40</td>
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Diploma of Higher Education:

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<tr>
<th>Part</th>
<th>HE Level</th>
<th>Credits</th>
<th>Weighting (%)</th>
<th>Class</th>
<th>% required</th>
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<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>120</td>
<td>33</td>
<td>With Distinction</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>120</td>
<td>67</td>
<td>With Merit</td>
<td>60</td>
</tr>
<tr>
<td></td>
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<td>With Pass</td>
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Certificate of Higher Education:

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<thead>
<tr>
<th>Part</th>
<th>HE Level</th>
<th>Credits</th>
<th>Weighting (%)</th>
<th>Class</th>
<th>% required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>120</td>
<td>100</td>
<td>With Distinction</td>
<td>70</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>With Merit</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>With Pass</td>
<td>40</td>
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</table>

WHAT WILL I STUDY?

Part 1

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

<table>
<thead>
<tr>
<th>Module Title</th>
<th>SITS Code</th>
<th>Module Credits</th>
<th>Core/Elective</th>
<th>Can be compensated?</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Science</td>
<td>EE1427</td>
<td>15</td>
<td>C</td>
<td>Y</td>
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</tr>
<tr>
<td>Engineering Practice</td>
<td>EE1500</td>
<td>10</td>
<td>C</td>
<td>Y</td>
<td>4</td>
</tr>
<tr>
<td>Digital Logic</td>
<td>EE1501</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>4</td>
</tr>
<tr>
<td>Electronic Circuit Design 1</td>
<td>EE1502</td>
<td>30</td>
<td>C</td>
<td>N</td>
<td>4</td>
</tr>
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</table>
Part 2

To pass Part 2, you must have acquired 120 credits as specified in Part 2 of the Programme Specification. Part 2 consists of 7 compulsory modules totalling 120 credit points. Those of you who undertake the optional placement year will register for the Professional Placement module (ET2014) after completing Part 2.

<table>
<thead>
<tr>
<th>Module Title</th>
<th>SITS Code</th>
<th>Module Credits</th>
<th>Core/ Elective</th>
<th>Can be compensated?</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamics and Control</td>
<td>EE2401</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>5</td>
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<tr>
<td>Communication Systems</td>
<td>EE2402</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>5</td>
</tr>
<tr>
<td>Object-Oriented Programming</td>
<td>EE2425</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>5</td>
</tr>
<tr>
<td>Analogue Electronics</td>
<td>EE2514</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>5</td>
</tr>
<tr>
<td>Digital Electronics</td>
<td>EE2507</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>5</td>
</tr>
<tr>
<td>Numerical Computing and Statistics</td>
<td>EE2512</td>
<td>10</td>
<td>C</td>
<td>Y</td>
<td>5</td>
</tr>
<tr>
<td>Engineering Management 2</td>
<td>ET2052</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>5</td>
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<tr>
<td>Engineering Mathematics 2</td>
<td>EX2003</td>
<td>20</td>
<td>C</td>
<td>N</td>
<td>5</td>
</tr>
</tbody>
</table>

Professional Placement                      | ET2014    |                |                |                      |       |

Part 3

To pass Part 3, you must have acquired 120 credits as specified in Part 3 of the Programme Specification and have successfully completed the professional placement, if applicable. Part 3, totalling 120 credits consists of 7 core modules including a substantial final-year project carrying 30 credits.

<table>
<thead>
<tr>
<th>Module Title</th>
<th>SITS Code</th>
<th>Module Credits</th>
<th>Core/ Elective</th>
<th>Can be compensated?</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Project, BEng 3</td>
<td>EE3400</td>
<td>30</td>
<td>C</td>
<td>N</td>
<td>6</td>
</tr>
<tr>
<td>Computer Networks</td>
<td>EE3440</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>6</td>
</tr>
<tr>
<td>Digital Communications</td>
<td>EE3447</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>6</td>
</tr>
<tr>
<td>Electric and Magnetic Fields</td>
<td>EE3520</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>6</td>
</tr>
<tr>
<td>Signal Processing</td>
<td>EE3502</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>6</td>
</tr>
<tr>
<td>Telecommunication Systems</td>
<td>EEM508</td>
<td>15</td>
<td>15</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>Engineering Management 3</td>
<td>ET3051</td>
<td>15</td>
<td>C</td>
<td>Y</td>
<td>6</td>
</tr>
</tbody>
</table>
**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 telecommunications, digital media, energy 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](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](http://www.city.ac.uk/international/international-students/exchange-programmes).

**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 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 H606 with City University are permitted to enter Part 1 of the programme.

Scholarships
A range of Scholarship is 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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