PROGRAMME SPECIFICATION – POSTGRADUATE PROGRAMMES

KEY FACTS

<table>
<thead>
<tr>
<th>Programme name</th>
<th>Internet of Things with Entrepreneurship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award</td>
<td>MSc</td>
</tr>
<tr>
<td>School</td>
<td>Mathematics, Computer Science and Engineering</td>
</tr>
<tr>
<td>Department or equivalent</td>
<td>Electrical and Electronic Engineering</td>
</tr>
<tr>
<td>Programme code</td>
<td>PSITHE</td>
</tr>
<tr>
<td>Type of study</td>
<td>Full time/Part time</td>
</tr>
<tr>
<td>Total UK credits</td>
<td>180</td>
</tr>
<tr>
<td>Total ECTS</td>
<td>90</td>
</tr>
<tr>
<td>Partner (partnership programmes only)</td>
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<tr>
<td>Type of partnership</td>
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PROGRAMME SUMMARY

The MSc in Internet of Things with Entrepreneurship is designed to provide knowledge and understanding of the current technologies used in the growing IoT industry with a core focus on a design project inspired by an industry advisor or aimed for a new venture. The programme is suitable for new graduates and professionals who want to advance their understanding of the field. Students will gain a deep knowledge of IoT by designing real “things” comprising the IoT. The programme is unique in its central focus on design, close involvement with the IoT industry, and entrepreneurship training delivered by the university’s highly ranked Cass Business School.

In support of the design project, the programme offers taught modules on modern technologies related to IoT including:
- IoT technologies (sensors, devices, systems, electronics, software)
- IoT security
- Communications and networks
- Data analytics
And a two-term Entrepreneurship module from the Cass Business School covering new venture creation, new product development, and marketing.

The MSc programme totals 180 credits, which consist of 6 taught modules totalling 120 credits, and a 60 credit project/dissertation.

The programme is offered full time and part time.
The full-time route follows a normal 12-month pattern with two terms of taught modules followed by a 4-month individual design project/dissertation.
The part time route follows a 24-28 months pattern with 60 credits taught in year 1, then 60 credits taught in year 2, followed by an individual design project/dissertation.

The programme is guided by an active industry advisory board which will provide project ideas, advice and feedback on projects, and competitive three to six month
placements (at their discretion).

**MSc in IoT with Entrepreneurship**
The MSc in IoT with Entrepreneurship is achieved by gaining 180 credits, i.e. by completing all taught modules and successfully defending the dissertation. Through the group and individual design projects, you will be engaged in engineering design or research that contributes the creation of new “things” for the IoT keeping in mind how it fulfils a business or market need. At the end of the MSc, you will have acquired a deep knowledge of the IoT that will prepare you for a successful industry career.

**PG Diploma in IoT with Entrepreneurship**
Completion of the taught modules, totalling 120 credits, awards a PG Diploma in IoT with Entrepreneurship. On completion of this Diploma, you will have acquired a theoretical knowledge on various aspects of IoT with an emphasis on IoT technologies, communication networks, entrepreneurship, business models, data analytics, and security. You will also have demonstrated practical skills through laboratory based work that will prepare you for starting a career in the IoT field.

**PG Certificate in IoT with Entrepreneurship**
Achieving at least 60 credits in taught modules awards a PG Certificate in IoT with Entrepreneurship. Through this certificate, you will have gained theoretical knowledge in some aspects of IoT, which depends on the modules that have been passed.

**Aims**
The programme aims to:
- Provide you with postgraduate education and training in the field of Internet of Things.
- Provide you with knowledge and skills for designing and creating “things” (smart objects for IoT).
- Provide you with postgraduate level understanding of entrepreneurship and business models.
- Satisfy the needs of industry and the professional institutions for graduates with a greater in-depth knowledge in these fields.
- Achieve educational parity with European engineering graduates, where undergraduate courses are usually at least 4 years.

**WHAT WILL I BE EXPECTED TO ACHIEVE?**

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

**Knowledge and understanding:**
- Synthesise and apply knowledge of the general areas of Internet of Things.
- Propose and formulate advanced techniques and methods applicable to a given
IoT problem.
- Apply and critically evaluate advanced software techniques to deal with analysis and design tasks in the general area of IoT.

Skills:
- Be conversant in fundamental technologies related to IoT.
- Apply analytic and design knowledge gained in module study to IoT problems in given problems and laboratory exercises in creative and innovative ways.
- Develop and assess concepts and hypothesis in the laboratory.
- Analysis and design innovative techniques, in appropriate module areas, to develop concepts and evaluate them through suitable hardware and/or software platforms.
- Communicate the results of analysis and design in extended scientific reports and oral presentations.
- Develop and apply Research Skills and Techniques to further develop knowledge in the field.
- Solve complex engineering problems using advanced scientific software packages
- Application of software or problem solving techniques, analysis and design.
- Create strategies to design and develop new products to meet a market need.

Values and attitudes:
- Examine the importance of working with others in promoting an effective and innovative learning environment.
- Respect and listen other views.
- Develop and apply techniques to support the appropriate and ethical use of the Internet.

This programme has been developed in accordance with the QAA Subject Benchmark for generic maters level programmes.

HOW WILL I LEARN?

The teaching and learning strategy is based on lectures, tutorials, laboratory coursework, and seminars. Lectures will provide a solid theoretical understanding of relevant technical and business fields. Seminars will focus on specialised topics related to IoT. Tutorials and labs will give you opportunities for practical training and experience in problem solving and experiments. In each module, you will be expected to spend a large number of hours for self-directed learning on background reading, revision of notes, work on tutorial problems, and preparation for labs.

The programme focuses on a group and individual design project given by the industry advisory board or based on your own idea.

A project fair at the beginning of the programme may be organised to disseminate project ideas and allow you to network with each other and industry advisors.
You are encouraged to apply to attend a Starter Weekend offered by Cass Business School that will acquaint you with business plans and inspire new ventures. Cass may select attendees at their discretion.

At the end of the programme, selected individual projects will compete as new ventures, which will be judged but not marked.

Various technical and business seminars will be held throughout the programme, approximately monthly. These seminars will reinforce knowledge in support of the group and individual design projects.

The research project/dissertation aims to provide you with the opportunity to deal with problems in areas where new subject knowledge is required. This involves literature search, assessment of the relevance of previous work, the development of the research task, self-directed research, and the presentation of research results.

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessment and Assessment Criteria

Assessment of the programme modules comprises written examinations and laboratory coursework. Each individual module coursework is combined with the written module examination to provide an overall module mark.

The Group Design Project will be assessed through an interim group report and a final group report, viva, and poster session.

The Individual Project is assessed primarily through a dissertation but with contributions from an interim report, work carried out during the project period and oral examination.

Assessment Criteria are descriptions, based on the intended learning outcomes, of the skills, knowledge or attitudes that you need to demonstrate in order to complete an assessment successfully, providing a mechanism by which the quality of an assessment can be measured. Grade-Related Criteria are descriptions of the level of skills, knowledge or attributes that you need to demonstrate in order achieve a certain grade or mark in an assessment, providing a mechanism by which the quality of an assessment can be measured and placed within the overall set of marks. Assessment Criteria and Grade-Related 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

Feedback will be provided in line with our Assessment and Feedback Policy. In particular, 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 the relevant modules and assessments and will therefore acquire the required number of credits. You also need to pass each stage of your Programme in order to progress to the following stage.

The Pass mark for each module is 50% for both Coursework and Examination combined. The Pass mark for the group design project is 50%. The Pass mark for the dissertation (individual project) is 50%.

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 at first or resit attempt (15 for a Postgraduate Certificate), 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, 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 50% has been achieved overall.

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 shall be used for the purpose of your 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 the requirements for a module and do not complete your resit by the date specified you will not progress and the Assessment Board will require that you be withdrawn from the Programme.

If you fail to meet the requirements for 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’s Degree:**

<table>
<thead>
<tr>
<th>HE Level</th>
<th>Credits</th>
<th>Weighting (%)</th>
<th>Class</th>
<th>% required</th>
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<tbody>
<tr>
<td>Taught</td>
<td>7</td>
<td>120</td>
<td>With Distinction</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>With Merit</td>
<td>60</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>With Pass</td>
<td>50</td>
</tr>
<tr>
<td>Dissertation</td>
<td>7</td>
<td>60</td>
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**Postgraduate Diploma:**

<table>
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<th>HE Level</th>
<th>Credits</th>
<th>Weighting (%)</th>
<th>Class</th>
<th>% required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taught</td>
<td>7</td>
<td>120</td>
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<tr>
<td></td>
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<td></td>
<td>With Merit</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>With Pass</td>
<td>50</td>
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**Postgraduate Certificate:**

<table>
<thead>
<tr>
<th>HE Level</th>
<th>Credits</th>
<th>Weighting (%)</th>
<th>Class</th>
<th>% required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taught</td>
<td>7</td>
<td>60</td>
<td>With Distinction</td>
<td>70</td>
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<tr>
<td></td>
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<td></td>
<td>With Merit</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>With Pass</td>
<td>50</td>
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### WHAT WILL I STUDY?

**Taught component**

The programme consists of 6 taught modules: 4 core modules and a choice between 2 elective modules. Three modules (IoT Technologies, Entrepreneurship and Group Design Project) will span two terms.

<table>
<thead>
<tr>
<th>Module Title</th>
<th>SITS Code</th>
<th>Module Credits</th>
<th>Core/Elective</th>
<th>Compensation Yes/No</th>
<th>Level</th>
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<tbody>
<tr>
<td>IoT Technologies</td>
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<td>Core</td>
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<td>7</td>
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<tr>
<td>IoT Security</td>
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<td>Core</td>
<td>Y</td>
<td>7</td>
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<tr>
<td>Entrepreneurship</td>
<td>EPM513</td>
<td>30</td>
<td>Core</td>
<td>Y</td>
<td>7</td>
</tr>
</tbody>
</table>
You are required to complete all the taught modules successfully before progressing to the dissertation.

**TO WHAT KIND OF CAREER MIGHT I GO ON?**

Information and Communication Technology (ICT) is the major technology influencing all aspects of our life, health, entertainments and society. Electronic communications, including the Internet covering fundamental technologies, electronics, informatics, wireless communications, optical communications, mobile communications, satellite communications, communication protocols, networks, encryption, e-commerce, and digital security are fundamental disciplines spread in both established and emerging technological areas. Career opportunities for a graduate in IoT can be found in all these fields. There are also opportunities for further studies by research leading to PhD after the MSc studies.

Three employability routes have been identified:
- Graduates create their own start-up after using the group design project as a pre-incubator;
- Graduates can work for one of the many start-ups in the UK. As, through the proposed programme, they will have acquired the latest technical knowledge and will understand the specifics of working for the start-up, graduates will be more attractive for such employers and will contribute better and faster to the growth of the companies;
- Finally, graduates will be also attractive to large companies either developing IoT technologies and/or services or providing consultancy to start-ups.

More information on career paths and Career support at City, please go to: [http://www.city.ac.uk/careers](http://www.city.ac.uk/careers)

**WHAT STUDY ABROAD OPTIONS ARE AVAILABLE?**

Study Abroad is not offered in this Programme.

**WHAT PLACEMENT OPPORTUNITIES ARE AVAILABLE?**

- Competitive three to six month placements will be offered by companies in the industrial advisory board, at their discretion.
- The School Professional Liaison Unit provides support to prepare CVs, interviews and application for internships.
If a placement is successfully arranged, it is linked to the student’s dissertation and may take place between July to December, followed up by dissertation writing.

**HOW DO I ENTER THE PROGRAMME?**

To Register for the MSc a minimum admission requirement is a Second Class Hons degree, or equivalent in an Engineering, Scientific or Mathematical discipline will be required.

Suitable industrial experience will also be considered, such as a few years in related industry or start-ups.

For those overseas applicants, whose first language is not English or their country has not been exempted from the English language requirement by the UK Home Office, they will need to provide one of the following English test qualifications:

- IELTS: 6.5 (minimum of 6.0 in all four test components is preferable)
- TOEFL 92 (minimum of 20 in Listening, Reading and Speaking, and 22 in Writing)