

Programme Title: MSc in the Internet of Things (Data) with Industrial Experience



Programme Specification

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| Awarding Body/Institution | Queen Mary University of London |
| Teaching Institution | Queen Mary University of London |
| Name of Final Award and Programme Title | Master of Science (MSc) in the Internet of Things (Data) with Industrial Experience |
| Name of Interim Award(s) | PG Certificate and PG Diploma |
| Duration of Study / Period of Registration | 24 Months FT |
| QM Programme Code / UCAS Code(s) | I1T1 |
| QAA Benchmark Group | Computing |
| FHEQ Level of Award | Level 7 |
| Programme Accredited by | N/A |
| Date Programme Specification Approved | |
| Responsible School / Institute | School of Electronic Engineering & Computer Science |

Schools which will also be involved in teaching part of the programme

N/A

Institution(s) other than Queen Mary that will provide some teaching for the programme

N/A

Programme Outline

IoT focuses on a vision of more connected, different, things (or digital devices) than in previous visions of Internet. More things are part of the physical world that connect to form smart environments. Humans will use more different things (sensors, tags, cards, phones, actuator, wearables) to interact with the world. Machine to machine interaction will allow more physical things to interact with other things without human intervention.

There are several important indicators that there is a need for skilled graduates with IoT skills: the increasing number of heterogeneous connected things, the perceived increase in market revenue, the increasing range of IoT products from startups, the range of major established high-tech companies with IoT divisions, the interest in developing IoT standards, and specific IoT jobs are increasingly being advertised.

QMUL School of Electronic Engineering and Computer Science is well placed to deliver this programme as we have strong R&D centres of excellence in core subject areas comprising Networks, Cognitive Science, Antennas together with cross-cutting centres such as the Centre for Intelligent Sensing (CIS) and the Centre for Digital Music (C4DM).

Aims of the Programme

The MSc in IoT is designed to meet the demand for a new kind of IT specialist with skills - those who can:

1. Engineer new interactive products – things and
2. Interconnect and embed these things into larger diverse systems and architectures;
3. Intelligently sense multi-modal data in physical and human environments;
4. Intelligently fuse and analyse the data collected.

Programme graduates will be able to pursue careers in IoT positions in Industry, as well as initiate research in multiple scientific domains that rely on performing advanced IoT.

What Will You Be Expected to Achieve?

Knowledge and understanding of the following items:

Academic Content:

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| A 1 | Evaluate the scientific, mathematical and software 'tools' relevant to the problem domain of IoT System Engineering |
| A 2 | Master the programming tools and techniques for processing heterogeneous things, including the wide use of tags, sensors and other Things in the physical world. |
| A 3 | Apply methods and techniques for automated and manual interaction with IoT devices, their services and their data |

Disciplinary Skills - able to:

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| B 1 | Evaluate the scientific, mathematical and software 'tools' relevant to the problem domain of IoT system engineering |
| B 2 | Develop novel techniques for interconnecting things sensing the environment and processing the data there from. |
| B 3 | Establish hypotheses on sensing the world, embedding and connect new things through relating physical world models with theoretical models |

Attributes:

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| C 1 | Engage critically with knowledge in the domain of IoT System Engineering, intelligent sensors and data analytics |
| C 2 | Develop a global perspective on how to engineer new things, intelligently sense the environment and analyse the data |
| C 3 | Develop new information, communication technology expertise in the domain |

How Will You Learn?

Each non-project-based course unit involves lectures, problem solving coursework and practical sessions. Lectures are used to

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introduce principles and methods and also to illustrate how they can be applied in practice. Coursework allows students to develop their skills in problem solving and to gain practical experience.

Tutorial sessions actively engage students on applying the techniques and tools presented in the lectures to solve practical problems. These sessions take the form of exercise classes and programming laboratories under the guidance of the teaching staff. In addition to the final year project, other modules introduce project working skills.

How Will You Be Assessed?

The assessment of the taught course units takes place through a written examination and coursework.

The final year project is examined on the basis of a written report, a formal oral presentation, and a demonstration of the piece of software developed or the insights from the data analysis carried by the student. The projects will have two examiners each, with a third if there is disagreement.

How is the Programme Structured?

Please specify the full time and part time programme diets (if appropriate).

The programme is delivered over three semesters, the first two being the taught courses and the 3rd being the project; although students will start some preparation work for their projects in semesters 1 and 2.

Year 1

Semester 1 - 4 modules

ECS782P Introduction to IOT
ECS783P Enabling Communication Technologies for IOT
ECS764P Applied Statistics

One from the following:

ECS708P Machine Learning
ECS765P Big Data Processing
ECS766P Data Mining

Semester 2 - 4 modules

ECS725P Mobile Services
ECS726P Security and Authentication
ECS784P Data Analytics

One from the following:

ECS735P The Semantic Web
ECS757P Digital Media and Social Networks
ECS781P Cloud Computing

Programme Title: MSc in the Internet of Things (Data) with Industrial Experience

Semester 3
(must take and pass)
ECS750P – Project

Year 2

ECS744P Industrial Experience Project

Semester 3
(must take and pass)
ECS750P – Project

Academic Year of Study

| Module Title | Module Code | Credits | Level | Module Selection Status | Academic Year of Study | Semester |
|--------------|-------------|---------|-------|-------------------------|------------------------|----------|
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What Are the Entry Requirements?

A high (2:1) honours BSc in Computer Science, Electronic Engineering, Maths, Physics or related disciplines is required. International students must have English Language skills to a recognised standard. The minimum requirement is: IELTS 6.5

Good knowledge of computer programming (in a modern procedural language such as C or in an Object-oriented programming language such as C++,Java or Python) is highly recommended for students. Otherwise, students will need to select Advanced Program Design as the optional module for the first semester in order to fulfill the requirements for the remaining modules.

How Do We Listen and Act on Your Feedback?

The Staff-Student Liaison Committee provides a formal means of communication and discussion between Schools and its students. The committee consists of student representatives from each year in the school/institute together with appropriate representation from staff within the school/institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Staff-Student Liaison Committees meet regularly throughout the year.

Each school operates a Learning and Teaching Committee, or equivalent, which advises the School/Institute Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in this Committee's work in a number of ways, such as through student membership, or consideration of student surveys.

All schools operate an Annual Programme Review of their taught undergraduate and postgraduate provision. The process is normally organised at a School-level basis with the Head of School, or equivalent, responsible for the completion of the school's Annual Programme Reviews. Schools/institutes are required to produce a separate Annual Programme Review for undergraduate programmes and for postgraduate taught programmes using the relevant Undergraduate or Postgraduate Annual Programme Review pro-forma. Students' views are considered in this process through analysis of the NSS and module evaluations.

Academic Support

All students will be assigned a tutor, with whom they will have bi-weekly meetings. In addition the students will have all the standard induction, advice and supervisory arrangements normally offered to students within EECS.

The school handbook will be provided (and made accessible at all times) to students, where all the channels of support will be outlined. These include the support channels within the school and also those available at College level.

Programme-specific Rules and Facts

N/A

Specific Support for Disabled Students

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:

- Finding out if you have a specific learning difficulty like dyslexia
- Applying for funding through the Disabled Students' Allowance (DSA)
- Arranging DSA assessments of need
- Special arrangements in examinations
- Accessing loaned equipment (e.g. digital recorders)
- Specialist one-to-one "study skills" tuition
- Ensuring access to course materials in alternative formats (e.g. Braille)
- Providing educational support workers (e.g. note-takers, readers, library assistants)
- Mentoring support for students with mental health issues and conditions on the autistic spectrum.

Links With Employers, Placement Opportunities and Transferable Skills

The staff involved in the IoT MSc have strong links and research collaboration with industrial partners including IBM, HP, BBC, and Tech City IT startups. Several of these companies will be involved in the teaching activities, providing guest lectures, as well as business use cases for applying IoT Engineering techniques.

Additionally, several of the MSc projects offered to the students will be performed in collaboration with an industry partner, including summer placement opportunities.

Students will be able to undertake the MSc with Industrial Experience, which includes the opportunity to undertake a placement between the taught modules and the project. The placement is supported by a dedicated Industrial Placement Manager.

Programme Specification Approval

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Person completing Programme Specification

Jennifer Richards

Person responsible for management of programme

Rupal Vaja

**Date Programme Specification produced/amended
by School Learning and Teaching Committee**

18th Jan 2017

**Date Programme Specification approved by
Taught Programmes Board**