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Programme Specification (PG)

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) Internet of Things and Future Networks
Name of interim award(s):	PGCert, PGDip
Duration of study / period of registration:	1 Year FT
Queen Mary programme code(s):	I1T3
QAA Benchmark Group:	Computing
FHEQ Level of Award:	Level 7
Programme accredited by:	
Date Programme Specification approved:	
Responsible School / Institute:	School of Electronic Engineering & Computer Science

Schools / Institutes which will also be involved in teaching part of the programme:
N/A

Collaborative institution(s) / organisation(s) involved in delivering the programme:
N/A

Programme outline

This is an exciting new program that merges and evolves and replaces the current MSc IoT and MSc Telecoms courses into a joint MSc called MSc Internet of things (IoT) and Future Networks. This (new) course is being conceived as an evolution of the current/previous MSc IoT that adds far stronger support for (future) networks.

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. IoT will drive the need for new future networks that will in turn facilitate the uptake of IoT. For example, because of the need for lower power wide area networks (LPWAN) to connect things, the need to connect many more densely spatially distributed things in addition to people (hence, the need for new Cellular phone network generations such as 5G and 6G (from 2030 to enable this)), greater machine to machine (M2M) 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

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centres of excellence in core subject areas comprising Networks and Systems, Communication Systems Research (CSR) Antennas & Electromagnetics, Cognitive Science, together with cross-cutting centres such as the Centre for Intelligent Sensing (CIS) and the QMUL IoT lab.

Aims of the programme

This MSc is designed to meet the demand for a new kind of IT specialist with skills - those who can:
1. Engineer new interactive products, things, or smart objects;
2. Interconnect and embed these things into larger diverse systems and architectures;
3. 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?

An in depth knowledge both theoretically and practically of IoT-driven telecoms and IoT driven data science and AI.

Academic Content:

A1	Evaluate the scientific, mathematical and software 'tools' relevant to the problem domain of IoT System Engineering
A2	Master the programming tools and techniques for processing heterogeneous things, including the wide use of tags, sensors and other Things in the physical world.
A3	Apply methods and techniques for automated and manual interaction with IoT devices, their services and their data

Disciplinary Skills - able to:

B1	Evaluate the scientific, mathematical and software 'tools' relevant to the problem domain of IoT system engineering
B2	Develop novel techniques for interconnecting things, sensing the environment and processing the data there from.
B3	Establish hypotheses on sensing the world, embedding and connect new things through relating physical world models with theoretical models

Attributes:

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C1	Engage critically with knowledge in the domain of IoT System Engineering, intelligent sensors and data analytics
C2	Develop a global perspective on how to engineer new things, intelligently sense the environment and analyse the data
C3	Develop new information, communication technology expertise in the domain

How will you learn?

Each taught course unit involves lectures, problem solving coursework and practical sessions. Lectures are used to 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 structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

The full-time 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 (Sem A or 1 and B or 2. The course is split into two Streams: Future networks driven (stream) or AI driven (stream) - this is the default stream if none is specified.

SEM A or 1
Stream: AI
ECS782P - Introduction to IoT
ECS783P - Enabling Communications Technologies for IoT
ECS781P - Cloud computing
ECS7020P Principles of Machine Learning

Stream: Future Networks
ECS782P - Introduction to IoT
ECS783P - Enabling Communications Technologies for IoT
ECS781P - Cloud computing
ECS702P - Mobile and WLAN

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SEM B or 2
Stream: AI
ECS726P - Security & Authentication
ECS725P Mobile Services
ECS765P  Big Data Processing
ECS784P - Data Analytics

Stream: Future Networks
ECS726P - Security & Authentication
ECS725P Mobile Services
ECS7008P - Modelling & Performance
ECS7021P - 5G Mobile and Beyond

Semester  C or 3
ECS750P – Project
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Academic Year of Study   FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Introduction to IOT	ECS782P	15	7	Compulsory	1	Semester 1
Enabling Communication Technologies for IoT	ECS783P	15	7	Compulsory	1	Semester 1
Cloud Computing	ECS781P	15	7	Compulsory	1	Semester 1
Mobile and WLAN Technologies	ECS702P	15	7	Compulsory	1	Semester 1
Principles of Machine Learning	ECS7020P	15	7	Compulsory	1	Semester 1
Mobile Services	ECS725P	15	7	Compulsory	1	Semester 2
Security and Authentication	ECS726P	15	7	Compulsory	1	Semester 2
Big Data Processing	ECS765P	15	7	Compulsory	1	Semester 2
Modelling & Performance	ECS7008P	15	7	Compulsory	1	Semester 2
Data Analytics	ECS784P	15	7	Compulsory	1	Semester 2
5G Mobile and Beyond	ECS7021P	15	7	Compulsory	1	Semester 2

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Project Module	ECS750P	60	7	Core	1	Semester 3

What are the entry requirements?

Information on the entry requirements can be found at: www.qmul.ac.uk/postgraduate/taught/coursefinder/courses/internet-of-things-data-msc/

How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?

The Student-Staff Liaison Committee provides a formal means of communication and discussion between the School and its students. The committee consists of student representatives from each cohort, together with appropriate representation from School staff. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Student-Staff Liaison Committees meet four times a year, twice in each teaching semester.

Each semester, students are invited to complete a web-based module questionnaire for each of their taught modules, and the results are fed back through the SSLC meetings. The results are also made available on the student intranet, as are the minutes of the SSLC meetings. Any actions necessary are taken forward by the relevant Senior Tutor, who chairs the SSLC, and general issues are discussed and actioned through the School's Education Committee (SEC).

The School's SEC advises the Director of Education 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, including through student membership and consideration of student surveys and module questionnaires.

The School participates in the University's Annual Programme Review process, which supports strategic planning and operational issues for all undergraduate and taught postgraduate programmes. The APR includes consideration of the School's Student Experience Action Plan, which records progress on learning and teaching related actions on a rolling basis. Students' views are considered in the APR process through module questionnaires, among other data.

What academic support is available?

All students are assigned an academic advisor during induction week. The advisor 's role is to guide their advisees in their academic development including module selection, and to provide first-line pastoral support.

In addition, the School has a Senior Tutor for postgraduate students who provides second-line guidance and pastoral support for students, as well as advising staff on related matters.

Every member of teaching staff holds 2 open office hours per week during term-time.

Additional academic support is provided to those students who are successful in securing an industrial-linked project.

Programme-specific rules and facts

The programme adheres to the standard Academic Regulations for taught postgraduate programmes.

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How inclusive is the programme for all students, including those with disabilities?

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. The coordinator of this MSc also acts as the industrial project coordinator across all MScs offered by EECS.

Programme Specification Approval

Person completing Programme Specification:	Karen Finesilver
Person responsible for management of programme:	Stefan Poslad
Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:	27 Apr 2023
Date Programme Specification approved by Taught Programmes Board:	

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