

Programme Title: MSc Software Engineering



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:	MSc Software Engineering with Industrial Experience
Name of interim award(s):	PG Certificate and PG Diploma
Duration of study / period of registration:	24 Months
QMUL programme code(s):	H6L7
QAA Benchmark Group:	Computing
FHEQ Level of Award:	Level 7
Programme accredited by:	BCS The Chartered Institute for IT
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:

NA

Institution(s) other than QMUL that will provide some teaching for the programme:

NA

Programme outline

Whether it's the computers in our offices, the smartphones in our pockets, the electrics in our cars or the technology that enables us to monitor patients in critical care, software is at the heart of our society.

This MSc programme focuses on advanced theoretical and practical techniques in program design, and the management of software project risk. It includes training in vital areas such as security, specification, risk management, usability, and design integrity.

The programme includes a year in industry which takes place in year 2.

Aims of the programme

This programme will:

- Teach you advanced techniques in program design
- Allow you to study key issues of interactive system design

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- Teach you the mathematical foundations of software and the practical application of these techniques
- Focus on discovering ways of mitigating risk in large scale software engineering projects
- Enable you pursue roles in areas such as software design and engineering, web development, project management and IT consulting.

The aims of the placement year are to:

- Ground the taught components of the programme in practical experience at a scale not possible within the College;
- Improve career preparation, giving students a better understanding of future career options and enhancing their career prospects.

What will you be expected to achieve?

Students completing the course will develop some of the following capabilities: design complex software systems, with informed selection between alternative architectures understand mathematical foundations of software and apply advanced tools to demonstrate properties of systems or software design for usability and assess usability, using models of user, interfaces and dialogue understand and apply risk management principles to software projects demonstrate skills in scholarship, communications (written, verbal), planning and research relevant to both industrial and academic practice.

Academic Content:

A 1	Theories, principles and techniques of software development
A 2	Programming languages, approaches to program design, testing and evaluation
A 3	Risk analysis and management, including with respect to real-time and critical systems

Disciplinary Skills - able to:

B 1	Design and implement software systems
B 2	Develop test plans for software produced by themselves or others
B 3	Design and critically evaluate human-computer interfaces
B 4	Design and implement data structures that are appropriate to a given software solution
B 5	Critically reflect on their own performance in software projects and apply to future projects

Attributes:

C 1	Integrate scholarship, research and professional activities with software engineering in a developing professional career
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C2	Evaluate their practice and engage in continuing professional development
C3	

How will you learn?

Each non-project-based module normally 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. Practical sessions provide students with guidance and help while solving a problem. These lessons take the form of exercise classes and programming laboratories that allow the students to learn-by-doing in order to complement the lectures.

Individual projects are undertaken during the summer months under the supervision of an academic member of staff with whom there are normally weekly consultancy meetings. These are used for students to report on their progress, discuss research and design issues and plan their future work. This develops and reinforces students' ability to communicate technical ideas clearly and effectively. The Projects Coordinator also runs a thread of taught sessions to support the project module. A number of industrial-linked projects may be offered each year, which students can apply for.

How will you be assessed?

The assessment of taught modules normally consists of a combination of written examination and coursework.

The project is examined on the basis of a written report, a formal oral presentation, and, where applicable, a demonstration of any software and/or hardware developed by the student.

The industrial placement is assessed by a combination of written report, viva, learning journal and 2 employer evaluations. The first employer evaluation takes place a few months into the placement and the second takes place shortly before the end of the placement. Each evaluation involves employer and student jointly setting appropriate objectives within a structured framework of categories; progress is later measured against these objectives using set marking criteria.

How is the programme structured?

Please specify the full time and part time programme diets (if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

Semester 1

ECS713P Functional Programming (15 credits)

ECS715P Program Specifications (15 credits)

Select 2 from:

ECS765P Big Data Processing (15 credits)

ECS708P Machine Learning (15 credits)

ECS789P Semi-Structured Data and Advanced Data Modelling (15 credits)

Semester 2

ECS733P Interactive Systems Design (15 credits)

ECS773P Bayesian Decision and Risk Analysis (15 credits)

Further options from:

ECS727P Real Time & Critical Systems (15 credits)

ECS737P Software Analysis and Verification (15 credits)

ECS726P Security and Authentication (15 credits)

ECS735P The Semantic Web (15 credits)

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ECS781P Cloud Computing (15 credits)
ECS796P Distributed Systems (15 credits)

Semester 3
ECS751P Project (60 credits)

Year 2
ECS774P Industrial Placement Project

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Functional Programming	ECS713P	15	7	Compulsory	1	Semester 1
Program Specifications	ECS715P	15	7	Compulsory	1	Semester 1
Big Data Processing	ECS765P	15	7	Elective	1	Semester 1
Machine Learning	ECS708P	15	7	Elective	1	Semester 1
Semi-Structured Data and Advanced Data Modelling	ECS789P	15	7	Elective	1	Semester 1
Interactive Systems Design	ECS733P	15	7	Compulsory	1	Semester 2
Bayesian Decision and Risk Analysis	ECS773P	15	7	Compulsory	1	Semester 2
Real Time & Critical Systems	ECS727P	15	7	Elective	1	Semester 2
Software Analysis and Verification	ECS737P	15	7	Elective	1	Semester 2
Security and Authentication	ECS726P	15	7	Elective	1	Semester 2
The Semantic Web	ECS735P	15	7	Elective	1	Semester 2
Cloud Computing	ECS781P	15	7	Elective	1	Semester 2
Distributed Systems	ECS796P	15	7	Elective	1	Semester 2

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Project	ECS751P	60	7	Core	1	Semester 3

Academic Year of Study FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Industrial Placement Project	ECS774P	0	7	Core	2	Semesters 1-3

What are the entry requirements?

Further information on our entry requirements can be found at <http://eecs.qmul.ac.uk/postgraduates/entry-requirements/>

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 Student Experience Learning Teaching And Assessment (SETLA) Committee .

The School's SETLA Committee advises the 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, including through student membership and consideration of student surveys and module questionnaires.

The School participates in the College'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 Taught

Programmes Action Plan, which records progress on learning and teaching related actions on a rolling basis. Students' views are considered in the APR process through analysis of the NSS and 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.

EEvery 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, with a special regulation for a progression point after the taught component.

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 School has a wide range of industrial contacts secured through research projects and consultancy, our Industrial Experience programme and our Industrial Advisory Panel.

The Industrial Advisory Panel works to ensure that our programmes are state-of-the-art and match the changing requirements of this fast-moving industry. The Panel includes representatives from a variety of Computer Science oriented companies ranging from SMEs to major blue-chips. These include: Microsoft Research, IBM, The National Physical Laboratory, National Instruments, PA Consulting, Rohde and Schwarz, O2, Cisco Systems, ARM, Selex and BAE Systems.

Recent graduates have found employment as IT consultants, specialist engineers, web developers, systems analysts, software designers and network engineers in a wide variety of industries and sectors. A number of students also go on to undertake PhDs in electronic engineering and computer science. Merrill Lynch, Microsoft, Nokia, Barclays Capital, Logica,, Credit Suisse, KPMG, Transport for London, Sky and Selex ES are among the organizations that have recently employed graduates of EECS programmes.

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Transferable skills are developed through a variety of means, including embedding of QM Graduate Attributes in taught modules and the summer project, together with the opportunity to participate in extra-curricular activities, e.g. the School's E++ Society, the School's Annual Programming Competition and external competitions with support from the School.

Students have the opportunity to undertake an industrial-linked project in the summer - these are very competitive.

Programme Specification Approval

Person completing Programme Specification:

Rupal Vaja

Person responsible for management of programme:

Tony Stockman

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

29th January 2018

Date Programme Specification approved by Taught Programmes Board: