Queen Mary
University of London

Programme Specification

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 Security
Name of Interim Award(s)	PG Certificate and PG Diploma
Duration of Study / Period of Registration	12 Months FT, 24 Months PT
QM Programme Code / UCAS Code(s)	H7L7
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 which will also be involved in teaching part of the programme

NA

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

NA

Programme Outline

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.

Security, authentication and identity management have grown substantially in importance in recent years, and there is significant demand in both the commercial and national/local government sectors for software engineers with a good grasp of these areas hence introducing a pathway in Security.

Aims of the Programme

The programme aims to teach architecture alternatives for software design (patterns of software design and component technologies) and for information handling (structured information, databases), the key issues of interactive system design, leading to the ability to identify issues and trade-offs in the design of interaction and to be able to invent and evaluate alternative solutions to design problems. Graduates should have an understanding of the mathematical foundations of software and the practical application of these techniques as well as management of software project risks and trade-offs between

Queen Mary
University of London

different quality attributes. They will also have gained essential transferable skills for team work and research.

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
C 2	Evaluate their practice and engage in continuing professional development

How Will You Learn?

Each non-project-based module 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 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 are 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.

How is the Programme Structured?

Semester 1

At least one from:
ECS713P Functional Programming
ECS715P Program Specifications
ECS939P Big Data Processing

Further options from:

ECS708P Machine Learning
ECS789P Semi-Structured Data and Advanced Data Modelling
ECS793P Introduction to Object-Oriented Programming
ECS712P Design for Human Interaction

Semester 2

At least two from:
ECS727P Real Time & Critical Systems
ECS733P Interactive Systems Design
ECS737P Software Analysis and Verification
ECS738P Bayesian Decision and Risk Analysis
ECS760P Distributed Systems and Security

Further options from:
ECS725P Mobile Services
ECS726P Security and Authentication
ECS728P Business Technology Strategy
ECS735P The Semantic Web

Semester 3
ECS751P Project

Programme Title: MSc Software Engineering with Security

NB: Students will need to take and pass the following modules in order to be eligible for the pathway title MSc in Software Engineering with Security.

ECS726P - Security and Authentication (semester 2)
ECS760 - Distributed Systems and Security semester 2)
ECS715P - Program Specifications (semester 1)
ECS737P - Software Analysis and Verification (semester 2)
ECS738 - Bayesian Decision and Risk Analysis (semester 2)

Academic Year of Study

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
		15	7	Core	1	Semester 1

What Are the Entry Requirements?

The entry requirements are a good second class honours degree in Electronic Engineering, Computer Science, Mathematics or a related discipline. Applicants with unrelated degrees will be considered if there is evidence of significant relevant industrial experience.

For international students, English Language skills are required to a recognised standard. The minimum requirement is: IELTS 6.5 or TOEFL (IBT) 92. For students not quite meeting this requirement (e.g. IELTS 6.0), enrolling on a one month pre-sessional English Language course is required. These conditions are higher than standard College conditions.

How Do We Listen 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 Learning and Teaching Committee.

The School's Learning and Teaching 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.

Queen Mary
University of London

Academic Support

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.

Students will need to take and pass the following modules in order to be eligible for the pathway title MSc in Software Engineering with Security.

ECS726P - Security and Authentication (semester 2)
ECS760 - Distributed Systems and Security semester 1)
ECS715P - Program Specifications (semester 1)
ECS737P - Software Analysis and Verification (semester 2)
ECS738 - Bayesian Decision and Risk Analysis (semester 2)

The module profile of students on the MSc Software Engineering programme would be considered at the time of the SEB. We would check which modules students on the programme have taken, and note in the SEB minutes if the pathway title should be awarded.

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. Merril 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.

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	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	

Queen Mary
University of London