Queen Mary
University of London

Programme Specification (UG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	Bachelor of Science BSc Software Engineering for Business with Industrial Experience
Name of interim award(s):	CertHE, DipHE, BSc
Duration of study / period of registration:	4 years FT
QMUL programme code / UCAS code(s):	I1N1
QAA Benchmark Group:	Computing
FHEQ Level of Award :	Level 6
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

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

N/A

Programme outline

Software professional roles are the fastest-growing in the sector, so there is increased demand for employable and productive software engineering/design graduates. To meet this demand and address the technical skills gap, e-skills UK has collaborated with employers and universities to design the framework for this Tech Industry Gold degree programme. See http://www.softwaredevelopmentforbusiness.com/ for further details.

The content of this programme is divided into four main areas:
1. Technology
2. Project management
3. Personal and interpersonal skills
4. Business skills

Tech Industry Gold degrees are unique because:
* The undergraduate skills requirements curriculum has been designed with input from leading employers to ensure it is relevant to the needs of today's businesses. Employers involved include Accenture, BT, Capgemini, CA Technologies, Cisco Systems, Enternships, IBM, Logica, Ministry of Justice, and the NHS.

Queen Mary
University of London

Programme Title: BSc Software Engineering for Business with Industrial Experience

* Students receive employer support and engagement throughout their degree in the form of employer/student events, CV clinics, real project case studies, work placements and 'guru' lectures to enhance their employability and develop their professional skills.
* Employers can use these activities to gain early access to students and recruit the graduates who fit their business.
* Students have access to a wider online community beyond their university, enabling them to network with peers from other establishments and employers involved in the programme.
* Universities currently involved with e-skills degrees have seen an increase in student numbers, an improvement in the gender balance on the course and a significant increase in employability rates.
This programme provides the opportunity for you to undertake a one-year industrial placement between the second and final years of study. Support for identifying and applying for placements is provided by a dedicated Industrial Placement Manager.

Aims of the programme

Develop your technical skills: You'll study how software is built from start to finish, including: identifying problems that software can solve; finding out what your users need; developing software to solve these issues; testing the quality of the software; and documenting how to use it. With input from employers, the programme will also cover the latest technologies – hot topics like cloud computing, big data and cyber security.

Teach you project management skills: You'll learn how businesses manage large projects, and develop the skills you need to plan, design and deliver new software on time and within budget – key skills that employers look for.

Enhance your personal and interpersonal skills: Most software development is done in teams. The degree will prepare you for this, by boosting your interpersonal skills – how well you work with other people.

Expose you to opportunities to develop business skills: For long term success in your career, you'll not only need good technical skills, you'll also need to negotiate and communicate effectively with colleagues and customers; lead teams and projects; and understand how companies operate profitably. You'll learn these skills through the programme.

What will you be expected to achieve?

Students who successfully complete the programme will be able to:

QMUL Model

The QMUL Model is an innovative teaching and learning initiative that will broaden opportunities for Queen Mary undergraduates within and beyond higher education, supporting them to plan and manage their ongoing professional development. The Model is firmly grounded in the core QMUL values of respect for, and engagement with, the local area and communities, with a distinctive focus on enabling students to make a positive societal impact through leadership in their chosen field. The Model is organised around the key themes of:

- networking

- multi- and inter-disciplinarity

- international perspectives

- enterprising perspectives.

Students are required to study QMUL Model modules to the value of at least 10 credits at each year of undergraduate study. Model modules may be 5, 10 or 15 credits. Model modules are indicated within this programme specification.

In your first year of study, the Model module will be core or compulsory and will be situated within your home School or Institute. In subsequent years, students will be strongly encouraged to study at least one Model module beyond their home discipline(s), which could, for example, be in another School / Institute or area of QMUL or undertaken as a module outside of QMUL.

If Model module information is not provided on this programme specification for all subsequent years of study, this will be identified as your studies continue.

Where a Model module elective can be selected from an approved group of Model modules, no guarantee can be provided that your first choice of Model module will be available.

Academic Content:	
A1	Demonstrate understanding of the entire software development lifecycle from design through to deployment and maintenance
A2	Demonstrate broad knowledge of the software development sector, from both a technical and a business perspective
A3	Demonstrate technical knowledge and skills in key areas identified by contributing employers, and adapt this to new situations and contexts
A4	Understand and articulate business principles, structures, operations, procedures and cultures applicable to a career in a software development environment
A5	Show awareness of project, people and resource management principles and techniques

Disciplinary Skills - able to:	
B1	Undertake problem-solving and modelling tasks relevant to software development

B 2	Investigate, select, analyse, manipulate and manage information from a variety of technical and non-technical sources
B 3	Apply the technical skills learned in the taught component of the programme
B 4	Apply the technical skills learned in the taught component of the programme while on placement, and, vice versa, apply the technical skills learned while on placement when back in the final year of study
B 5	Appreciate the challenges associated with industry standard software development

Attributes:	
C 1	Have a global perspective and engage with the professional world
C 2	Learn continuously and develop the skills to influence, negotiate and lead
C 3	Display initiative and resilience in the face of new challenges
C 4	Use information for evidence-based decision-making and creative thinking
C 5	Apply different forms of communication in various social, professional and cultural settings

QMUL Model Learning Outcomes - Level 4:	
D 1	**(Networking) Identify and discuss their own career aspirations or relevant skills and knowledge and how they i**
D 2	**(Networking) Identify and discuss what their own role in their programme and/or subject discipline might mea**
D 3	**(International Perspectives) Consider the role of their discipline in diverse cultural and global contexts**

QMUL Model Learning Outcomes - Level 5:	
E 1	(Enterprising Perspectives) Demonstrate and evaluate how they have enhanced their own learning through engaging
E 2	(Networking) Evaluate and demonstrate their own attitudes, values and skills in the workplace and/or in the wider wo
E 3	(Networking) Evaluate and demonstrate evidence of their skills to support networking and how these have influenced

QMUL Model Learning Outcomes - Level 6:	
F 1	

Queen Mary
University of London

F 2	
F 3	

QMUL Model Learning Outcomes - Level 7:	
G 1	
G 2	
G 3	

How will you learn?

The teaching and learning strategies are tailored to the learning outcomes of the different modules. These will
include lectures, lab and tutorial sessions, practical and library-based research, presentations and group work. Lectures are used to introduce principles and methods and also to illustrate how they can be applied in practice, e.g. through examples and case studies. Lab and tutorial sessions will allow students to put these theoretical principles and methods into practice. Practical and library-based research will allow them to develop skills in review, investigative methods and critical analysis. Presentations and group work will enhance their team-working and communication skills. The overall profile of teaching and learning strategies is designed to foster the development of (i) Graduate Attributes, as captured in Queen Mary's Statement of Graduate Attributes and (ii) key skills, as captured in the e-skills UK endorsement criteria.

In addition, the programme includes a significant component of industrial input and experience. The series of "guru" lectures offers the opportunity for students to increase their awareness of the broader context of their discipline, hear a range of industrial speakers and ask questions. The industrial placement offers a real-world opportunity for them to apply the technical skills that they have learnt in the taught component of the programme. Students will receive full training in preparation for the placement, supported by the dedicated Industrial Placement Manager, who also provides support while they are out on placement.

Learning materials will be hosted on Queen Mary's tailored virtual learning environment, QMPlus. This will also provide access to announcement and discussion forums used for asynchronous support.

How will you be assessed?

Taught modules are usually assessed through a combination of examination and coursework, as appropriate for the content and focus of each individual module. Laboratory-based modules are often assessed through practical coursework, while more theoretical modules may be assessed through in-class tests, exercise sheets or written assignments. Project work, both group and individual, forms a significant component of the assessment - project modules are assessed on the basis of a written report, oral presentation and demonstration of the concrete outcomes of the module, e.g. developed software. The assessment for the placement year includes an employer evaluation and the production of a reflective learning log, in addition to a report and oral presentation.
In addition to summative assessment, the programme provides regular opportunities for formative feedback, e.g. through the submission of a draft report for project modules. The School has a feedback policy, which stipulates standard requirements for acceptable types and timing of feedback. The School also uses the TurnItIn plagiarism detection system, and students will have the opportunity to submit some formative assignments to TurnItIn for feedback on the correctness and effectiveness of their referencing.

Queen Mary
University of London

How is the programme structured?

Please specify the full time and part time programme diets (if applicable). Please also outline the QMUL Model arrangements for each year of study. The description should be sufficiently detailed to fully define the structure of the diet.

Year 1 Modules
Semester 1
ECS401U Procedural Programming (15 credits)
ECS404U Computer Systems and Networks (15 credits)
ECS407U Logic and Discrete Structures (15 credits)
ECS427U Professional and Research Practice (15 credits)
Semester 2
ECS414U Object Oriented Programming (15 credits)
ECS417U Fundamentals of Web Technology (15 credits)
ECS419U Information Systems Analysis (15 credits)
ECS421U Automata and Formal Languages (15 credits)
Year 2 Modules
Semester 3
ECS501U C Programming (15 credits)
ECS505U Software Engineering (15 credits)
ECS519U Database Systems (15 credits)
ECS529U Algorithms and Data Structures 15 credits)
Semester 4
ECS506U Software Engineering Project (15 credits)
ECS518U Operating Systems (15 credits)
EECS522U Graphical User Interfaces (15 credits)
EECS524U Internet Protocols and Applications (15 credits)

Year 3 Modules
Semester 5 and 6
ECS550U Industrial Experience Project (30 credits)

Final Year Modules
Semester 6
ECS635U Project (30 credits)
ECS639U Web Programming (15 credits)
ECS646U Software Development and Quality (15 credits)
Plus one module from:
ECS607U Data Mining (15 credits)
ECS609U Project Risk Management (15 credits)
ECS610U Computer Graphics (15 credits)
ECS640U Big Data Processing (15 credits)
ECS642U Embedded Systems (15 credits)
ECS650U Semi-Structured Data and Advanced Data Modelling (15 credits)
Semester 7
ECS635U Project (cont) (30 credits)
Plus three modules from:
ECS605U Image Processing (15 credits)
ECS612U Interaction Design (15 credits)
ECS622U Product Development (15 credits)
ECS629U Artificial Intelligence (15 credits)
ECS637U Digital Media and Social Networks (15 credits)
ECS647U Bayesian Decision and Risk Analysis (15 credits)
ECS655U Security Engineering (15 credits)
ECS656U Distributed Systems (15 credits)

Programme Title: BSc Software Engineering for Business with Industrial Experience

Academic Year of Study   FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Professional and Research Practice	ECS427U	15	4	Compulsory	1	Semester 1	Yes
Procedural Programming	ECS401U	15	4	Compulsory	1	Semester 1	
Computer Systems and Networks	ECS404U	15	4	Compulsory	1	Semester 1	
Logic and Discrete Structures	ECS407U	15	4	Compulsory	1	Semester 1	
Object Oriented Programming	ECS401U	15	4	Compulsory	1	Semester 1	
Fundamentals of Web Technology	ECS417U	15	4	Compulsory	1	Semester 1	
Information Systems Analysis	ECS419U	15		Compulsory	1	Semester 1	
Automata and Formal Languages	ECS421U	15		Compulsory	1	Semester 1	

Academic Year of Study   FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
C Programming	ECS501U	15	5	Compulsory	1	Semester 1	
Software Engineering	ECS505U	15	5	Compulsory	1	Semester 1	
Database Systems	ECS519U	15	5	Compulsory	1	Semester 1	
Algorithms and Data Structures	ECS529U	15	5	Compulsory	1	Semester 1	

Academic Year of Study   FT - Year 2

Programme Title: BSc Software Engineering for Business with Industrial Experience

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Software Engineering Project	ECS506U	15	5	Compulsory	2	Semester 2	Yes
Operating Systems	ECS518U	15	5	Compulsory	2	Semester 2	
Graphical User Interfaces	ECS522U	15	5	Compulsory	2	Semester 2	
Internet Protocols and Applications	ECS524U	15	5	Compulsory	2	Semester 2	

Academic Year of Study   FT - Year 3

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Industrial Placement Poject	ECS550U	30	5	Core	3	Semesters 1 & 2	

Academic Year of Study   FT - Year 4

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Project	ECS635U	30	6	Core	4	Semesters 1 & 2	
Web Programming	ECS639U	15	6	Compulsory	4	Semester 1	
Software Development and Quality	ECS646U	15	6	Compulsory	4	Semester 1	
Data Mining	ECS607U	15	6	Compulsory	4	Semester 1	
Project Risk Management	ECS609U	15	6	Elective	4	Semester 1	
Computer Graphics	ECS610U	15	6	Elective	4	Semester 1	
Big Data Processing	ECS640U	15	6	Elective	4	Semester 1	

Queen Mary
University of London

Programme Title: BSc Software Engineering for Business with Industrial Experience

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Embedded Systems	ECS642U	15	6	Elective	4	Semester 1	
Semi-Structured Data and Advanced Modelling	ECS650U	15	6	Elective	4	Semester 1	
Image Processing	ECS605U	15	6	Elective	4	Semester 2	
Interaction Design	ECS612U	15		Elective	4	Semester 2	
Product Development	ECS622U	15		Elective	4	Semester 2	
Artificial Intelligence	ECS629U	15		Elective	4	Semester 2	
Digital Media and Social Networks	ECS637U	15		Elective	4	Semester 2	
Bayesian Decision and Risk Analysis	ECS47U	15		Elective	4	Semester 2	
Security Engineering	ECS655U	15		Elective	4	Semester 2	
Distributed Systems	ECS656U	15		Elective	4	Semester 2	

What are the entry requirements?

Further information about the entry requirements for this programme can be found at:

http://www.eecs.qmul.ac.uk/undergraduates/entry-requirements/

How will the quality of the programme be managed and enhanced?

EECS has a Student Experience Teaching Learning and Assessment (SELTA) structure which enables programmes to be both managed and enhanced.

The Structure allows for subject level teaching groups and programme coordinators to regularly evaluate the content and delivery of each programme. Feedback from module evaluations and SSLC meetings are fed into these groups and this provides an opportunity for student feedback to be incorporated into the programmes.

Additionally, programme coordinators work with the Director of Taught Programmes to ensure each programme is current and can be delivered effectively.

Queen Mary
University of London

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?

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

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

The School also has a Student Support Officer who is the first point of contact regarding all matters.

Every member of Teaching Staff holds 2 open office hours per week during term time.

Programme-specific rules and facts

Further information on the Academic Regulations can be found at http://www.arcs.qmul.ac.uk/media/arcs/policyzone/academic/Academic-Regulations-2017-18.pdf

In addition to this the programme does have special regulations (further details are available in the Academic Regulations):
1.   There is a requirement for students to achieve a minimum mark of 30.0 in every module, and to pass the project outright (in addition to the standard award rules) in order to achieve the intended, accredited, award.
2.   The exit award and the field of study of the exit award will be dictated by the specific modules passed and failed by a student.

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 framework for this degree has been developed by e-Skills UK as a collaboration between some of the UK's leading companies and universities. It is a unique programme and it has proved over the last seven years that there is a clear demand from students and industry for a degree that combines business and technical learning objectives with business skills in order to produce graduates who are ready for the workplace.

The School of Electronic Engineering & Computer Science also has a wide range of industrial contacts secured through research projects and consultancy, our well-established Industrial Experience programmes and our Industrial Advisory Board. The Industrial Advisory Board includes representatives from a variety of Computer Science oriented companies ranging from SMEs to major blue-chips. These include: Microsoft Research, Royal Bank of Scotland, BT Labs, Oaklodge Consultancy, Intel Research, The Usability Company, Hewlett Packard Labs and Arclight Media Technology Limited

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 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.

Programme Specification Approval

Person completing Programme Specification:

Person responsible for management of programme:

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

Date Programme Specification approved by Taught Programmes Board:

Queen Mary
University of London