



## 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:	BSc Mathematics with Actuarial Science BSc Mathematics with Actuarial Science with Year Abroad BSc Mathematics with Actuarial Science with Professional Placement
Name of interim award(s):	CertHE, DipHE
Duration of study / period of registration:	3/4 years
QMUL programme code / UCAS code(s):	UBSF-QMMATH1-UMMASACT / G1N3; UBSF-QMMATG1-UMMAAACA / G
QAA Benchmark Group:	Mathematics, statistics and operational research
FHEQ Level of Award :	Level 6
Programme accredited by:	Institute and Faculty of Actuaries
Date Programme Specification approved:	
Responsible School / Institute:	School of Mathematical Sciences

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

School of Business & Management

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

### Programme outline

Actuaries deal with uncertainties of future events, drawing on their mathematical skills, in particular in probability and statistics. The BSc in Mathematics with Actuarial Science is a 3-year taught programme which combines all the elements of a generalist undergraduate mathematics degree with a large number of specialist modules. It thus provides solid technical skills in mathematics and actuarial science, as well as economics and financial reporting, to prepare for a career as an actuary or a related career in the financial sector. Successful students will be able to obtain exemptions from up to eight of the Core Technical Examinations of the Institute and Faculty of Actuaries.

The programme is designed to deliver an integrated package of mathematical, computational and business knowledge which will prepare students for the job market. The programme provides useful skills including project and group work, as well as presentational skills, some of which are delivered via compulsory, non credit bearing, Actuarial Professional Development modules in the first and second years.

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The School recognises the benefits of short placements and internships during vacations and will encourage and try to facilitate these at suitable companies in London, although it cannot guarantee these will be possible.

### **Aims of the programme**

The programme is designed to attract high performing students in Mathematics who are interested in careers in the financial services sector, in particular insurance or pensions where qualified actuaries are sought after and attract high salaries. By introducing many of the skills which a qualified actuary needs at an early stage in their development it also allows students to decide whether they are perhaps more suited to a general financial, statistical or other career. The programme contains a range of both general and specialist modules.

### **What will you be expected to achieve?**

Students who successfully complete this 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:	
A 1	Core techniques in mathematics.
A 2	Statistical modelling relevant to actuarial and business applications.
A 3	Techniques of financial modelling.
A 4	Knowledge of economics and financial reporting.

Disciplinary Skills - able to:	
B 1	Solve mathematical problems using a range of analytical tools.
B 2	Apply techniques from probability and statistics to problems in insurance and pensions.

B 3	Report results of analyses appropriately.
B 4	Understand the legal, social, ethical and professional issues of being an actuary.

Attributes:	
C 1	Integrate knowledge from many different fields.
C 2	Choose the appropriate mathematical tools for solving particular problems.
C 3	Have a broad knowledge of the work of an actuary.

QMUL Model Learning Outcomes - Level 4:	
D 1	<b>(Networking) Identify and discuss their own career aspirations or relevant skills and knowledge and how they i</b>
D 2	<b>(Networking) Identify and discuss what their own role in their programme and/or subject discipline might mea</b>

QMUL Model Learning Outcomes - Level 5:	
E 1	(Networking) Evaluate and demonstrate their own attitudes, values and skills in the workplace and/or in the wider wo
E 2	(Enterprising Perspectives) Recognise and prioritise areas for developing their own enterprising perspectives

QMUL Model Learning Outcomes - Level 6:	
F 1	
F 2	
F 3	

QMUL Model Learning Outcomes - Level 7:

G 1

G 2

G 3

### How will you learn?

Throughout the three year programme, you will attend lectures in a range of subject areas. Many lecturers make their lecture notes and other resources available to students via our online learning environment, QMplus. You will also attend examples classes and tutorials, where you can receive one-to-one support in learning how to solve mathematical problems. For some statistics and computing modules, you will undertake practical assignments in the computer laboratories, again with plenty of personal support.

In addition, you will be expected to spend a considerable amount of your own time in independent study, reviewing the material covered in the lectures, and working through various coursework assignments to help you fully understand how to apply your new knowledge.

### How will you be assessed?

The majority of our modules are assessed by written examination, although some also involve an element of assessed coursework, or practical work using computers.

### 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.

All first-year Mathematical Sciences students must take and pass MTH3100 Essential Mathematical Skills in order to progress to the second year of a Mathematical Sciences degree programme.

Year 1

MTH3100 [3] Essential Mathematical Skills (0 Credit Core module)

8 compulsory level 4 modules

MTH4100 [4] Calculus I

MTH4114 [4] Computing and Data Analysis with Excel

MTH4113 [4] Numbers, Sets and Functions

MTH4107 [4] Introduction to Probability

MTH4101 [4] Calculus II

MTH4115 [4] Vectors and Matrices

MTH4116 [4] Probability and Statistics I

BUS137 [4] Economics for Business Management

Compulsory zero credit module covering both semesters:

MTH4112 [4] Actuarial Professional Development I

Year 2

(Semester A)

Four compulsory modules

MTH5212 [5] Applied Linear Algebra

BUS241 [5] Corporate Financial Reporting

MTH5129 [5] Probability and Statistics II

MTH5124 [5] Actuarial Mathematics I

(Semester B)

Three Compulsory Modules

MTH5120 [5] Statistical Modelling I

MTH5126 [5] Statistics for Insurance

MTH5125 [5] Actuarial Mathematics II

Choose another 15 credits

Compulsory zero credit module covering both semesters:

MTH5127 [5] Actuarial Professional Development II

Year 3

Seven compulsory modules:

MTH6139 [6] Time Series

MTH6154 [6] Financial Mathematics I

MTH6157 [6] Survival Models

BUS341 [6] Corporate Financial Management

MTH6141 [6] Random Processes

MTH6112 [6] Actuarial Financial Engineering

MTH6113 [6] Mathematical Tools for Asset Management

Choose one module from

MTH6101 [6] Introduction to Machine Learning

MTH6103 [6] Actuarial Project

MTH6128 [6] Coding Theory

MTH6142 [6] Complex Networks

BUS300 [6] Innovation & Entrepreneurship

BUS304 [6] International Business

BUS331 [6] Company Valuation

BUS334 [6] Corporate Governance and Accountability

BUS346 [6] Social Network Analysis

BUS350 [6] New Product Development

BUS329 [6] Corporate Law and Governance

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Essential Mathematical Skills	MTH3100	0	3	Core	1	Semesters 1 & 2	<input type="checkbox"/> No
Calculus I	MTH4100	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Computing and Data Analysis with Excel	MTH4114	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> Yes
Numbers, Sets and Functions	MTH4113	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> Yes
Introduction to Probability	MTH4107	15	4	Compulsory	1	Semester 1	<input type="checkbox"/>
Calculus II	MTH4101	15	4	Compulsory	1	Semester 2	<input type="checkbox"/>
Vectors and Matrices	MTH4115	15	4	Compulsory	1	Semester 2	<input type="checkbox"/>
Probability and Statistics I	MTH4116	15	4	Compulsory	1	Semester 2	<input type="checkbox"/>
Economics for Business Management	BUS137	15	4	Compulsory	1	Semester 2	<input type="checkbox"/>
Actuarial Professional Development I	MTH4112	0	4	Compulsory	1	Semesters 1 & 2	<input type="checkbox"/>

Academic Year of Study FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Applied Linear Algebra	MTH5212	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Actuarial Mathematics I	MTH5124	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Statistical Modelling I	MTH5120	15	5	Compulsory	2	Semester 2	<input type="checkbox"/> No
Statistics for Insurance	MTH5126	15	5	Compulsory	2	Semester 2	<input type="checkbox"/> No
Corporate Financial Reporting	BUS241	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No

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Actuarial Mathematics II	MTH5125	15	5	Compulsory	2	Semester 2	<input type="checkbox"/> No
Actuarial Professional Development II	MTH5127	0	5	Compulsory	2	Semesters 1 & 2	<input type="checkbox"/> No
Probability and Statistics II	MTH5129	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Introduction to Computer Programming	MTH5001	15	5	Elective	2	Semester 2	<input type="checkbox"/> Yes

Academic Year of Study FT - Year 3

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Time Series	MTH6139	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Financial Mathematics I	MTH6154	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Survival Models	MTH6157	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Corporate Financial Management	BUS341	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Random Processes	MTH6141	15	6	Compulsory	3	Semester 2	<input type="checkbox"/> No
Actuarial Financial Engineering	MTH6112	15	6	Compulsory	3	Semester 2	<input type="checkbox"/> No
Mathematical Tools for Asset Management	MTH6113	15	6	Compulsory	3	Semester 2	<input type="checkbox"/> No
Actuarial Project	MTH6153	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Coding Theory	MTH6108	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Complex Networks	MTH6142	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Innovation & Entrepreneurship	BUS300	15	6	Elective	3	Semester 2	<input type="checkbox"/> No



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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
International Business	BUS304	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Company Valuation	BUS331	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Corporate Governance and Accountability	BUS334	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Social Network Analysis	BUS346	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
New Product Development	BUS350	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Corporate Law and Governance	BUS329	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Introduction to Machine Learning	MTH6101	15	6	Elective	3	Semester 2	<input type="checkbox"/> No

### What are the entry requirements?

For UK applicants, we require 3 GCE A-levels at AAA–AAB including Mathematics at Grade A. Grade C or 4 in GCSE English Language is also required.

International Baccalaureate: Acceptable on its own and combined with other qualifications.  
Subjects and grades required: 34–36 points total including Higher Level Mathematics at grade 6.

Non-UK applicants: Equivalent qualifications may be accepted. IELTS: 6.0 (with a minimum of 5.5 in all sections) is required.

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

The quality of individual modules is monitored by DOTP and DUGS, and includes evaluation of student feedback through questionnaires, the Student Staff Liaison Committee, module registrations, exam performance, as well as direct observations of the lectures.

The quality and structure of the programme as a whole is the responsibility of the DoTP with support from DUGS, the Programme Director and the School's Teaching and Learning Committee. This includes revising the syllabuses of modules, and refining the module offering.

### How do we listen to and act on your feedback?

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

The School operates a Teaching and Learning Committee, which advises the School Director of Taught Programmes on all matters relating to the delivery of taught programmes at School level including monitoring the application of relevant QMUL

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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 the SSLC and consideration of student surveys.

The School operates an Annual Programme Review of all its taught provision. The process is organised at a School-level basis with the Director of Taught Programmes responsible for updating the School's Taught Programmes Action Plan. Students' views are considered in this process through analysis of student surveys and module evaluations.

### **What academic support is available?**

Each student is allocated a personal academic adviser, who acts as a first point of contact for general academic and pastoral support. Personal tuition is provided primarily through tutorial classes and visits to module organisers during their office hours, which are advertised on the web. Programme induction for new students begins during the enrolment period and extends into the first semester; it includes a series of presentations organised by the Student Support Officer. Each programme is assigned a Programme Director and all teaching is overseen by the Teaching and Learning Committee, which includes the Programme Directors and is chaired by the Director of Taught Programmes. Programmes are monitored continuously and reviewed every few years by the Teaching and Learning Committee.

### **Programme-specific rules and facts**

All first-year Mathematical Sciences students must pass Essential Mathematical Skills in order to progress to the second year of a Mathematical Sciences degree programme.

The exact details of which exemptions from examinations of the Institute and Faculty of Actuaries are awarded will be decided by representatives of the Institute by looking at individual examination scripts.

### **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 of Mathematical Sciences has established a Professional Advisory Board with representatives from Lloyds and other major employers of actuaries. It is hoped that this will enable students on the programme to have opportunities to gain insight into the actuarial profession.

The School recognises the importance of vacation internships and placement and is developing a database of employers offering or interested in placements and internships.

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## Programme Specification Approval

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**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:**