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 and Statistics BSc Mathematics and Statistics with Year Abroad BSc Mathematics and Statistics 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-UJMASSTA / GG31; UBSF-QMMATG1-UJMAASTY / GG
QAA Benchmark Group:	Mathematics, statistics and operational research
FHEQ Level of Award :	Level 6
Programme accredited by:	N/A
Date Programme Specification approved:	
Responsible School / Institute:	School of Mathematical Sciences

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

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

Programme outline

This programme is for students who have a mathematical aptitude and are also interested in drawing conclusions from data. It incorporates straight statistics as a specialist option. It combines training in rigorous mathematics, probability and statistical theory with analysis of data using statistical computing packages. Graduates obtain jobs requiring mathematical and statistical thinking; these jobs are in diverse areas such as finance, government, industry and teaching. They are also well prepared for further training in mathematics or statistics.

Aims of the programme

This programme aims to build statistical theory and methodology on mathematical foundations, especially probability theory. It aims to produce graduates who can apply probabilistic modelling to areas such as genetics, quantum physics and risk analysis,

and increasingly in the financial sector. Applications of probability and statistics are included, notably design of experiments, time series, and actuarial and financial mathematics.

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:

A1	reason clearly, critically and with rigour within a mathematical and statistical context, both theoretical and practical;
A2	choose appropriate mathematical and statistical methods and understand how to apply them in practical situations;
A3	verify that there is no obvious mismatch between the data, the real situation and the conclusions of the analysis.

Disciplinary Skills - able to:	
B1	be fluent and accurate in basic numerical skills;
B2	comprehend fundamental concepts and techniques of calculus, linear and abstract algebra, probability theory, statistical inference, linear models and other mathematical and statistical subjects;
B3	take notes, write up notes, plan revision, and learn independently;
B4	use e-mail for cooperation and the internet as a source of information, and have a sense of right and wrong ways of using these facilities;
B5	manage time and work cooperatively with fellow students;
B6	explain the interrelations among the mathematical subjects and how to use them in statistics;
B7	explain mathematical work, in appropriate detail, both to specialists and non-specialists;
B8	approach a practical statistical problem independently – for example, design an experiment, perform statistical modelling and data analysis;
B9	discuss statistical aspects of a practical problem presented by a scientist;
B10	use statistical computing packages and critically interpret their output.

Attributes:	
C1	acquire complex knowledge and apply it rigorously;
C2	connect information and ideas within their field of study;
C3	use writing for learning, reflection, and communication;
C4	adapt their understanding to new and unfamiliar settings;
C5	acquire new learning skills in a range of ways, both individually and collaboratively;
C6	use quantitative data confidently and competently;
C7	acquire transferable key skills to help with career goals and continuing education;
C8	develop effective spoken English and presentation skills;

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C9	use information for evidence-based decision-making and creative thinking.

QMUL Model Learning Outcomes - Level 4:

D1	**(Networking) Identify and discuss their own career aspirations or relevant skills and knowledge and how they i**
D2	**(Networking) Identify and discuss what their own role in their programme and/or subject discipline might mea**
D3	

QMUL Model Learning Outcomes - Level 5:

E1	(Networking) Evaluate and demonstrate their own attitudes, values and skills in the workplace and/or in the wider wo
E2	(Enterprising Perspectives) Recognise and prioritise areas for developing their own enterprising perspectives
E3	

QMUL Model Learning Outcomes - Level 6:

F1	
F2	
F3	

QMUL Model Learning Outcomes - Level 7:

G1	
G2	
G3	

How will you learn?

Teaching in most modules is primarily by formal lectures but may include guided reading. For all except some higher-level modules, teaching is supported by tutorial classes and/or computer laboratories. Teaching of reading and project modules is primarily by guided reading and weekly seminars or supervisions.

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Learning in most modules is by attending lectures, reading lecture notes and recommended text books, attempting exercises and asking questions in tutorial classes and/or computer laboratories and staff office hours.

How will you be assessed?

Assessment is normally primarily by written examination but for some modules may also include continuous assessment of coursework consisting of solutions to exercises, which are set weekly or fortnightly, and/or one or more tests. Summative coursework assessment or tests may typically contribute up to 10% of the assessment. Assessment of project modules is normally by a project report, presentation and, at the examiners' discretion, an oral examination.

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.

ll 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
MTH4200 [4] Calculus I
MTH4114 [4] Computing and Data Analysis with Excel
MTH4213 [4] Numbers, Sets and Functions
MTH4207 [4] Introduction to Probability
MTH4201 [4] Calculus II
MTH4104 [4] Introduction to Algebra
MTH42XX (should be the MTH42 version of the new module) Vectors and Matrices (renamed from MTH4203 [4] Geometry I)
MTH42XX (should be the MTH42 version of the new module) Probability and Statistics I (renamed from MTH4206 [4] Introduction to Statistics).

Year 2
Semester A
Three compulsory modules
MTH5112 [5] Linear Algebra I
MTH5123 [5] Differential Equations
Probability and Statistics II (renamed from MTH5122 Statistical Methods)

Semester B
Compulsory
MTH5120 [5] Statistical Modelling I

Choose two from:
MTH5100 [5] Algebraic Structures I
MTH5103 [5] Complex Variables
MTH5XXX [5] Linear Programming and Game Theory
MTH5126 [5] Statistics for Insurance

QMUL Model Module (May be taken in either semester)
Choose one from
MTH5XXX [5] Professional Skills and Data Analysis with SAS (QMmodel)

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MTH5XXX [5] Introduction to Computer Programming (QMmodel)
any 15 credit QMmodel Module

One Free choice (may be taken in either semester):
Choose any 15 credit module (electives from above are fine)

Year 3
Two Compulsory modules
MTH6134 [6] Statistical Modelling II
MTH6136 [6] Statistical Theory

Choose 60 credits from:
MTH6138 [6] Third Year Project (or Semester 6)
MTH6139 [6] Time Series
MTH6140 [6] Linear Algebra II
MTH6154 [6] Financial Mathematics I
MTH6934 [6] Topics in Probability and Stochastic Processes

MTH6141 [6] Random Processes
MTH6142 [6] Complex Networks
MTH6155 [6] Financial Mathematics II
MTH6156 [6] Financial Mathematics III
MTH6909 [6] Bayesian Statistics
MTH6931 [6] Computational Statistics R

Choose a further 30 credits of level 5 or 6 modules.

Academic Year of Study   FT - Year 1

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	No
Calculus I	MTH4200	15	4	Compulsory	1	Semester 1	No
Computing and Data Analysis with Excel	MTH4114	15	4	Compulsory	1	Semester 1	Yes
Numbers, Sets and Functions	MTH4213	15	4	Compulsory	1	Semester 1	Yes
Introduction to Probability	MTH4207	15	4	Compulsory	1	Semester 1	No
Calculus II	MTH4201	15	4	Compulsory	1	Semester 2	No
Vectors and Matrices	MTH42XX	15	4	Compulsory	1	Semester 2	No

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Introduction to Algebra	MTH4104	15	4	Compulsory	1	Semester 2	No
Probability and Statistics I	MTH42XX	15	4	Compulsory	1	Semester 2	No

Academic Year of Study   FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Linear Algebra I	MTH5112	15	5	Compulsory	2	Semester 1	No
Differential Equations	MTH5123	15	5	Compulsory	2	Semester 1	No
Probability and Statistics II	MTH5XXX	15	5	Compulsory	2	Semester 1	No
Statistical Modelling I	MTH5120	15	5	Compulsory	2	Semester 2	No
Algebraic Structures I	MTH5100	15	5	Elective	2	Semester 2	No
Complex Variables	MTH5103	15	5	Elective	2	Semester 2	No
Linear Programming and Game Theory	MTH5XXX	15	5	Elective	2	Semester 2	No
Statistics for Insurance	MTH5126	15	5	Elective	2	Semester 2	No
Professional Skills and Data Analysis with SAS	MTH5XXX	15	5	Elective	2	Semester 1	Yes
Introduction to Computer Programming	MTH5XXX	15	5	Elective	2	Semester 2	Yes

Academic Year of Study   FT - Year 3

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
Statistical Modelling II	MTH6134	15	6	Compulsory	3	Semester 1	No
Statistical Theory	MTH6136	15	6	Compulsory	3	Semester 2	No
Time Series	MTH6139	15	6	Elective	3	Semester 1	No
Linear Algebra II	MTH6140	15	6	Elective	3	Semester 1	No
Financial Mathematics I	MTH6154	15	6	Elective	3	Semester 1	No
Topics in Probability and Stochastic Processes	MTH6934	15	6	Elective	3	Semester 1	No
Random Processes	MTH6141	15	6	Elective	3	Semester 2	No
Complex Networks	MTH6142	15	6	Elective	3	Semester 2	No
Financial Mathematics II	MTH6155	15	6	Elective	3	Semester 2	No
Financial Mathematics III	MTH6156	15	6	Elective	3	Semester 2	No
Bayesian Statistics	MTH6909	15	6	Elective	3	Semester 2	No
Computational Statistics	MTH6931	15	6	Elective	3	Semester 2	No
Third Year Project	MTH6138	15	6	Elective	3	Semesters 1 & 2	No

What are the entry requirements?

Our normal entry requirement is three GCE A-levels at grades AAB including grade A in Mathematics, or equivalent. Applicants also need at least grade C or 4 in GCSE English Language, or equivalent.

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.

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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 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.

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

A lot of our graduates go on to jobs directly related to their degree: for example, as a Statistics Officer for the Department of Transport. The Government is one of the largest employers of statisticians and has over 1,200 employed across a number of different departments. Other graduates have found positions in the finance sector with companies like Deloitte and Touche, or have gone on to work for the NHS and Pfizer, the pharmaceutical company. The combination of mathematical and statistical knowledge is very useful in such sectors. Many graduates take MSc courses in Medical Statistics, Financial Mathematics and other subjects. High-level numeracy is one of the most sought-after skills in the workplace and many opportunities are open to a mathematical sciences graduate.

Programme Specification Approval

Person completing Programme Specification:

Dr Mark Walters, DoTP

Person responsible for management of programme:

Dr Lawrence Pettit

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

7 Feb 2018

Date Programme Specification approved by Taught Programmes Board:

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