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	MSci Mathematics with Statistics
Name of Interim Award(s)	CertHE, DipHE, BSc
Duration of Study / Period of Registration	4 years
QM Programme Code / UCAS Code(s)	UMIF-QMMATH1-UMMASSTA / G1G3
QAA Benchmark Group	Mathematics, statistics and operational research
FHEQ Level of Award	Level 7
Programme Accredited by	Royal Statistical Society
Date Programme Specification Approved	
Responsible School / Institute	School of Mathematical Sciences

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

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

Programme Outline

This programme combines training to an advanced level in rigorous mathematics, probability and statistical theory with analysis of data using statistical computing packages. Graduates from the programme are well-placed to embark on further research in mathematics and/or statistics leading to a PhD, or to undertake employment requiring advanced mathematical and statistical skills. These jobs are in diverse areas such as finance, government, industry, and teaching.

Aims of the Programme

This programme is an extension of GG31 (BSc Mathematics and Statistics). It 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 financial mathematics. If students are interested in

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specialising in statistical theory or statistical applications, such as finance, the wide range of modules available provides the opportunity. This programme include a final year consisting of a 30-credit project and modules from the School of Mathematical Sciences' MSc programmes. This enables graduates to become independent learners of advanced mathematics and statistics.

What Will You Be Expected to Achieve?

Students who successfully complete this programme will be able to:

Academic Content:	
A1	reason clearly, critically and with rigour within an advanced 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;
A4	understand and use mathematics at graduate level such as algebra, topology, group theory, dynamical systems, measure theory, probability and stochastic processes, as well as applied statistics.

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 and write up notes, plan revision, learn independently, manage time and work cooperatively with fellow students;
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	explain the interrelations among mathematical subjects and how to use them in statistics, analyse a problem within a mathematical or statistical context and select appropriate mathematical or statistical tools to solve it;
B6	explain mathematical work, in appropriate detail, both to specialists and non-specialists, and discuss statistical aspects of a practical problem presented by a scientist;
B7	construct appropriate written mathematical or statistical arguments, tackle a substantial practical statistical problem independently, for example design an experiment involving statistical modelling and data analysis, and complete an advanced mathematical and/or statistical project;
B8	use statistical computer packages and interpret their output critically.

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

QMUL Model Learning Outcomes - Level 4:	
D1	Identify and discuss their own career aspirations or enterprise skills and knowledge and how they impact on others
D2	Identify and discuss what their own role in their programme and/or subject discipline might mean to them for future
D3	

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.

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.

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How is the Programme Structured?
Please specify the full time and part time programme diets (if appropriate).

In the first year, students take 8 compulsory level-4 modules. In the second year, they take 7 compulsory level-5 modules and choose 1 further level-5 module from a list. In the third year, they take 1 compulsory level-5 module, 4 compulsory level-6 modules, choose 2 level-6 modules from a list and have free choice of another 15 credits at level 5 or 6. In the final year, they take the compulsory Research Methods in Mathematical Sciences module and 30-credit MSci Project, choose 2 modules from a list, choose 15 credits from undergraduate MTH modules at level 7 and another 30 credits at level 7.

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.

For full details, please see http://qmplus.qmul.ac.uk/mod/book/view.php?id=489759.

QMUL Model

Students are required to undertake the equivalent of one module (15 credits in 2017/18) per year of study which has been identified as meeting the requirements of the QMUL Model. Each of these modules has been designed to combine the best of QMUL's academic excellence with your ability to identify and develop your skills, networks and experience. This will help to ensure you become a graduate who can undertake further study or secure graduate employment in areas that interest you, and will support your ability to position yourself to find the right job or opportunity for you. The relevant module for your first year of study in 2017/18 is indicated below.

Where more than one module is specified, this is because pertinent elements from these modules have been identified as being appropriate to the QMUL Model and when studied together, deliver the equivalent content of one 15-credit QMUL Model module.

The QMUL Model modules for future years and associated Learning Outcomes will be identified as your studies continue.

Should Professional, Statutory and Regulatory Body requirements apply to your programme of study, these will be taken into account in the specification of QMUL Model requirements.

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

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
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
Geometry I	MTH4203	15	4	Compulsory	1	Semester 2	No
Introduction to Algebra	MTH4104	15	4	Compulsory	1	Semester 2	No
Introduction to Statistics	MTH4206	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
Convergence & Continuity	MTH5104	15	5	Compulsory	2	Semester 1	No
Linear Algebra I	MTH5112	15	5	Compulsory	2	Semester 1	No
Probability Models	MTH5121	15	5	Compulsory	2	Semester 1	No
Statistical Methods	MTH5122	15	5	Compulsory	2	Semester 1	No
Algebraic Structures I	MTH5100	15	5	Compulsory	2	Semester 2	No
Differential & Integral Analysis	MTH5105	15	5	Compulsory	2	Semester 2	No
Statistical Modelling I	MTH5120	15	5	Compulsory	2	Semester 2	No
Complex Variables	MTH5103	15	5	Elective	2	Semester 2	No

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Differential Equations	MTH5123	15	5	Elective	2	Semester 2	No
Statistics for Insurance	MTH5126	15	5	Elective	2	Semester 2	No

Academic Year of Study FT - Year 3

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Mathematical Writing	MTH5117	15	5	Compulsory	3	Semester 1	No
Statistical Modelling II	MTH6134	15	6	Compulsory	3	Semester 1	No
Linear Algebra II	MTH6140	15	6	Compulsory	3	Semester 1	No
Algebraic Structures II	MTH6104	15	6	Elective	3	Semester 1	No
Chaos and Fractals	MTH6107	15	6	Elective	3	Semester 1	No
Combinatorics	MTH6109	15	6	Elective	3	Semester 1	No
Cryptography	MTH6115	15	6	Elective	3	Semester 1	No
Time Series	MTH6139	15	6	Elective	3	Semester 1	No
Financial Mathematics I	MTH6154	15	6	Elective	3	Semester 1	No
Design of Experiments	MTH6116	15	6	Compulsory	3	Semester 2	No
Statistical Theory	MTH6136	15	6	Compulsory	3	Semester 2	No
Coding Theory	MTH6108	15	6	Elective	3	Semester 2	No
Mathematical Problem Solving	MTH6124	15	6	Elective	3	Semester 2	No

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Metric Spaces and Topology	MTH6127	15	6	Elective	3	Semester 2	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

Academic Year of Study   FT - Year 4

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
MSci Project	MTH717U	30	7	Compulsory	4	Semesters 1 & 2	No
Research Methods in Mathematical Sciences	MTH700U	15	7	Compulsory	4	Semester 1	No
Topics in Probability and Stochastic Processes	MTH734U	15	7	Elective	4	Semester 1	No
Bayesian Statistics	MTH709U	15	7	Elective	4	Semester 2	No
Measure Theory and Probability	MTH716U	15	7	Elective	4	Semester 2	No
Computational Statistics	MTH731U	15	7	Elective	4	Semester 2	No

What Are the Entry Requirements?

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

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How Do We Listen 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.

Academic Support

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. This programme includes a final year of modules from the School of Mathematical Sciences MSc programmes and so leads directly to study for a doctoral degree or to careers in science and engineering requiring advanced technical knowledge.

Programme Specification Approval

Person completing Programme Specification

Dr Francis Wright, Director of Undergraduate Studies

Person responsible for management of programme

Dr Lawrence Pettit

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

18 Jan 2017

Date Programme Specification approved by Taught Programmes Board

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