



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:	MSci Mathematics; MSci Mathematics with Year Abroad
Name of interim award(s):	CertHE, DipHE
Duration of study / period of registration:	4/5 years
QMUL programme code / UCAS code(s):	UMIF-QMMATH1 / USMAS / G102 ; UMIF-QMMATG1 / USMAA / G12Y
QAA Benchmark Group:	Mathematics, statistics and operational research
FHEQ Level of Award :	Level 7
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:

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Collaborative institution(s) / organisation(s) involved in delivering the programme:

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Programme outline

This programme provides mathematical training to an advanced level, with a concentration on the abstract and formal structures that form the core of modern mathematics at research level. Graduates from the programme are well-placed to embark on mathematical research leading to a PhD, or to undertake employment requiring advanced analytical skills and critical judgement.

Aims of the programme

This programme is an extension of G100 (BSc Mathematics). It aims to teach a wide range of topics covering pure and applied mathematics, probability and statistics to an advanced level. The broad range of second, third and final-year options aims to allow graduates to benefit from our research strengths. The first year covers essential fundamentals but the pathways in the last two years aim to allow students to follow their own preferences.

Whether students are interested in specialising in statistics, finance, pure or applied mathematics, the wide range of modules available provides the opportunity. The final year of the project consists of a 30-credit project and modules from the School's MSc programmes. This enables graduates to become independent learners of advanced mathematics.

What will you be expected to achieve?

Students who successfully complete this programme will be expected to achieve all of the learning outcomes shown below.

Please note that the following information is only applicable to students who commenced their Level 4 studies in 2017/18, or 2018/19

In each year of undergraduate study, students are required to study modules to the value of at least 10 credits, which align to one or more of the following themes:

- networking
- multi- and inter-disciplinarity
- international perspectives
- enterprising perspectives.

These modules will be identified through the Module Directory, and / or by your School or Institute as your studies progress.

Academic Content:

A 1	reason clearly, critically and with rigour within a mathematical context;
A 2	construct appropriate written mathematical arguments;
A 3	analyse a problem within a mathematical context and select appropriate mathematical tools to solve it;

Disciplinary Skills - able to:

B 1	be fluent and accurate in basic numerical skills;
B 2	comprehend fundamental concepts and techniques of calculus, algebra, probability theory and at least one additional main mathematical subject;

B 3	take notes, write up notes, plan revision, and learn independently;
B 4	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;
B 5	manage time and work cooperatively with fellow students;

Attributes:

C 1	acquire complex knowledge and apply it rigorously;
C 2	connect information and ideas within their field of study;
C 3	use writing for learning, reflection, and communication;
C 4	adapt their understanding to new and unfamiliar settings;
C 5	acquire new learning skills in a range of ways, both individually and collaboratively;
C 6	use quantitative data confidently and competently;
C 7	acquire transferable key skills to help with career goals and continuing education;
C 8	develop effective spoken English and presentation skills;
C 9	use information for evidence-based decision-making and creative thinking;

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 25% 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 structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

For degree-awarding purposes (in order to deal with special cases like changes of programme) students will be allowed to choose up to 30 credits of off diet modules in any year (with School approval). At the end of year 2, students have the opportunity to spend a year studying abroad.

(Modules carry 15 credits except where stated otherwise.)

Year 1

Semester A

Two compulsory modules:

MTH4000 Programming in Python I

MTH4213 Numbers, Sets and Functions

Semester B

Two compulsory modules:

MTH4104 Introduction to Algebra

MTH4215 Vectors and Matrices

Semester A & B

Two compulsory modules:

MTH4300 Introduction to Analysis with Calculus (30 credits)

MTH4500 Probability & Statistics (30 credits)

Year 2

Semester A

Three compulsory modules:

MTH5112 Linear Algebra I

MTH5123 Differential Equations

MTH5129 Probability and Statistics II

Choose one from:

MTH5104 Convergence and Continuity

MTH5124 Actuarial Mathematics I

Semester B

One compulsory module:

MTH5005 Programming in Python II

Choose three from:

MTH5103 Complex Variables

MTH5105 Differential and Integral Analysis

MTH5115 Linear Optimisation and Game Theory

MTH5120 Statistical Modelling I

Semesters A and B

One compulsory module:

MTH5205 Professional Skills for Mathematicians (0 credits)

In years 3 and 4, students must choose one of two pathways: Pure or Statistics.

Year 3

Semester A

Pure pathway

Choose four from:

MTH6107 Chaos and Fractals(*)

MTH6131 Number Theory

MTH6138 Third Year Project

MTH6140 Linear Algebra II

MTH6141 Random Processes

MTH6151 Partial Differential Equations

Statistics pathway

Choose four from:

MTH6101 Introduction to Machine Learning

MTH6102 Bayesian Statistical Methods

MTH6138 Third Year Project

MTH6141 Random Processes

MTH6151 Partial Differential Equations

MTH6154 Financial Mathematics I

Semester B

Pure pathway

Choose four from:

MTH6105 Algorithmic Graph Theory

MTH6108 Coding Theory(**)

MTH6110 Communicating and Teaching Maths

MTH6127 Metric Spaces and Topology(***)

MTH6138 Third Year Project

MTH6142 Complex Networks

MTH6150 Numerical Computing with C and C++

Statistics pathway

Choose four from:

MTH6110 Communicating and Teaching Maths

MTH6113 Mathematical Tools for Asset Management

MTH6138 Third Year Project

MTH6139 Time Series

MTH6142 Complex Networks

MTH6150 Numerical Computing with C and C++

MTH6155 Financial Mathematics II

Year 4

Semesters A and B

One compulsory module:

MTH717U MSci project (30 credits)

Semester A

Pure pathway

Choose three from:

MTH7122U Group Theory
MTH727U Chaos and Fractals(*)
MTH786U Machine Learning with Python
MTH739U Topics in Scientific Computing
SPA7027U Differential Geometry in Theoretical Physics

Statistics pathway

Choose three from:

MTH7021U Applied Statistical Modelling
MTH786U Machine Learning with Python
MTH739U Topics in Scientific Computing
MTH7025U Survival Models

Semester B

Pure pathway

Choose three from:

MTH7126U Coding Theory(**)
MTH7123U Metric Spaces and Topology(***)
MTH7125U Ring Theory
MTH750U Graphs and Networks
MTH784U Optimisation

Statistics pathway:

Choose three from:

MTH793U Advanced Machine Learning
MTH791U Computational Statistics with R
MTH741U Digital and Real Asset Analytics
MTH750U Graphs and Networks
MTH784U Optimisation

(*) Students may not take both MTH6107 and MTH727U.

(**) Students may not take both MTH6108 and MTH7126U.

(***) Students may not take both MTH6127 and MTH7123U.

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Programming in Python I	MTH4000	15	4	Compulsory	1	Semester 1
Number, Sets and Functions	MTH4213	15	4	Compulsory	1	Semester 1
Introduction to Algebra	MTH4104	15	4	Compulsory	1	Semester 2

Programme Title: MSci Mathematics;MSci Mathematics with Year Abroad

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Vectors and Matrices	MTH4215	15	4	Compulsory	1	Semester 2
Introduction to Analysis with Calculus	MTH4300	30	4	Compulsory	1	Semesters 1 & 2
Probability & Statistics	MTH4500	30	4	Compulsory	1	Semesters 1 & 2

Academic Year of Study FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Linear Algebra I	MTH5112	15	5	Compulsory	2	Semester 1
Differential Equations	MTH5123	15	5	Compulsory	2	Semester 1
Convergence and Continuity	MTH5104	15	5	Elective	2	Semester 1
Professional Skills for Mathematicians	MTH5205	0	5	Compulsory	2	Semesters 1 & 2
Probability and Statistics II	MTH5129	15	5	Compulsory	2	Semester 1
Programming in Python II	MTH5005	15	5	Compulsory	2	Semester 2
Complex Variables	MTH5103	15	5	Elective	2	Semester 2
Differential and Integral Analysis	MTH5105	15	5	Elective	2	Semester 2
Linear Optimisation and Game Theory	MTH5115	15	5	Elective	2	Semester 2
Statistical Modelling I	MTH5120	15	5	Elective	2	Semester 2
Actuarial Mathematics I	MTH5124	15	5	Elective	2	Semester 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Chaos and Fractals (Pure pathway)	MTH6107	15	6	Elective	3	Semester 1
Number Theory (Pure pathway)	MTH6131	15	6	Elective	3	Semester 1
Third Year Project (Pure and Statistics pathways)	MTH6138	15	6	Elective	3	Semester 1 or 2
Linear Algebra II (Pure pathway)	MTH6140	15	6	Elective	3	Semester 1
Random Processes (Pure and Statistics pathways)	MTH6141	15	6	Elective	3	Semester 1
Partial Differential Equations (Pure and Statistics pathways)	MTH6151	15	6	Elective	3	Semester 1
Introduction to Machine Learning (Statistics pathway)	MTH6101	15	6	Elective	3	Semester 1
Bayesian Statistical Methods (Statistics pathway)	MTH6102	15	6	Elective	3	Semester 1
Financial Mathematics I (Statistics pathway)	MTH6154	15	6	Elective	3	Semester 1
Algorithmic Graph Theory (Pure pathway)	MTH6105	15	6	Elective	3	Semester 2
Coding Theory (Pure pathway)	MTH6108	15	6	Elective	3	Semester 2
Communicating and Teaching Mathematics (Pure and Statistics pathways)	MTH6110	15	6	Elective	3	Semester 2
Metric Spaces and Topology (Pure pathway)	MTH6127	15	6	Elective	3	Semester 2
Complex Networks (Pure and Statistics pathways)	MTH6142	15	6	Elective	3	Semester 2
Numerical Computing with C and C++ (Pure and Statistics pathways)	MTH6150	15	6	Elective	3	Semester 2
Mathematical Tools for Asset Management (Statistics pathway)	MTH6113	15	6	Elective	3	Semester 2
Time Series (Statistics pathway)	MTH6139	15	6	Elective	3	Semester 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Financial Mathematics II (Statistics pathway)	MTH6155	15	6	Elective	3	Semester 2

Academic Year of Study FT - Year 4

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
MSci project	MTH717U	30	7	Compulsory	4	Semesters 1 & 2
Group Theory (Pure pathway)	MTH7122U	15	7	Elective	4	Semester 1
Chaos and Fractals (Pure pathway)	MTH727U	15	7	Elective	4	Semester 1
Machine Learning with Python (Pure and Statistics pathways)	MTH786U	15	7	Elective	4	Semester 1
Topics in Scientific Computing (Pure and Statistics pathways)	MTH739U	15	7	Elective	4	Semester 1
Differential Geometry in Theoretical Physics (Pure pathway)	SPA7027U	15	7	Elective	4	Semester 1
Applied Statistical Modelling (Statistics pathway)	MTH7021U	15	7	Elective	4	Semester 1
Survival Models (Statistics pathway)	MTH7025U	15	7	Elective	4	Semester 1
Coding Theory (Pure pathway)	MTH7126U	15	7	Elective	4	Semester 2
Metric Spaces and Topology (Pure pathway)	MTH7123U	15	7	Elective	4	Semester 2
Ring Theory (Pure pathway)	MTH7125U	15	7	Elective	4	Semester 2
Graphs and Networks (Pure and Statistics pathways)	MTH750U	15	7	Elective	4	Semester 2
Optimisation (Pure and Statistics pathways)	MTH784U	15	7	Elective	4	Semester 2
Advanced Machine Learning (Statistics pathway)	MTH793U	15	7	Elective	4	Semester 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Computational Statistics with R (Statistics pathway)	MTH791U	15	7	Elective	4	Semester 2
Digital and Real Asset Analytics (Statistics pathway)	MTH741U	15	7	Elective	4	Semester 2

What are the entry requirements?

For UK applicants, we require 3 GCE A-levels at AAA—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? How do we listen to and act on your feedback?

The programme is over seen by a Programme Director with overall oversight of the programme.

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

The quality of individual modules is monitored by DoE and DDoE, 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 School operates an Education Committee which advises the School's Director of Education 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 for approval 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.

All Schools operate a periodic Programme Review of their taught undergraduate and postgraduate provision. This is a continuous process of reflection and action planning which is owned by those responsible for programme delivery; the main document of reference for this process is the Student Experience Action Plan (SEAP) which is the summary of the School's work throughout the year to monitor academic standards and to improve the student experience. 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 the NSS and module evaluations.

Every 5-6 years the School undergoes a Periodic Review of its teaching provision, by a panel consisting of experts external to the School. The process is organised at a School-level basis with the Director of Education 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.

The Student Voice Committee provides a formal means of communication and discussion between the School and its students. The committee consists of student representatives from each year of the programmes, together with appropriate representation from staff within the School. It is designed to respond to both the general needs of students, and subject specific concerns, as well as act as a forum for discussing programme and module developments. Student Voice Committees meet regularly throughout the year.

The Director of Education and Deputy Director of Education both attend the Student Voice Committee and the School's Education Committee and ensure that student feedback is fed into the review of modules and programmes. Student views are also incorporated in the Committee's work in other ways, such as through the National Student Survey (NSS) and student module evaluations.

What academic support is available?

Each student is allocated a personal academic advisor, 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 Education Services Team. Each programme is assigned a Programme Director and all teaching is overseen by the Education Committee, which includes the Programme Directors and is chaired by the Director of Education. Programmes are monitored continuously and reviewed every few years by the Education Committee.

How inclusive is the programme for all students, including those with disabilities?

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.

Programme-specific rules and facts

Links with employers, placement opportunities and transferable skills

Recent graduates have gone into a wide variety of jobs. Some went into positions in the financial sector ranging from actuarial and accountancy trainees with banks such as Lloyds TSB to a financial analyst with AIG. Teacher training was an option that was taken up by a number of our graduates, as was further study: around one third of our graduates go on to complete a Masters or PhD degree. High-level numeracy is one of the most sought-after skills in the workplace and many opportunities are open to a mathematical sciences graduate. During this degree programme students learn how to analyse and solve problems, apply mathematical modelling, communicate their ideas and theories effectively, and work independently and manage their own time. Students learn to apply mathematical techniques to situations across the sciences and other areas such as finance. These skills are highly desirable to employers ranging from business and finance to the chemicals and materials industries.

Programme Specification Approval

Person completing Programme Specification:

Matthew Fayers

Person responsible for management of programme:

Pedro Vergel

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

24 Feb 2025

**Date Programme Specification approved by Taught
Programmes Board:**