Birkbeck
UNIVERSITY OF LONDON

Programme Specification

1	**Awarding body**	University of London
2	**Teaching Institution**	**Birkbeck College**
3	**Programme Title(s)**	**BSc Mathematics** **BSc Mathematics with Foundation Year**
4	**Programme Code(s)**	UUBSMTHT_C (3-year full-time) UBSMTHMT_C (4-year part-time) UUBFMTHT_C (4-year full-time with Foundation Year) UBFMTHMT_C (6-year part-time with Foundation year)
5	**UCAS code**	G100/G101 (with Foundation Year)
6	**Home Department**	Economics, Mathematics and Statistics
7	**Exit Award(s)**	Certificate of Continuing Education Certificate of Higher Education Diploma of Higher Education
8	**Duration of Study** (number of years)	3 years full-time/4 years part time
9	**Mode of Study**	FT ✓ PT ✓ DL
10	**Level of Award (FHEQ)**	6
11	**Other teaching depts or institution**	N/A
12	**Professional, Statutory Regulatory Body(PSRB) details**	N/A
13	**QAA Benchmark Statement**	Mathematics, Statistics and Operational Research

14	**Programme Rationale & Aims**
	The BSc Mathematics aims to provide a broad education in mathematics, and the application of the subject to problems in the natural and social sciences. The programme covers both theoretical aspects of the subject as well as methods and modelling techniques. Students develop an understanding of a range of mathematical skills together with the abstract background to enhance their understanding of this material.

The programme aims to develop the student's ability and confidence to learn independently through regular coursework. In their final year students follow the module *Problems in Mathematics* as part of their programme, which develops an appreciation of the cultural and historical aspects of the subject, enhances the ability to communicate effectively about the subject, and further develops independent learning.

In line with the College's mission to make high quality education available to students who are not able for whatever reason to study during the day, the programme is delivered by evening, face-to-face study and is offered both in part-time and full-time modes.

Foundation Year |

In the Foundation Year the emphasis is on gaining experience and skill in the fundamental study skills and mathematical techniques needed for the study of mathematics at university level. These will then be developed and extended as the degree continues, so that students develop an understanding of a range of mathematical skills together with the abstract background to enhance their understanding of this material.

On successful completion of the foundation year modules, students then follow the same programme as the BSc Mathematics, or can transfer across to foundation year routes of the BSc Mathematics with Statistics, BSc Mathematics with Accounting, BSc Mathematics with Economics or BSc Mathematics with Management.

| 15 | **Entry Criteria** |

BSc Mathematics: UCAS tariff: 112-128 points. (A-levels: BBC-ABB, including grade B in mathematics.) The UCAS tariff score is applicable to students who have recently studied a qualification that has a UCAS tariff equivalence.

Mature students who do not have formal mathematics qualifications at A level or equivalent, may still be considered for entry to the programme if they pass an entrance test. Students whose first language is not English may be asked to give evidence of proficiency at English, and/or attend a pre-sessional English language course.

BSc Mathematics with Foundation Year: UCAS tariff: 64. The UCAS tariff score is applicable to students who have recently studied a qualification that has a UCAS tariff equivalence. A-levels: An A-level, or equivalent, in mathematics is desirable, but not essential. Applicants without such a qualification will need to pass an entrance test.

| 16 | **Learning Outcomes** |

On successful completion of the BSc Mathematics a student will have attained the following learning outcomes.

Subject Specific
LO1 Knowledge and understanding of, and the ability to use, mathematical and/or statistical techniques.

LO2 Knowledge and understanding of a range of results in mathematics.

LO3 Appreciation of the need for proof in mathematics, and the ability to follow and construct mathematical arguments.

LO4 Awareness of the use of mathematics and/or statistics to model problems in the natural and social sciences, and the ability to formulate such problems using appropriate notation.

LO5 Understand the importance of assumptions and have an awareness of where they are used and the possible consequences of their violation.

LO6 Ability to present, analyse and interpret data.

LO7 Appreciation of the power of generalization and abstraction in the development of mathematical theories.

LO8 Knowledge and understanding of the processes and limitations of mathematical approximation and computational mathematics.

LO9 Knowledge and understanding of a range of modelling techniques, their conditions and limitations, and the need to validate and revise models.

LO10 A deeper knowledge of some particular areas of mathematics.

LO11 Ability to use a modern mathematical and/or statistical computer package with a programming facility, together with knowledge of other suitable packages.

L012 Appreciation of the historical and cultural aspects of mathematics.

Intellectual
LO13 Ability to comprehend conceptual and abstract material.

LO14 Develop a logical and systematic approach to problem solving.

Practical
LO15 Ability to use a range of software packages including word processing and spreadsheets.

LO16 Problem-solving skills, including the ability to assess problems logically and to approach them analytically.

LO17 Highly developed quantitative skills

LO18 Ability to transfer knowledge and expertise from one context to another.

Personal and Social
LO19 Ability to learn independently using a variety of media.

LO20 Ability to work independently with patience and persistence.

LO21 Time-management and organizational skills.

LO22 General IT skills, including word processing and spreadsheets.

LO23 Good communication skills, including the ability to write coherently.

LO24 Ability to complete a sustained and substantial task.

LO25 Ability to complete work in a limited time period.

Learning outcomes for Foundation Year:
Successful completion of the Foundation Year will enable students to:

1. Demonstrate knowledge of the underlying concepts and principles associated with mathematics and its applications and be able to interpret these within the context of their studies
2. Apply mathematical concepts to the solution of a diverse range of problems
3. Analyse and interpret data provided in exercises
4. Extract, evaluate and accurately document relevant information from mathematical texts and on-line sources

5. Present and interpret qualitative and quantitative data, develop lines of mathematical argument in accordance with basic theories and concepts
6. Communicate the result of their study/work accurately and reliably in writing with structured and coherent arguments and using academic conventions
7. Use standard mathematical symbols and representation of data confidently and correctly
8. Demonstrate mathematical literacy
9. Work independently and in a group including in a laboratory setting
10. Manage their time and work to deadlines
11. Demonstrate qualities and transferable skills which would be necessary for employment requiring the exercise of some personal responsibility

| 17 | **Learning, teaching and assessment methods** |

Teaching and Learning Methods for Foundation Year:

A range of teaching methods including lectures, problem-solving, group work, open-book in-class tests and exercises are used.

On-line learning materials are provided, and students are encouraged to make use of the discussion boards.

All modules emphasise the development of active and scholarly engagement with the curriculum.

Home study is encouraged by question and problem sheets, and by a programme of home assignments.

The assessment strategy is designed to support the students' development with a balance of coursework, in class tests and examination changing as the programme progresses.

Teaching and Learning Methods for the Degree:

Most teaching sessions are lectures or occasionally computing sessions. Lectures present both theory and worked examples. Computing sessions use either spreadsheets or a modern statistical or mathematical software package, and enable students to learn about these packages and allow them to develop a greater understanding of the course material. The computing sessions are usually self-paced and informal.

Detailed course notes, problems and worked solutions are provided to accompany lectures on each course. This facilitates the independent study necessary to understand and assimilate the material. Regular coursework and a variety of assessment methods are also designed to be formative and promote learning.

The *Problems in Mathematics* module enables students to develop their knowledge of some areas of mathematics of cultural and historical significance, through self-study, supported by occasional lectures.

Individual tutorials are provided as required and are an integral part of the teaching provision. Students may also consult staff by email and telephone.

The methods of assessment used are:

- Unseen 3 hour examinations in May/June.
- Assessed assignments.
- Essays.

For most modules 80% of the assessment comes from unseen examinations in May/June. This allows time for students to assimilate the material and develop a thorough understanding of the course curriculum. The 20% contribution from coursework enables students to get practice in tackling and solving problems independently, without the time pressure of examinations, and gives staff an opportunity to give relevant feedback.

The range of assessments, and the type of questions and problems set within examinations and assignments are structured to balance theory and practice, to address the individual learning outcomes and to discriminate between different levels of achievement. However the assessment strategy recognizes that students may exhibit very different aptitudes and abilities in different aspects of the course and in different forms of assessment. This is particularly relevant to Birkbeck students who vary considerably in terms of academic background, prior work experience, current career and future career plans. The assessment strategy is therefore designed to: (i) ensure a good coverage of the curriculum and address the range of learning outcomes, (ii) perform an on-going formative function via the theoretical and practical assignments associated with all course modules; (iii) give all students the opportunity to demonstrate their strengths and show what they can do well.

Both the external and the second internal examiner normally scrutinize all examination papers before they are finalized. All examination papers are double marked. Coursework is marked by the first examiner and moderated by the second internal examiner. All marks are moderated by the External Examiner, who is invited to comment on the suitability of the assessment methods, criteria and procedures. These comments influence any changes that are recommended at the BSc review meeting.

18	**Programme Description**
	BSc Mathematics with Foundation Year: This programme, which has an integrated Foundation Year, is designed to build students' confidence and capabilities in the study of mathematics. The Foundation Year provides a sound framework and body of knowledge for understanding the ideas and methodology of mathematics and its applications. The main degree provides a broad education in mathematics – and the application of mathematics to the natural and social sciences. The programme covers both theoretical aspects of the subject as well as methods and modelling techniques. *Foundation Year and Progression:* The Foundation Year provides a sound framework and body of knowledge for understanding the ideas and methodology of mathematics, statistics and their applications. Following successful completion of the foundation year, students either follow the same

modules as years 1 to 3 of the full-time BSc Mathematics (described below), or transfer to Year 1 of one of the following programmes (with foundation year) to complete their degree.

- BSc Mathematics with Statistics with Foundation Year
- BSc Mathematics with Accounting with Foundation Year
- BSc Mathematics with Economics with Foundation Year
- BSc Mathematics with Management with Foundation Year

Note that years 1 to 3 (1-4 part-time) of the "with Foundation Year" programme routes are exactly the same as the corresponding BSc programmes, and students successfully completing the "with foundation" route receive the same degree title awards as those on the corresponding BSc programmes.

BSc Mathematics:

The first two years of the programme consist mainly of core and compulsory modules. These modules cover the body of knowledge that every student is expected to know as a key part of university level study in this area. As part of the programme, students may opt to study up to 30 credits at level 4 and 5 in a different subject area, such as management, economics or accounting.

At level 4 (corresponding to Year 1 Full-Time) there are 90 credits of core modules. At level 5 there are 60 credits of compulsory modules, and 60 credits of options. At level 6 just 30 credits are compulsory (the Problems in Mathematics module), with 90 credits of options so that students can choose modules most relevant to their interests.

19	Programme Structure			

Full-Time programme (3 years)

Year 1

Level	Module Code	Module Title	Credits	Status*
4	EMMS096S4	Calculus 1	30	Core
4	EMMS097S4	Algebra 1	30	Core
4	BUEM096S4	Numbers, Proofs and Counting	30	Core
4		Indicative option list below	30	Option

Year 2

Level	Module Code	Module Title	Credits	Status*
5	BUEM001S5	Calculus 2	30	Compulsory
5	EMMS098S5	Probability and Statistics	30	Compulsory
5		Indicative option list below	30	Option
5/6		Indicative option list below (students may opt to do at most ONE level 6 maths option with approval of programme director)	30	Option

Year 3

Level	Module Code	Module Title	Credits	Status*
6	BUEM009S6	Problems in Mathematics	30	Compulsory
6/5		Indicative option list below (if students do a level 6 option in year 2, then they do 30 credits level 5 in year 3 to compensate)	30	Option
6		Indicative option list below	30	Option
6		Indicative option list below	30	Option

Part Time programme (4 years)

Year 1

Level	Module Code	Module Title	Credits	Status*
4	EMMS096S4	Calculus 1	30	Core
4	EMMS097S4	Algebra 1	30	Core
4	BUEM096S4	Numbers, Proofs and Counting	30	Core

Year 2

Level	Module Code	Module Title	Credits	Status*
4		Indicative option list below	30	Option
5	BUEM001S5	Calculus 2	30	Compulsory
5	EMMS098S5	Probability and Statistics	30	Compulsory

Year 3

Level	Module Code	Module Title	Credits	Status*
5		Indicative option list below	30	Option
5		Indicative option list below	30	Option
6		Indicative option list below	30	Option

Year 4

Level	Module Code	Module Title	Credits	Status*
6	BUEM009S6	Problems in Mathematics	30	Compulsory
6		Indicative option list below	30	Option
6		Indicative option list below	30	Option

Full-Time programme with Foundation Year (4 years)

Year 0

Level	Module Code	Module Title	Credits	Status*
3	CASE002S3	Fundamentals of Study: Learning through the Global City	30	Core
3	BUEM095S3	IT and Data Skills	30	Core
3	BUEM093S3	Essential Mathematics	30	Core
3	BUEM094S3	Pure Mathematics	30	Core

Year 1

Level	Module Code	Module Title	Credits	Status*
4	EMMS096S4	Calculus 1	30	Core
4	EMMS097S4	Algebra 1	30	Core
4	BUEM096S4	Numbers, Proofs and Counting	30	Core
4		Indicative options list below	30	Option

Year 2

Level	Module Code	Module Title	Credits	Status*
5	BUEM001S5	Calculus 2	30	Compulsory
5	EMMS098S5	Probability and Statistics	30	Compulsory
5		Indicative options list below	30	Option
5/6		Indicative options list below (students may opt to do at most ONE level 6 maths option with approval of programme director)	30	Option

Year 3

Level	Module Code	Module Title	Credits	*Status
6	BUEM009S6	Problems in Mathematics	30	compulsory
6/5	option	Indicative list below (if they do a level 6 option in year 2, then they do 30 credits level 5 in year 3 to compensate)	30	option
6	option	Indicative list below	30	option
6	option	Indicative list below	30	option

Part Time programme with Foundation Year (6 years)

Year 0a

Level	Module Code	Module Title	Credits	Status*
3	CASE002S3	Fundamentals of Study: Learning through the Global City	30	Core
3	BUEM093S3	Essential Mathematics	30	Core

Year 0b

Level	Module Code	Module Title	Credits	Status*
3	BUEM094S3	Pure Mathematics	30	Core
3	BUEM095S3	IT and Data Skills	30	Core

Year 1

Level	Module Code	Module Title	Credits	Status*
4	EMMS096S4	Calculus 1	30	Core
4	EMMS097S4	Algebra 1	30	Core
4	BUEM096S4	Numbers, Proofs and Counting	30	Core

Year 2

Level	Module Code	Module Title	Credits	Status*
4		Indicative options list below	30	Option
5	BUEM001S5	Calculus 2	30	Compulsory
5	EMMS098S5	Probability and Statistics	30	Compulsory

Year 3

Level	Module Code	Module Title	Credits	Status*
5		Indicative options list below	30	Option
5		Indicative options list below	30	Option
6		Indicative options list below	30	Option

Year 4

Level	Module Code	Module Title	Credits	Status*
6	BUEM009S6	Problems in Mathematics	30	compulsory
6		Indicative options list below	30	option
6		Indicative options list below	30	option

Optional modules (indicative list)

Level	Module Code	Module Title	Credits	Status*
4	BUEM099S4	Explorations in Mathematics	30	option
4	-	At most 30 credits of modules in another subject area	30	option
5	BUEM100S5	Number Theory and Cryptography	30	option
5	BUEM101S5	Algebra 2	30	option
5	-	At most 30 credits of modules in another subject area	30	option
6	BUEM102S6	Algebra 3	30	option
6	BUEM103S6	Analysis	30	option
6	BUEM104S6	Ordinary Differential Equations	30	option
6	BUEM105S6	Finite Mathematics	30	option
6	BUEM106S6	Approximation: Theory and Methods	30	option
6	BUEM003S6	Statistics: Theory and Practice	30	option

Status*

CORE – Module must be taken and passed by student

COMPULSORY – Module must be taken, mark can be reviewed at sub-exam board

OPTIONAL – Student can choose to take this module

20	**Additional Programme Information**
	Students gaining the Certificate in Higher Education in Mathematics from Birkbeck may transfer all 120 credits from that programme, meaning they can go straight to year 2 of the BSc Mathematics. Students gaining the Diploma in Higher Education in Mathematics from Birkbeck may transfer all 240 credits from that programme, meaning they can go straight to year 3 of the BSc Mathematics. Students taking both *Probability and Statistics* and *Statistics: Theory and Practice* will gain the exit award *BSc Mathematics with Statistics.*

21	**Programme Director**	Dr Andrew Bowler (BSc Mathematics) Dan McVeah (BSc Mathematics with Foundation Year)
22	**Start Date** (term/year)	Autumn 2008
23	**Date approved by TQEC**	Spring 2008
24	**Date approved by Academic Board**	Summer 2008
25	**Date(s) updated/amended**	February 2020