Year of entry: 2022/23

Programme Specification

1	**Awarding body**	University of London						
2	**Teaching Institution**	**Birkbeck College**						
3	**Programme Title(s)**	**MSc Mathematical Finance**						
4	**Programme Code(s)**	TMSMATFI_C						
5	**UCAS code**	N/A						
6	**Home Department**	Economics, Mathematics and Statistics						
7	**Exit Award(s)**	PG Certificate; PG Diploma						
8	**Duration of Study** (number of years)	One year (Full Time) or two years (Part-time)						
9	**Mode of Study**	FT	**x**	PT	**x**	DL		
10	**Level of Award (FHEQ)**	7						
11	**Other teaching depts or institution**	N/A						
12	**Professional, Statutory Regulatory Body(PSRB) details**	N/A						
13	**QAA Benchmark Statement**	N/A						

14	**Programme Rationale & Aims**
	The MSc Mathematical Finance will provide training in advanced mathematical and financial techniques, enabling graduates to seek employment in financial institutions, including financial regulatory institutions. The range of topics covered will include stochastic processes, statistics, numerical mathematics, computational methods, and applications of these techniques to financial markets. Students will acquire expertise in the areas of option pricing, risk management, Matlab and C++, and numerical analysis. Distinctive features of this programme are evening study, available in part-time version over two years or full time over one year.

15	**Entry Criteria**
	The normal requirement is at least a second- class degree from a UK university (or an overseas qualification of an equivalent standard obtained from a university, or educational institution of university rank, following a programme of study extending over a period of no less than three years) in a quantitative subject such as mathematics, physics, statistics, economics or engineering. Alternatively, a merit or higher in Graduate Diploma in Economics/Mathematics/Statistics would be suitable for entry. Work experience will be taken into account in assessing applicants. Graduates from other disciplines such as computer science will be accepted if their degree contains a major quantitative element. In some circumstances students are admitted with a first degree that is less than the 2.1 standard, provided that their subsequent work experience and/or education and training is deemed to have brought them to an equivalent standard.

16	**Learning Outcomes**
	In general, at the end of the programme students should have a comprehensive overview of the fields of mathematical finance. They should be able to apply quantitative tools to solve

	problems in this field and conduct independent applied research in the form of a dissertation. **Subject Specific learning outcomes:** Students will gain a comprehensive overview of mathematical finance. They will be able to apply quantitative tools to solve problems in this field and conduct independent applied research in the form of a dissertation. Subject-specific skills will include L01: stochastic integration and stochastic differential equations to financial valuation problems L02: The use of numerical methods for pricing securities and commodities L03: Techniques for measuring risk and estimating suitable levels of capital for financial institutions L04: The appropriate structuring and implementation of computer programmes for financial applications **Intellectual:** L05: Ability to understand advanced material on the behaviour of prices in financial markets. L06: Ability to formulate valuation problems. L07: The ability to conceive and write a computer programmes for use in a financial context. **Practical:** L08: How to solve valuation problems, both theoretically and numerically? L09: How to analyse and quantify financial risks by means of statistical techniques. **Personal and Social:** L10: The ability to develop knowledge independently by study of a range of sources. L11: The ability to plan, execute and complete an in-depth study of a particular topic within a specified period of time and to write a polished and convincing summary of the results obtained.

17	**Learning, teaching and assessment methods**
	The majority of teaching is delivered in the form of the traditional lectures, problem-solving sessions and computer lab sessions. • Traditional 'chalk-and-talk' lectures give the lecturers the opportunity to clarify each step of a complex derivation, react instantly to clarification queries, and vary the pace of the lecture where appropriate. • Problems-solving sessions are based on pre-assigned problems, enabling students to first attempt the problems independently and then to confirm or discover the solution collectively through classroom discussion. • Computer lab sessions allow students to tackle how computational methods can be used to tackle problems and to solve problems numerically. Most courses make use of substantial handouts designed to help students digest the material developed in lectures. Specific directions to textbooks, academic papers or extensive lecture notes help the students obtain a clear idea of the material. Private study is a crucial ingredient. The programme requires students to produce independent dissertation which tests their ability to develop analytically tight arguments, carry out empirical research, and their written communication skills. **Assessment:** The following methods of assessment are used:

- Unseen examinations, typically of two hour or three hour duration
- Assessed coursework, in the form of class tests or take-home assignment
- Dissertation

For each module the bulk (generally around 80%) of the assessment comes from unseen examinations. These are typically held on an annual cycle in January or June. The contribution (around 20%) from the coursework ensures that, throughout the year, students get practice, and are given feedback, in tackling and solving problems independently without time pressure of examinations. The range of questions and problems set within examinations and coursework are structured to balance theory and practice, to address the individual learning outcomes and to discriminate between different levels of achievement. Our assessment strategy also takes into consideration that students can exhibit a wide range of aptitudes and abilities in different aspects of the course. Thus the assessment is designed to ensure a good coverage of the curriculum so that all students have the opportunity to demonstrate their strengths.

The modules are assessed on a scale on which 50% represents a pass mark, 60-69% a merit and 70% or above yields a distinction. The dissertation is assessed similarly as Fail, Pass, Merit or Distinction. Examination papers and dissertations are marked independently by two markers who then compare marks and produce agreed final marks. All marks are moderated by an external examiner who is also asked to comment on the suitability of the assessment.

18 **Programme Description**

MSc Mathematical Finance offers advanced training in quantitative skills used in modern financial institutions, including most notably valuation of securities, and measurement and management of portfolio risks. Training is provided in programming, numerical methods and statistics, and you will be given grounding in pricing and risk management techniques. A key feature is the emphasis on computational methods and implementation of the pricing and risk management techniques learnt. Students will complete modules in programming, numerical methods and financial statistics, and many topics are illustrated by computer examples. Students complete 180 credits taking a compulsory 30-credit module in Mathematical and Numerical Methods, and choose option modules to a total of 120 credits, and complete a 30-credit dissertation.

19 **Programme Structure**

Full-Time programme – 1 year

Year 1

Level	Module Code	Module Title	Credits	Status*
7	EMMS011S7	Mathematical and Numerical Methods	30	Compulsory
7		Options to a total of 120 credits	120	Optional
7	BUEM029S7	Dissertation MSc Finance	30	Compulsory

Year of entry: 2022/23

Part Time programme – 2 years				
Year 1: 90 credits total				
Level	**Module Code**	**Module Title**	**Credits**	**Status***
7	EMMS011S7	Mathematical and Numerical Methods	30	Compulsory
7		Options to a total of 60 credits	60	Optional
Year 2: 90 credits total				
Level	**Module Code**	**Module Title**	**Credits**	**Status***
7		Options to a total of 60 credits	60	Optional
7	BUEM029S7	Dissertation MSc Finance	30	Compulsory
Indicative options				
Level	**Module Code**	**Module Title**	**Credits**	**Status***
6	BUEM027S6	Quantitative Techniques	30	Optional
7	BUEM033H7	Forecasting Economic and Financial Time Series	15	Optional
7	BUEM053H7	Market Risk Management	15	Optional
7	BUEM051H7	Credit Risk Management	15	Optional
7	BUEM052H7	Mathematics of Financial Derivatives	15	Optional
7	BUEM086H7	Derivatives across Asset Classes: Valuation and Hedging	15	Optional
7	EMEC026S7	Econometrics	15	Optional
7	BUEM077S7	Econometrics of Financial Markets	30	Optional
7	BUEM043H7	Corporate Finance	15	Optional
7		Any other approved mathematics or finance options at Level 7	15/30	Optional

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	**Programme Director**	Dr Brad Baxter
21	**Start Date** ***(term/year)***	Autumn 2017
22	**Date approved by TQEC**	Autumn 2016 (Chair's Action)
23	**Date approved by Academic Board**	Spring 2017
24	**Date(s) updated/amended**	December 2016