Year of entry: 2022/23

Programme Specification

1	**Awarding body**	University of London					
2	**Teaching Institution**	**Birkbeck College**					
3	**Programme Title(s)**	**MSc Applied Statistics and Financial Modelling**					
4	**Programme Code(s)**	TMSASFMO_C					
5	**UCAS code**	N/A					
6	**Home Department**	Economics, Mathematics and Statistics					
7	**Exit Award(s)**	PG Dip in Applied Statistics and Financial Modelling PG Dip in Applied Statistics PG Cert in Applied Statistics					
8	**Duration of Study** (number of years)	1 (FT), 2 (PT)					
9	**Mode of Study**	FT	**X**	PT	**X**	DL	
10	**Level of Award (FHEQ)**	7					
11	**Other teaching depts or institution**	None					
12	**Professional, Statutory Regulatory Body(PSRB) details**	Normally accredited by the Royal Statistical Society – re-accreditation sought on an annual basis.					
13	**QAA Benchmark Statement**						

14	**Programme Rationale & Aims**
	The MSc in Applied Statistics and Financial Modelling [MASFM] aims to provide an advanced and up-to-date course in applied statistics with modules that allow specialization in stochastic processes and its applications to finance, along with other options available in the broad areas of operational research, applied statistics and computer-intensive statistical methods. The core modules, which are in common with the MSc Applied Statistics (and associated pathways), is designed to provide a broad education and training in statistics at postgraduate level and provides a stopping off point, in the form of the Postgraduate Certificate in Applied Statistics, for those who do not need more advanced or more specialized training. Students should develop a strong theoretical knowledge and understanding of the relevant principles and techniques, as well as the ability to apply these appropriately in practice and to interpret the results in the context of the application. Practical work in the computing sessions enhances the student's practical statistical competence and gives experience in the use of sophisticated, high-level statistical computer packages with advanced programming facilities for modelling and analysis. The course aims to develop the student's ability and confidence to learn independently new techniques and new specialized branches of statistics, as well as stochastic processes as applied to the world of finance. The optional and compulsory modules enable students to orient the programme towards their particular interests and career objectives. In addition the project gives experience in carrying out a sustained, independent investigation and giving, both orally and in writing, a well-organized, clear exposition of the problem, the analysis and the conclusions in terms that can be understood by a non-specialist.

	Distinctive Features: The programme is delivered by part or full-time, evening, face-to-face study. The part time MSc programmes are currently accredited by the Royal Statistical Society for Graduate Statistician Status, the academic requirement for subsequent professional qualification as a Chartered Statistician. Accreditation will be sought for full time modes (along with re-accreditation of part time) in due course.

15	**Entry Criteria**
	A second-class honours degree (2:2) or above, with mathematics or statistics as a main subject. Other degrees or professional qualifications may also be acceptable, such as the Birkbeck Graduate Certificate in Statistics or the Graduate Diploma of the Royal Statistical Society.

16	**Learning Outcomes**
	Subject Specific: • LO1 Substantial knowledge and understanding of the principles and theory of statistical inference, probability, random variables and their distributions, and random processes. • LO2 Substantial knowledge and understanding of the principles and theory of experimental and sample survey design and analysis. • LO3 Substantial knowledge and understanding of how principles and theory are applied to the statistical and stochastic modelling of a wide variety of problems in different application areas, to • the design of experimental and observational studies, to the analysis of data from such studies (which may include multivariate and time series data), and to the interpretation of the results. • LO4 Knowledge and understanding of advanced stochastic modelling techniques along with the ability and experience to apply these in the area of Quantitative Finance. • LO5 The ability to abstract the essentials of a practical problem and formulate an appropriate statistical or mathematical model in a way that facilitates analysis of the problem and interpretation of the results. • LO6 An understanding of the importance of assumptions, awareness of where they are used and of the possible consequences of their violation. • LO7 The ability to carry out independently a sustained investigation requiring an analysis using mathematical, statistical or operational research methods, and to communicate the results clearly, both in writing and orally, in a way that would be understandable to a non-specialist. • LO8 Substantial knowledge and experience of at least 1 high-level modern statistical package with a programming capability, together with a knowledge of other relevant mathematical and statistical software. **Intellectual:** • LO9 An analytical and systematic approach to problem solving. • LO10 The ability to select or acquire data relevant to a problem and summarise, analyse, present and interpret the data appropriately in the context of the problem. • LO11 The ability to understand advanced, abstract material.

	Practical: • LO12 The ability to select and use a variety of general, statistical and mathematical software as appropriate, and to incorporate graphical and numerical output into a word processed report. **Personal and Social:** • LO13 Communication and presentation skills tailored to a designated audience. • LO14 Ability to transfer knowledge from one context to another. • LO15 The ability to learn independently by study of a range of sources including learned journals. • LO16 The ability to work independently and complete a sustained and substantial task. • LO17 Self motivation, time management and organization. For the ***Postgraduate Certificate in Applied Statistics*** the student will have demonstrated the skills specified in the learning outcomes for the modules "Probability and Stochastic Modelling" and "Statistical Analysis" and the learning outcomes LO1, LO2, LO3, LO8, LO9, LO12, LO13, LO14, LO15, LO16, LO17, LO18 and LO21 given above.

17	**Learning, teaching and assessment methods**
	Most scheduled teaching sessions are either lectures, or practical computing sessions held in a workstation room and making use of modern statistical and mathematical software. Lectures present theory, worked problems and example applications to the class as a whole. Workstation sessions allow students to gain practical experience for themselves in the analysis and modelling of data. They are therefore self-paced and very informal. Students work individually using detailed guidance notes and discuss their results and any difficulties amongst themselves and with the members of staff present to provide tutorial assistance. Detailed course notes, problems and worked solutions are provided to accompany lectures on each module. This facilitates the independent study necessary to fully understand and assimilate the material. Regular coursework and a variety of assessment methods are also designed to be formative and promote learning. Students are not normally permitted to progress to Year 2 modules before both Year 1 core modules have been passed. This ensures that students do not start to specialise before they have mastered the core material (which constitutes an essential pre-requisite to the Year 2 material). The *Project*, which is a core module, is a substantial investigation giving students an extended opportunity to combine their theoretical knowledge with practical skills of data analysis, statistical modelling and computing. Correspondingly, the optional *Individually Prescribed Reading Course* allows students to learn for themselves some specialized branch of statistics, operational research or financial modelling, and present what they have learnt in writing in the form of an extended essay summarizing, evaluating and criticizing the material studied. Individual supervision is provided for both the core *Project* and optional *Individually Prescribed Reading Course.*

18	**Programme Description**
	Part-time: **Year 1: 2 core 30 credit modules** EMMS018S7 Probability and Stochastic Modelling

EMMS016S7 Statistical Analysis

Year 2: 120 credits total

i) EMMS026D7 Project Applied Statistics **(core, 60 credits)**

ii) One out of *either*

EMMS024H7 Continuous Time Stochastic Processes **(compulsory, 15 credits)**

or

EMMS011S7 Mathematical and Numerical Methods **(compulsory, 30 credits)**.

iii) EMMS004H7 Stochastic Processes and Financial Applications **(compulsory, 15 credits)**

iv) In addition students choose modules up to the value of 30 credits if they have selected EMMS024H7 (or else up to the value of 15 credits if they selected EMMS011S7) from the indicative second year option list given in Section 19 (availability depending on timetable, demand and available staff expertise) - or from further modules approved by the Programme Director.

Full-time:

As above, except all modules taught in year 1.

19 **Programme Structure**

Full-Time programme – 1 year

Year 1

Level	Module Code	Module Title	Credits	Status*
7	EMMS018S7	Probability and stochastic modelling	30	Core
7	EMMS016S7	Statistical analysis	30	Core
7	EMMS026D7	Project	60	Core
7	BUEM080H7	Bayesian Methods	15	Optional
7	EMMS019H7	Linear and Nonlinear Optimization	15	Optional
7	EMMS023H7	Computational Statistics	15	Optional
7	EMMS021H7	Analysis of Dependent Data	15	Optional
7	EMMS022H7	Statistical Learning	15	Optional
7	EMMS017H7	Stochastic Systems and Simulation	15	Optional
		or		
7	BUEM006H7	Stochastic Models and Forecasting	15	
7	EMMS024H7	Continuous Time Stochastic Processes	15	Compulsory
		or		
7	EMMS011S7	Mathematical and Numerical Methods	30	
7	EMMS004H7	Stochastic Processes and Financial Applications	15	Compulsory
7	EMMS028H7	Individually Prescribed Reading Course	15	Optional

Part Time programme

Year 1

Level	Module Code	Module Title	Credits	Status*
7	EMMS018S7	Probability and stochastic modelling	30	Core
7	EMMS016S7	Statistical analysis	30	Core

The above two modules constitute PG Cert. in Applied Statistics. Normally both must be passed before a student is admitted to anyYear 2 modules

Year of entry: 2022/23

Year 2				
Level	**Module Code**	**Module Title**	**Credits**	**Status***
7	EMMS026D7	Project	60	Core
7	BUEM080H7	Bayesian Methods	15	Optional
7	EMMS019H7	Linear and Nonlinear Optimization	15	Optional
7	EMMS023H7	Computational Statistics	15	Optional
7	EMMS021H7	Analysis of Dependent Data	15	Optional
7	EMMS022H7	Statistical Learning	15	Optional
7 7	EMMS017H7 **Or** BUEM006H7	Stochastic Systems and Simulation Stochastic Models and Forecasting	15 15	Optional
7 7	EMMS024H7 **or** EMMS011S7	Continuous Time Stochastic Processes Mathematical and Numerical Methods	15 30	Compulsory
7	EMMS004H7	Stochastic Processes and Financial Applications	15	Compulsory
7	EMMS028H7	Individually Prescribed Reading Course	15	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	**Additional Programme Information**
	A compulsory module which is taken in relation to one of the award titles other than MSc Applied Statistics that has been failed may instead be considered for compensated credit toward the award of MSc Applied Statistics if warranted by the overall performance on the programme.

21	**Programme Director**	Dr Richard Pymar
22	**Start Date** ***(term/year)***	Prior to 2008/09
23	**Date approved by TQEC**	Prior to 2008/09
24	**Date approved by Academic Board**	Prior to 2008/09
25	**Date(s) updated/amended**	September 2019 (for 2020/21)