

Programme Specification

1	Awarding body	University of London				
2	Teaching Institution	Birkbeck College				
3	Programme Title(s)	MSc Applied Statistics				
4	Programme Code(s)	TMSSTAPP_C				
5	UCAS code	N/A				
6	Home Department	Economics, Mathematics and Statistics				
7	Exit Award(s)	MSc Applied Statistics/MSc Applied Statistics and Computational Data Analytics/MSc Applied Statistics and Operational Research (Referred to as MAS/MASCDA/MASOR respectively in the later sections.) 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	N/A				
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	Mathematics, Statistics and Operational Research				

14	Programme Rationale & Aims
	<p>The MSc Applied Statistics programmes aims to provide an advanced and up-to-date course in applied statistics, with option streams that allow specialization, for example in operational research or modern computer-intensive statistical methods. The core modules are 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. Overall, the MSc Applied Statistics, with its range of named awards, is designed to meet the changing educational and training needs of adults in employment in a wide variety of applied areas. The courses cover the theory and application of modern statistical and mathematical modelling techniques, and the analytic and computational tools, required to solve applied problems in industry, the public services, scientific research and commerce. 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 programme aims to develop the student's ability and confidence to learn independently new techniques and new specialized branches of statistics, operational research and computational statistical methodology. A choice of optional and/or compulsory modules is provided to enable</p>

	<p>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.</p> <p>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.</p>
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15	<p>Entry Criteria</p> <p>A second-class honours degree (2:2) or above, with mathematics or statistics as a main subject..</p> <p>Other equivalent qualifications may be accepted, for example the Graduate Diploma of the Royal Statistical Society. Applicants who do not fully satisfy the entrance requirements, but who have a degree or equivalent qualification, and some knowledge of mathematics and statistics, may be admitted to the one-year part-time Graduate Certificate in Statistics. This is a particularly successful access route onto the MSc programmes. The examination at the end of the qualifying course consists of two three-hour papers, one in theoretical and practical statistics, the other in mathematics for statisticians (particularly advanced calculus, linear algebra and matrix theory). The level required for entry to the MSc Applied Statistics programme is Merit (roughly equivalent to upper second class honours degree standard). In some rare circumstances students are admitted with a first degree at less than second class honours level, provided that their subsequent work experience and/or education and training is deemed to have brought them to an equivalent standard - and provided that they perform well in an entrance test in mathematics and statistics and have positive academic references. A special case has to be made and appropriate approval from the relevant parts of College obtained for each such admission.</p>
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16	<p>Learning Outcomes</p> <p>Subject Specific:</p> <ul style="list-style-type: none"> • 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 the mathematical theory underlying the main classes of constrained optimization problems, the most important solution methods, and the practical contexts in which such problems may arise. (MASOR)
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- LO5 Knowledge and understanding of the theory underlying core stochastic models in the context of optimization and decision problems in industry, business and science. The ability to use the theory in specific applications to determine and optimize appropriate performance measures. (MASOR)
- LO7 Knowledge and understanding of computationally intensive statistical methodology and the ability to apply this in the context of data with either a large number of variable and/or a large sample size. (MASCDA)
- LO8 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.
- LO9 An understanding of the importance of assumptions, awareness of where they are used and of the possible consequences of their violation.
- LO10 A deeper knowledge of some specialist areas of statistics and/or operational research and/or computationally intensive statistical methodology, and/or other cognate disciplines.
- LO11 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.
- LO12 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:

- LO13 An analytical and systematic approach to problem solving.
- LO14 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.
- LO15 The ability to understand advanced, abstract material.

Practical:

- LO16 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:

- LO17 Communication and presentation skills tailored to a designated audience.
- LO18 Ability to transfer knowledge from one context to another.
- LO19 The ability to learn independently by study of a range of sources including learned journals.
- LO20 The ability to work independently and complete a sustained and substantial task.
- LO21 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
	<p>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.</p> <p>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.</p> <p>Some option modules can be delivered in independent learning mode as an alternative to face to face. Students are then encouraged to submit solutions to all unassessed coursework, as well as the assessed coursework, to enable them to receive tutorial feedback as they work through the material, and to enhance the relevance of the scheduled question and answer/problem solving sessions.</p> <p>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 computational statistical methods, 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.</p> <p>Individual and small group tutorials are provided as required and are an integral part of the teaching provision. Students also consult staff by email.</p>
18	Programme Description
	<p>Part-time</p> <p>All Awards</p> <p>Year 1: 2 core 30 credit modules</p> <p>EMMS018S7 Probability and Stochastic Modelling</p> <p>EMMS016S7 Statistical Analysis</p> <p>Year 2:</p> <p>EMMS026D7 Project Applied Statistics (core, 60 credits)</p> <p>In addition students choose modules to the value of 60 credits from the indicative option list given in Section 19 (availability depending on timetable, demand and available staff expertise) - or from further modules approved by the Programme Director.</p> <p>MSc Applied Statistics and Computational Data Analytics</p> <p>EMMS023H7 Computational Statistics (compulsory)</p> <p>BUEM080H7 Bayesian Methods (compulsory)</p>

<p>Plus two other 15-credit optional modules from list in Section 19, or as approved by Programme Director.</p> <p>MSc Applied Statistics and Operational Research</p> <p>EMMS019H7 Linear and Nonlinear Optimization (compulsory)</p> <p>plus</p> <p>EMMS017H7 Stochastic Systems and Simulation</p> <p>or</p> <p>BUEM006H7 Stochastic Models and Forecasting</p> <p>(one of these compulsory)</p> <p>Plus two other 15-credit optional modules from list in Section 19, or as approved by Programme Director.</p> <p>Full-time</p> <p>As above, except all modules taught in year 1.</p>

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	Compulsory for MAS/CDMA; optional for MAS/MASOR
7	EMMS019H7	Linear and Nonlinear Optimization	15	Compulsory for MASOR; optional for MAS/MAS/CDMA
7	EMMS023H7	Computational Statistics	15	Compulsory for MAS/CDMA; optional for MAS/MASOR
7	EMMS021H7	Analysis of Dependent Data	15	Optional
7	EMMS022H7	Statistical Learning	15	Optional
7	EMMS017H7	Stochastic Systems and Simulation	15	Compulsory for MASOR; optional for MAS/MAS/CDMA
7	BUEM006H7	Stochastic Models and Forecasting	15	
7	EMMS028H7	Individually Prescribed Reading Course	15	Optional

Part-Time programme – 2 years				
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 any Year 2 modules				
Year 2				
Level	Module Code	Module Title	Credits	Status*
7	EMMS026D7	Project	60	Core
7	BUEM080H7	Bayesian Methods	15	Compulsory for MAS/CDMA; optional for MAS/MASOR
7	EMMS019H7	Linear and Nonlinear Optimization	15	Compulsory for MASOR; optional for MAS/MAS/CDMA
7	EMMS023H7	Computational Statistics	15	Compulsory for MAS/CDMA; optional for MAS/MASOR
7	EMMS021H7	Analysis of Dependent Data	15	Optional
7	EMMS022H7	Statistical Learning	15	Optional
7	EMMS017H7	Stochastic Systems and Simulation	15	Compulsory for MASOR; optional for MAS/MAS/CDMA
7	BUEM006H7	Stochastic Models and Forecasting	15	
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 credit as a 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 (<i>term/year</i>)	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)