



1. Programme Title(s) and Code(s):

<i>Programme Title</i>	<i>UCAS Code</i>	<i>GU Code</i>
MSci in Statistics	G400	G302-2207

2. Academic Session:

2018-19

3. SCQF Level (see [Scottish Credit and Qualifications Framework Levels](#)):

11

4. Credits:

600

5. Entrance Requirements:

Please refer to the current undergraduate prospectus at:
<http://www.gla.ac.uk/undergraduate/prospectus/>

6. ATAS Certificate Requirement (see [Academic Technology Approval Scheme](#)):

ATAS Certificate not required

7. Attendance Type:

Full Time

8. Programme Aims:

Statistics is a scientific discipline that is concerned with the drawing of objective conclusions from investigations where outcomes are subject to uncertainty or variability. In Statistics, mathematical methods are developed and applied to guide the design of investigations, the collection and handling of numerical data, the analysis and modelling of data, and the interpretation of the results. Statistics has applications in almost every academic

¹ This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each course can be found in course handbooks and other programme documentation and online at www.gla.ac.uk/

The accuracy of the information in this document is reviewed periodically by the University and may be checked by the Quality Assurance Agency for Higher Education.

discipline and many areas of everyday life.

This degree programme aims:

- to provide students with a sound grounding in the principles and theory of Statistics
- to give students the opportunity to develop practical skills in the collection, handling, analysis and modelling of data
- to develop in students the ability to apply their knowledge and practical skills to solve problems amenable to statistical analysis, no matter the subject area in which these problems arise
- to enable students to enhance their transferable and inter-personal skills, particularly in computer applications and programming, oral and written communication, and problem solving
- to provide students with experience as a statistical consultant (primarily through an extended data-analysis project)
- to provide students with experience of conducting statistical research (primarily through a final-year, research project)
- to prepare students to undertake research in Statistics, for employment in a wide variety of contexts where statistical skills are valued, and for engagement in lifelong learning

9. Intended Learning Outcomes of Programme:

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas.

Knowledge and Understanding

On completion of the programme, students will be able to

- demonstrate knowledge of the fundamental concepts, principles, theories and methods of probability and statistics
- build on a comprehensive knowledge of traditional approaches to statistical analysis and modelling in order to evaluate modern ideas, such as applied Bayesian methods, bootstrapping and object oriented statistical computing
- demonstrate awareness of links between different statistical concepts and methods
- apply statistical methods to analyse and model data collected from research in a wide variety of disciplines and hence demonstrate an appreciation of the importance of statistics in those disciplines
- undertake statistical research

Skills and Other Attributes

Subject-specific/practical skills

On completion of the programme, students will be able to

- implement statistical methods in real contexts, obtaining arithmetically correct results, using scientific calculators in simple cases and statistical software packages for more complex problems
- interpret graphical and numerical information and the results of statistical analyses in a valid manner and with reference to the substantive problem being investigated
- program a range of statistical applications, when required
- present the results of a statistical analysis in clear oral and written reports
- work as part of a team, in order to complete a statistical investigation
- recognise the important statistical aspects of a proposed investigation and define the problems to be solved in statistical terms
- evaluate critically the statistical methods used in a particular context, recognising both their strengths and limitations

Intellectual skills

On completion of the programme, students will be able to

- construct appropriate designs for experiments and observational studies

- select and apply appropriate statistical methods
- apply statistical methodology to help solve problems in other disciplines
- interpret the results of a statistical analysis correctly
- plan and carry out a statistical investigation independently
- evaluate published statistical research critically

Transferable/key skills

On completion of the programme, students will be able to

- solve problems using a logical and analytical approach
- adopt a structured approach to problem solving
- assess graphical and numerical information critically
- make efficient use of computers for acquiring, analysing and presenting information
- structure and communicate ideas effectively both orally and in writing;
- manage time and meet deadlines
- use ICT facilities, including word-processing, spreadsheet and database packages as well as statistical software
- work independently, but with the support of an experienced supervisor available as required

10. Typical Learning and Teaching Approaches:

- lectures
- guided reading of books and articles
- tutorials
- problem sheets
- computer-based, data-analysis sessions
- practical reports
- extended data-analysis and research projects
- programming classes
- programming tasks
- teamwork tasks

11. Typical Assessment Methods:

- unseen examinations (formative and summative)
- practical reports
- reports on data-analysis and research projects
- unseen programming examination
- teamwork tasks
- oral presentations on group work tasks and on projects (formative only)

12. Programme Structure and Features:

Structure

Course Title	Course Code	Credits	Core	Optional	Semester(s) taught
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Year 1

Statistics 1Y: Probability and Statistical Methods	STATS1002	20		(1)	1
Statistics 1Z: Statistics in Action	STATS1003	20		(1)	2
Mathematics 1R or Mathematics 1X	MATHS1001 MATHS1003	20	x		1
Mathematics 1S or Mathematics 1Y	MATHS1002 MATHS1004	20	x		2
Mathematics Skills Test	MATHS1006	0	x		1 and 2
<i>Other courses</i>		<i>40 to 80</i>			<i>1 and 2</i>

Year 2

Statistics 2R: Probability	STATS2002	10	x		1
Statistics 2S: Statistical Methods	STATS2003	10	x		1
Mathematics 2A: Multivariate Calculus	MATHS2001	10	x		1
Mathematics 2B: Linear Algebra	MATHS2004	10	x		1
Statistics 2X: Probability II	STATS2005	10	x		2
Statistics 2Y: Regression Models	STATS2006	10	x		2
Mathematics 2D: Topics in Linear Algebra and Calculus	MATHS2006	10	x		2
Mathematics 2E: Introduction to Real Analysis	MATHS2007	10		(2)	2
<i>Other courses</i>		<i>40-50</i>			<i>1 and 2</i>

Year 3

Course Title	Course Code	Credits	Core	Optional	Semester(s) taught
Inference 3	STATS4012	10	x		1
Linear Models 3	STATS4015	10	x		1
Introduction to R Programming	STATS4044	10	x		1
Biostatistics	STATS4006	10	x		1
Multivariate Methods	STATS4046	10	x		1
<u>Stochastic Processes</u>	<u>STATS4024</u>	10	x		1
Generalised Linear Models	STATS4043	10	x		2
Time Series	STATS4037	10	x		2
Design of Experiments	STATS4008	10	x		2
Data Analysis	STATS4052	10	x		2
Professional Skills	STATS4048	10	x		2
Bayesian Statistics	STATS4041	10	x		2

Year 4

Course Title	Course Code	Credits	Core	Optional	Semester(s) taught
Principles of Probability and Statistics	STATS4047	10	(3)		1
Advanced Bayesian Methods	STATS4038	10	(3)		1

Data Management and Analytics using SAS	STATS4064	10	(3)		1
Flexible Regression	STATS4040	10	(3)		1
Linear Mixed Models	STATS4045	10	(3)		1
Advanced Data Analysis	STATS4039	10	(3)		1
Big Data Analytics	STATS4042	10	(3)		2
Environmental Statistics	STATS4009	10	(3)		2
Financial Statistics	STATS4010	10	(3)		2
Statistics Project	STATS4050 P	30	x		2

Year 5

Course Title	Course Code	Credits	Core	Optional	Semester(s) taught
Statistics research project	STATS5063P	80	x		1 and 2
Statistical genetics (Level M)	STATS5011	10	x		2
Spatial statistics (Level M)	STATS5012	10	x		2
Functional data analysis (Level M)	STATS5056	10	x		2
Machine Learning (Level M)	COMPSCI5014	10	x		1

- (1) Students are strongly encouraged to take Statistics 1Y and Statistics 1Z in first year.
- (2) Students are strongly encouraged to take Mathematics 2E in second year.
- (3) Students will substitute one 10cp course in each semester of fourth year (chosen in consultation with the Year 4 Class Co-ordinator) with the equivalent Level M course.

Regulations

Subject-specific

In order to progress to second year, students need to pass the Mathematics Skills Test and require a minimum of D3 in Mathematics 1R or 1X and Mathematics 1S or 1Y.

In order to progress to third year of the programme, students need to obtain, at first attempt,

- a minimum of C3 in Statistics 2R, Statistics 2S, Statistics 2X and Statistics 2Y with a GPA of 15 and
- a minimum of D3 in Mathematics 2A, Mathematics 2B and Mathematics 2D with a GPA of 15.

In order to progress to fourth year students need to obtain a GPA of 15 across all third year courses. Students that do not meet this requirement may be qualified for Level 4 of the equivalent BSc(Hons) programme.

In order to progress to fifth year students need to obtain a GPA of 15 across all fourth year courses. Students that do not meet this requirement may be qualified to graduate with the equivalent BSc (Hons) degree.

Generic

This programme will be governed by the relevant regulations published in the University Calendar. These regulations include the requirements in relation to:

- (a) Award of the degree
- (b) Progress
- (c) Early exit awards
- (d) Entry to Honours (For undergraduate programmes, where appropriate)

<http://www.gla.ac.uk/services/senateoffice/calendar/>

13. Programme Accredited By:

Royal Statistical Society.

14. Location(s):

Glasgow

15. College:

College of Science and Engineering

16. Lead School/Institute:

Mathematics and Statistics [REG30500000]

17. Is this programme collaborative with another institution:

No

18. Awarding Institution(s):

University of Glasgow

19. Teaching Institution(s):

20. Language of Instruction:

English

21. Language of Assessment:

English

22. Relevant QAA Subject Benchmark Statements (see [Quality Assurance Agency for Higher Education](#)) and Other External or Internal Reference Points:

QAA Subject Benchmark – Mathematics, Statistics and Operational Research
(<http://www.qaa.ac.uk/academicinfrastructure/benchmark/honours/mathematics.pdf>)

Royal Statistical Society – Detailed Criteria for Accreditation
(<http://www.rss.org.uk/site/cms/contentCategoryView.asp?category=135>)

23. Additional Relevant Information (if applicable):

Support for students is provided by the Postgraduate/Undergraduate Adviser(s) of Studies supported by University resources such LEADS (www.gla.ac.uk/myglasgow/leads/), Counselling & Psychological Services (www.gla.ac.uk/services/counselling/), the Disability Service (www.gla.ac.uk/services/studentdisability/) and the Careers Service (www.gla.ac.uk/services/careers/).

The University of Glasgow provides a learning environment in which emphasis is placed on applying statistical knowledge to solve real-life problems. The School of Mathematics and Statistics here incorporates one of the largest groups of academic statisticians in the United Kingdom and is well known for the diversity of its research interests, from theoretical developments to multi-disciplinary applications. A wide range of teaching methods is

used: computer-based data analysis and project work as well as traditional lectures and tutorials. Our graduates are very successful in finding employment in many different sectors, particularly finance, medical research, the pharmaceutical industry and the Government Statistical Service. Many graduates of the MSci degree programmes choose to continue their studies to PhD level.

IT facilities

Students are expected to carry out a variety of tasks using computers (e.g. the word-processing of reports or essays) and the School of Mathematics and Statistics prefers to keep in contact with students via e-mail. Students in the School enjoy the use of five dedicated computing labs, equipped with almost 200 powerful, modern PC's running a range of word-processing, spreadsheet, database and statistical software. Software purchase schemes organised by the University of Glasgow allow students to obtain personal copies of these items of software, for their own home use, free or at greatly discounted prices.

Student support systems

Support for students is provided by an Undergraduate Adviser of Studies, supported by University resources such as:

- an Effective Learning Adviser in the Student Learning Service (www.gla.ac.uk/services/tls/sls/)
- the Student Counselling and Advisory Service (www.gla.ac.uk/services/counselling/)
- the Student Disability Service (www.gla.ac.uk/services/studentdisability/), and
- the Careers Service (www.gla.ac.uk/services/careers/).

Employability

All new students in the College of Science and Engineering can opt to receive employability training in their first two years at university. The School of Mathematics and Statistics organises a variety of events for its Honours students, focussing on opportunities for employment and further study after graduation. This includes an induction programme in the first week of Third Year.

Feedback from students

Each Statistics class elects at least one of its members to represent it on the appropriate School Staff-Student Committee. This is a forum in which student representatives may obtain further information about administrative matters, raise complaints and suggest improvements to their courses. Two undergraduate student representatives from the Staff-Student Committees are invited to attend meetings of the Statistics Learning and Teaching Committee, where they may comment on any matter under discussion or, indeed, raise matters that they would like to have discussed. Student representation on other University committees and bodies (such as Senate) is the responsibility of the Students' Representative Council (SRC).

24. Online Learning:

No

25. Date of approval:

09/07/2018