



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

| <i>Programme Title</i>                 | <i>UCAS Code</i> | <i>GU Code</i> |
|--|------------------|----------------|
| MSci in Statistics with Work Placement | G305             | G408-2207      |

### 2. Academic Session:

2016-17

### 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

<sup>1</sup> 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](http://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 (through an extended data-analysis project and a work placement year)
- to provide students with experience of conducting statistical research (through a final-year, research project and a work placement year)
- to provide experience of a year's full time employment as a practicing Statistician
- 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 to 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 data analysis in a work environment

Skills and Other Attributes:

By the end of this programme students will be able to:

#### *Subject-specific/practical skills*

- 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*

- 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*

- 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
- carry out data analysis in a work environment, and report on the work done in written and oral form

**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
- work placement projects

**11. Typical Assessment Methods:**

- unseen examinations
- practical reports
- reports on data-analysis and research projects
- unseen programming examination
- teamwork tasks
- oral presentations
- work placement report and presentation

**12. Programme Structure and Features:**

**Structure**

| Course Title | Course Code | Credits | Core | Optional | Semester(s) taught |
|--------------|-------------|---------|------|----------|--------------------|
|--------------|-------------|---------|------|----------|--------------------|

**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<br>MATHS1003 | 20              | x |     | 1              |
| Mathematics 1S or Mathematics 1Y                   | MATHS1002<br>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 (weighted at 40%)**

| 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                  |
| Professional Skills           | STATS4048   | 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                  |
| Stochastic Processes          | STATS4024   | 10      | x    |          | 2                  |
| Bayesian Statistics           | STATS4041   | 10      | x    |          | 2                  |

**Year 4 (weighted at 20%)**

| Course Title                   | Course Code | Credits | Core | Optional | Semester(s) taught |
|--------------------------------|-------------|---------|------|----------|--------------------|
| Statistics Work Placement Year | STATS4061P  | 10      | x    |          | entire year        |

**Year 5 (weighted at 40%)**

| Course Title                                       | Course Code | Credits | Core | Optional | Semester(s) taught |
|--|-------------|---------|------|----------|--------------------|
| Principles of Probability and Statistics (Level M) | STATS5026   | 10      | x    |          | 1                  |
| Advanced Bayesian Methods (Level M)                | STATS5013   | 10      | x    |          | 1                  |
| Data Management and Analytics using SAS (Level M)  | STATSTBC    | 10      | x    |          | 1                  |
| Flexible Regression (Level M)                      | STATS5052   | 10      | x    |          | 1                  |
| Linear Mixed Models (Level M)                      | STATS5054   | 10      | x    |          | 1                  |
| Advanced Data Analysis (Level M)                   | STATS5051   | 10      | x    |          | 1                  |
| Statistics Project WP                              | STATS5055 P | 20      | x    |          | 2                  |
| Big Data Analytics (Level M)                       | STATS5016   | 10      |      | (3)      | 2                  |
| Environmental Statistics (Level M)                 | STATS5031   | 10      |      | (3)      | 2                  |
| Financial Statistics (Level M)                     | STATS5053   | 10      |      | (3)      | 2                  |
| Statistical Genetics                               | STATS5011   | 10      |      | (3)      | 2                  |
| Spatial Statistics                                 | STATS5012   | 10      |      | (3)      | 2                  |
| Functional Data Analysis                           | STATS5056   | 10      |      | (3)      | 2                  |

(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 select 40 credits from this group of optional courses.

**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.

Entry to the work placement year (fourth year) will be competitive and selection for this year will be on the basis of a successful application and interview involving the prospective employer, and will be conditional on students achieving a minimum GPA of 15 in third year. (Students that have been selected for the work placement year but that do not achieve the required GPA in third year will have the option to complete the work placement as a one-year internship that is not part of their degree, provided the employer agrees to this. These students would then return to the 4<sup>th</sup> year of a BSc (Hons) degree). In the event of exceptional circumstances, preventing a student from completing a substantial proportion of the work placement year, the student would return to the 4<sup>th</sup> year of a BSc (Hons) degree and the internship would not form part of their degree.

In order to progress to fifth year students need to obtain a minimum of C3 in the work placement. Students that do not obtain this will return to the 4<sup>th</sup> year of a BSc (Honours) degree.

Alternatively, on the recommendation of the Head of School, the Degree of BSc in a designated subject may be awarded 'with Work Placement' to a candidate who has successfully completed the work placement year of an MSci Degree and is qualified for the award of a BSc designated degree.

**Generic**

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

- Award of the degree
- 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:**

The 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):**

University of Glasgow

**20. Language of Instruction:**

English

**21. Language of Assessment:**

English

**22. Relevant QAA Subject Benchmark Statements (see [Quality Assurance Agency for Higher Education](http://www.qaa.ac.uk/academicinfrastructure/benchmark/honours/mathematics.pdf)) 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 as the Student Learning Service ([www.gla.ac.uk/services/sls/](http://www.gla.ac.uk/services/sls/)), Counselling & Psychological Services ([www.gla.ac.uk/services/counselling/](http://www.gla.ac.uk/services/counselling/)), the Disability Service ([www.gla.ac.uk/services/studentdisability/](http://www.gla.ac.uk/services/studentdisability/)) and the Careers Service ([www.gla.ac.uk/services/careers/](http://www.gla.ac.uk/services/careers/)).

Support for students is provided by the Postgraduate/Undergraduate Adviser(s) of Studies supported by University resources such as the Effective Learning Adviser located in the Student Learning Service ([www.gla.ac.uk/services/tls/sls/](http://www.gla.ac.uk/services/tls/sls/)), the Student Counselling and Advisory Service ([www.gla.ac.uk/services/counselling/](http://www.gla.ac.uk/services/counselling/)), the Student Disability Service ([www.gla.ac.uk/services/studentdisability/](http://www.gla.ac.uk/services/studentdisability/)) and the Careers Service ([www.gla.ac.uk/services/careers/](http://www.gla.ac.uk/services/careers/)).

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|------------------------------|--|
| <b>24. Date of approval:</b> |  |
|------------------------------|--|