

**BSc Statistics**  
**For students entering Part 1 in 2008/9**

**UCAS code: G300**

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	Mathematics, Statistics and Operational Research
Faculty:	Science Faculty
Programme length:	3 years
Date of specification:	01/Sep/2010
Programme Director:	Dr Karen Ayres
Programme Advisor:	Dr Karen Ayres
Board of Studies:	Mathematics/Statistics
Accreditation:	Royal Statistical Society

**Summary of programme aims**

The programme aims to provide a thorough degree-level education in statistics. This is achieved by providing modules which cover the basic principles of summarising, presenting and drawing conclusions from data, as well as those concentrating on statistical inference, modelling and the practical applications of the subject. A distinguishing feature of the programme is that it gives strong emphasis on the practical applications of statistics in a variety of areas, including business, biological sciences, economics and medicine, and emphasises the use of statistical software in data analysis.

**Transferable skills**

During the course of their studies at Reading, all students will be expected to enhance their academic and personal transferable skills in line with the University's Strategy for Learning and Teaching. In following this programme, students will have had the opportunity to develop such skills, in particular relating to communication, interpersonal skills, learning skills, numeracy, self-management, use of IT and problem-solving and will have been encouraged to further develop and enhance the full set of skills through a variety of opportunities available outside their curriculum.

As part of this programme students are expected to have gained experience and show competence in the following transferable skills: IT (word-processing, spreadsheet, database and statistical software), scientific writing, oral presentation, team-working, problem-solving, use of library and internet resources, time-management, and career planning.

**Programme content**

The profile which follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection (the 'selected' modules). Students must choose such additional modules as they wish, in consultation with their programme advisor, to make 120 credits in each Part. The number of credits for each module is shown after its title.

**Part 1 (three terms)**

*Compulsory modules*

<i>Module</i>	<i>Title</i>	<i>Credits</i>	<i>Level</i>
AS1A	Communicating with Statistics	20	C
AS1B	Probability and Statistical Methods	20	C

*Selected modules chosen from the following two options:*

**Option 1:**

AS1C	Mathematical Methods for Statistics	20	C
<i>and modules to the value of 60 credits from:</i>			
SE1TQ5	Commercial Off-the-Shelf Software	20	C
LA1***	Modern Language	20	C
EC104	Economics for Managers	20	C
AP1SB1	Introduction to Management	10	C
AP1EM1	Introduction to Marketing	10	C
EC1F1A	Introductory Microeconomics	20	C

EC1F1B	Introductory Macroeconomics	20	C
MA115	Codes and Code Breaking	20	C
MM1F2	Introductory Financial Accounting	20	C
HC1PHI	Introduction to Public Health	20	C
MM1F10	Student Enterprise	20	C

**Option 2**

MA11B and MA11C	Calculus and Applications	20	C
	Matrices, Vectors and Applications	20	C

and modules to the value of 40 credits from:

SE1TQ5	Commercial Off-the-Shelf Software	20	C
MA11A	Introduction to Analysis	20	C
MA11D	Introduction to Algebra	20	C
LA1***	Modern Language	20	C
EC104	Economics for Managers	20	C
AP1SB1	Introduction to Management	10	C
AP1EM1	Introduction to Marketing	10	C
EC1F1A	Introductory Microeconomics	20	C
EC1F1B	Introductory Macroeconomics	20	C
MA115	Codes and Code Breaking	20	C
MM1F2	Introductory Financial Accounting	20	C
HC1PHI	Introduction to Public Health	20	C
MM1F10	Student Enterprise	20	C

OR any other module(s) of 20 credits

Notes: Not all combinations of options may be available due to timetabling constraints.

**Part 2 (three terms)**

*Compulsory modules*

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
AS2A	Statistical Theory and Methods	20	I
AS2B	Linear Models	20	I
AS2G	Skills for Statisticians	20	I

At least one of

AS2D	Medical Statistics	20	I
AS2F	Study Design and Sampling Methods	20	I
AS2H	Forensic Statistics and Genetics	20	I

AND selected modules to make a total of 120 credits for Part 2 chosen from the following:

MA24A	Analysis	20	I
MA24L	Differential Equations and Fourier Series	20	I
MA2LA	Linear Algebra	10	I
MA2CT	Coding Theory	10	I
MA2VC	Vector Calculus	10	I
MA2NA	Numerical Analysis	10	I
MA24G	Elementary Algebra	20	I
AP2SB1	Business Management	10	I
AP2SB2	Financial Management	10	I
AP2EM1	Marketing Management	10	I
EC203A	Introductory Econometrics I.1	20	I
EC203B	Introductory Econometrics I.2	10	I

MM270	The Practice of Entrepreneurship	20	I
LA1***	Modern Language	20	I
BI2EH4	Introduction to the History and Philosophy of Science	10	I

OR Any other approved module(s) of 20 credits.

### Part 3 (three terms)

#### Compulsory modules

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
AS3A	Advanced Statistical Modelling	20	H
AS3F	Statistics Research Project	40	H

At least one of

AS3C	Analysis of Structured Data	20	H
AS3D	Operational Research Techniques	20	H
AS3G	Study Design and Sampling Methods	20	H

and selected modules to make a total of 120 credits of which at least 100 credits must be at level 6. This may include

AS2D	Medical Statistics	20	I
AS2H	Forensic Statistics and Genetics	20	I
MM270	The Practice of Entrepreneurship	20	I
LA1***	Modern Language	20	C
MA34L	Differential Equations and Fourier Series	20	H
MA3LA	Linear Algebra	10	H
MA3CT	Coding Theory	10	H
MA3VC	Vector Calculus	10	H
MA3NM	Numerical Methods	10	H
MA3SM	Modelling of Soft Matter	10	H
MA3ASP	Applied Stochastic Processes	10	H
MA3MB	Mathematical Biology	10	H
MA3D7	History of Mathematics and its Applications	10	H
MA3W7	Control Systems	10	H
MA3Z7	Number Theory	10	H
MA3DY	Dynamics	10	H
MA3C7	Boundary Value Problems	10	H
AP3EM1	Marketing Strategy	10	H
AP3EM2	Marketing Research Methods	10	H
MM379	Social Enterprise	20	H

### Progression requirements

To gain a threshold performance at Part 1 a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 1, and a mark of at least 30% in individual modules amounting to not less than 100 credits. In order to progress from Part 1 to Part 2, a student shall normally be required to achieve a threshold performance at Part 1 and to obtain an average of at least 40% in the two compulsory Statistics modules taken together, with at least 30% in each of these two modules.

To gain a threshold performance at Part 2 and qualify for the DipHE a student shall normally be required to achieve an overall average of 40% over 120 credits taken in Part 2, and a mark of at least 30% in individual

modules amounting to not less than 100 credits. In order to progress from Part 2 to Part 3, a student shall normally be required to achieve a threshold performance at Part 2.

Part 2 contributes one third of the final assessment and Part 3 the remaining two thirds.

### **Summary of teaching and assessment**

Teaching is organised in modules that typically involve both lectures and practicals. The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbook. The pass mark in each module is 40%. Modules are normally assessed by a mixture of coursework and formal examination, although some are assessed wholly by coursework. The Part 3 project is essentially self-study, supported by a series of tutorials, and is assessed as coursework. Part 2 contributes one third of the final assessment and Part 3 the remaining two thirds.

### **Admission requirements**

Entrants to this programme are normally required to have obtained:

UCAS Tariff: A Level: 280 points including at least grade D in AS Mathematics or grade B in A-level Statistics;  
*or*

International Baccalaureate: 29 points including 5 in Mathematics; *or*

Irish Highers: BBBB, including Mathematics.

**Admissions Tutor:** Dr K L Ayres (Applied Statistics)

### **Support for students and their learning**

University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers, and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses the Student Access to Independent Learning (S@il) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, School Senior Tutors, the Students' Union, the Medical Practice and the Student Services Directorate. The Student Services Directorate is housed in the Carrington Building and includes the Careers Advisory Service, the Disability Advisory Service, Accommodation Advisory Team, Student Financial Support, Counselling and Study Advisors. Student Services has a Helpdesk available for enquiries made in person or online ([www.risisweb.reading.ac.uk](http://www.risisweb.reading.ac.uk)), or by calling the central enquiry number on (0118) 378 5555. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions on everything from accommodation to finance. The Carrington Building is open between 8:30 and 17:30 Monday to Thursday (17:00 Friday and during vacation periods). Further information can be found in the Student website ([www.reading.ac.uk/student](http://www.reading.ac.uk/student)).

Within the providing departments additional support is given through practical classes, and the development of problem-solving skills is assisted by provision of model solutions to exercises. Advice on statistical computing is available from lecturing staff. There is a Programme Adviser to offer advice on the choice of modules within the programme.

### **Career prospects**

In recent years, students who have followed this programme have entered careers as statisticians in the pharmaceutical industry, financial institutions, insurance companies, government and university medical schools. Graduates from this programme will automatically be granted Graduate Statistician status on application to the Royal Statistical Society, provided that at least Second Class Honours have been achieved.

### **Opportunities for study abroad or for placements**

The BSc Applied Statistics programme contains the same academic material as this one and includes a placement year which may be spent abroad.

### **Programme Outcomes**

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

## Knowledge and Understanding

### A. Knowledge and understanding of:

1. The fundamental concepts and techniques of data summary and presentation, statistical inference and linear modelling
2. The application of statistics in a variety of areas
3. A selection of more specialist optional topics
4. The use of statistical software in data analysis.

### Teaching/learning methods and strategies

The knowledge required for the basic topics is delineated in formal lectures supported by problem sets for students to tackle on their own. In Part 1 these are supported by tutorials and practical classes through which students can obtain additional help and feedback on their work.

In the programme students are expected to work on practical problems on their own and seek help when required. Model solutions are provided for problems set.

#### *Assessment*

Most knowledge is tested through a combination of coursework and unseen formal examinations. Dissertations and oral presentations also contribute in other parts of the programme.

## Skills and other attributes

### B. Intellectual skills - *able to*:

1. Think logically  
analyse and solve problems
2. Organise tasks into a structured form
3. Transfer appropriate knowledge and methods from one topic within the subject to another
4. Recognise and use appropriate statistical methods in data analysis
5. Plan, conduct and write a report on an independent project.

### Teaching/learning methods and strategies

Logic is an essential part of the understanding of statistical techniques, and the use of statistical software for data analysis is embedded throughout the programme. The quality of solutions to a problem is substantially determined by the structure of that response; analysis, synthesis, problem solving, integration of theory and application, and knowledge transfer from one topic to another are intrinsic to high-level performance in the programme.

#### *Assessment*

Skills 1-3 are assessed indirectly in most parts of the programme, while 4 contributes to the more successful work. Skills 5 and 6 are assessed in practical work in Parts 2 and 3.

### C. Practical skills - *able to*:

1. Plan, conduct and report on the results of statistical investigations
2. Formulate and solve statistical problems
3. Use statistical software in an effective manner
4. Write and defend a report on a chosen topic.

### Teaching/learning methods and strategies

Lectures, practical work and assignments are designed to enhance skills 1-4.

#### *Assessment*

Skills 1 and 2 are tested both formatively in coursework and summatively in examinations. Skills 3 and 4 are assessed in coursework that involves computer based analysis.

### D. Transferable skills - *able to*:

1. Use IT (word-processing, spreadsheets and statistical software)
2. Communicate scientific ideas
3. Give oral presentations
4. Work effectively as part of a team

### Teaching/learning methods and strategies

The use of IT is embedded throughout the programme, and in the packages Minitab and SAS taught in Parts 1 and 2. Team work and career planning are part of the module *Skills for Statisticians*. Communication skills are enhanced in

5. Use library and internet resources
6. Manage time
7. Plan their career.

Part 2, and are deployed in modules in Parts 2 and 3. Time management is essential for the timely and effective completion of the programme. Library and internet resources are required for certain assignments and contribute to the best performances throughout.

*Assessment*

Skills 1 and 2 are assessed through coursework. Skills 2-5 contribute assessed coursework towards the module *Skills for Statisticians*. Effective use of these skills will enhance performance in later modules.

**Please note - 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 he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.**