

BSc Applied Statistics
For students entering Part 1 in 2009/0

UCAS code: G301

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:	4 years
Date of specification:	13/Apr/2012
Programme Director:	Dr Karen Ayres
Programme Advisor:	Dr Karen Ayres
Board of Studies:	School of Mathematical and Physical Sciences Undergraduate
Accreditation:	Royal Statistical Society This programme will meet the education requirements of Chartered Mathematician designation awarded by the Institute of Mathematics and its Applications, when followed by subsequent training and experience in employment to obtain equivalent competencies to those specified by the Quality Assurance Agency (QAA) for taught masters degrees

Summary of programme aims

The programme aims to provide a thorough degree-level education in statistics with a year spent on placement. 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. The year spent on placement enables students to gain more experience of practical statistics and accordingly make a more informed choice of career.

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 optional 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>Code</i>	<i>Module title</i>	<i>Credits</i>	<i>Level</i>
AS1A	Communicating with Statistics	20	4
AS1B	Probability and Statistical Methods	20	4

Selected modules chosen from the following two options:

Option 1:

AS1C	Mathematical Methods for Statistics	20	4
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and modules to the value of 60 credits from:

SE1TQ5	Commercial Off-the-Shelf Software	20	4
LA1XX1	Modern Language	20	4
EC104	Economics for Managers	20	4
AP1SB1	Introduction to Management	10	4
AP1EM1	Introduction to Marketing	10	4
EC101	Principles of Microeconomics	20	4
EC102	Principles of Macroeconomics	20	4
MA115	Codes and Code Breaking	20	4
MM1F2	Introductory Financial Accounting	20	4
MM1F10	Student Enterprise	20	4

OR any other approved module(s) of 20 credits

Option 2

MA11B	Calculus and Applications	20	4
<i>and</i>			
MA11C	Matrices, Vectors and Applications	20	4

and modules to the value of 40 credits from:

SE1TQ5	Commercial Off-the-Shelf Software	20	4
MA11A	Introduction to Analysis	20	4
MA11D	Introduction to Algebra	20	4
LA1***	Modern Language	20	4
EC104	Economics for Managers	20	4
AP1SB1	Introduction to Management	10	4
AP1EM1	Introduction to Marketing	10	4
EC101	Principles of Microeconomics	20	4
EC102	Principles of Macroeconomics	20	4
MM1F2	Introductory Financial Accounting	20	4
MM1F10	Student Enterprise	20	4

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	5
AS2B	Linear Models	20	5
AS2G	Skills for Statisticians	20	5

At least one of

AS2D	Medical Statistics	20	5
AS2F	Study Design and Sampling Methods	20	5
AS2H	Forensic Statistics and Genetics	20	5

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

MA24A	Analysis	20	5
MA24L	Differential Equations and Fourier Series	20	5
MA2LA	Linear Algebra	10	5
MA2CT	Coding Theory	10	5
MA2VC	Vector Calculus	10	5
MA2NM	Numerical Methods	10	5
MA24G	Elementary Algebra	20	5
AP2SB1	Business Management	10	5
AP2SB2	Financial Management	10	5
AP2EM1	Marketing Management	10	5
EC203A	Introductory Econometrics I.1	20	5
EC203B	Introductory Econometrics I.2	10	5
MM270	The Practice of Entrepreneurship	20	5
LA1XX1	Modern Language	20	4
MT2CC1A	The Science of Climate Change	10	5
BI2EH4	Introduction to the History and Philosophy of Science	10	5

Year abroad/Year away/Additional year (three terms)

Compulsory modules

<i>Mod Code</i>	<i>Module Title</i>	<i>Credits</i>	<i>Level</i>
AS2PY	Placement year	120	5

Between Parts 2 and 3 of the programme, one year will be spent on placement in an appropriate organisation.

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	6
AS3F	Statistics Research Project	40	6

Optional modules

(i) At least 20 credits from:

AS3D	Operational Research Techniques	20	6
ST3MVA	Multivariate Data Analysis	10	6
ST3MSD	Modelling Structured Data	10	6
ST3SM	Sampling Methods	10	6
ST3ED	Experimental Design	10	6
ST3BDA	Bayesian Data Analysis	10	6

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

MA3VC	Vector Calculus	10	6*
MA3NA1	Numerical Analysis I	10	6*
MA3CRY	Cryptography	10	6
AP3EM1	Marketing Strategy	10	6
AP3EM2	Marketing Research Methods	10	6
MM379	Social Enterprise	20	6
ST2EPI	Epidemiology	10	5
ST2CT	Clinical Trials	10	5
ST2GDA	Genetic Data Analysis	10	5
ST2FS	Forensic Statistics	10	5
MM270	Practice of Entrepreneurship	20	5

* Part 3 version of module only available if Part 2 version not already taken

OR any other approved module(s)

Progression requirements

To gain a threshold performance at Part 1 and gain a CertHE 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 and have no module mark below 30% at the first attempt for the modules AS2B and AS2G. Students who pass Part 2 at re-sit are eligible to continue on the Statistics programme if continuation to placement is not agreed.

Satisfactory completion of the placement period (determined on the basis of the student's progress during the year, a report from their employer and the student's own report) is required for continuation into Part 3 of the four-year degree programme in Applied Statistics. Those who do not complete the placement year satisfactorily will be permitted to continue to Part 3 of the three-year degree course in Statistics.

Part 2 contributes one third of the overall 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.

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 is provided by a wide array of services across the University, including: the University Library, the Student Employment, Experience and Careers Centre (SEEC), In-session English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and 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 advisers in the Student Services Centre. The Student Services Centre is housed in the Carrington Building and offers advice on accommodation, careers, disability, finance, and wellbeing. 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 and runs workshops and seminars on a range of topics. For more information see 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, where appropriate. 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 year on placement may be spent abroad. In recent years, students have taken up placements in pharmaceutical companies in Switzerland and Germany.

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. Where appropriate, 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
2. Analyse and solve problems
3. Organise tasks into a structured form
4. Transfer appropriate knowledge and methods from one topic within the subject to another
5. Recognise and use appropriate statistical methods in data analysis
6. 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:

Teaching/learning methods and strategies

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
5. Gain work experience through spending a year on placement.

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

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. Skill 5 is assessed on the basis of progress during the year, and reports from the employer and student.

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 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, in particular the final year project, and contribute to the best performances throughout. The placement year will provide opportunities to develop each of these skills.

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.