BSc Statistics   UCAS Code: G300
For students entering Part 1 in 2003

Awarding Institution:	The University of Reading
Teaching Institution:	The University of Reading
Relevant QAA subject benchmarking group:	Mathematics, Statistics and Operational Research: 22 points

Faculty of Life Sciences   Programme length: 3 years
Date of specification: 14 April 2005
Programme Director: Dr A C Kimber
Programme Adviser: Dr W M Patefield
Board of Studies: Mathematics & Statistics
Accreditation: Programme is accredited by the Royal Statistical Society

Summary of programme aims and learning outcomes

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 drawing conclusions from data, as well as those concentrating on 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, industry, and medicine. (For a full statement of the programme aims and outcomes, see below.)

Transferable skills

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working and use of information technology.

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)

		Credits	Level
Compulsory modules			
AS1A	*Communicating with Statistics*	20	C
AS1B	*Probability and Statistical Methods*	20	C

Selected modules chosen from the following two options:

<u>Option 1</u>

Either	AS1C	*Mathematical Methods for Statistics*	20	C
or	MA111	*Mathematics for Scientists*	20	C

<u>and</u> *modules to the value of 60 credits from:*

CS1TQ2	*Commercial Off-the-Shelf Software*	20	C
MA113	*Logic and Discrete Mathematics*	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

<u>Option 2</u>

	MA11B	*Calculus and Applications*	20	C
<u>and</u>	MA11C	*Matrices, Vectors and Applications*	20	C

<u>and</u> *modules to the value of 40 credits from:*

	CS1TQ2	*Commercial Off-the-Shelf Software*	20	C
	MA11A	*Introduction to Analysis*	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
either	MA11D	*Introduction to Algebra*	20	C
or	MA113	*Logic and Discrete Mathematics*	20	C

Note that Module CS1TQ2 is recommended.

Part 2 (three terms)

		Credits	*Level*

Compulsory modules

AS2A	*Statistical Theory and Methods*	20	I
AS2B	*Linear Models*	20	I
AS2C	*Statistical Consultancy*	20	I

Selected modules to the value of 60 credits chosen from the following:

AS2D	*Medical Statistics*	20	I
AS2E	*Survey Data Management*	20	I
AS2F	*Sampling Methods and Study Design*	20	I
MA24B	*Differential Equations*	20	I
MA24C	*Vector Analysis, Dynamics and Numerical Analysis*	20	I
MA24E	*Linear Algebra and Coding Theory*	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
LA1***	*Modern Language*	20	C

Part 3 (three terms)

		Credits	Level

Compulsory module

AS3A	*Advanced Statistical Modelling*	20	H

Selected modules to the value of at least 60 credits chosen from the following:

AS3C	*Analysis of Structured Data*	20	H
AS3D	*Operational Research Techniques*	20	H
AS3F	*Statistics Research Project*	40	H
AS2F	*Study Design and Sampling Methods*	20	I

and additional modules to give a total of 120 credits of which at least 100 credits must be at Level 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, and have no module marks below 30%.

To gain a threshold performance at Part 2 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. Students who pass Part 2 at resit are eligible to continue on the Statistics programme.

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. Part 2 contributes one third of the overall 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 AS Mathematics; *or*
International Baccalaureate: 29 points including 5 in Mathematics; *or*
Irish Highers: BBBBB, including Mathematics.

Admission Tutor: Dr A C Kimber (Applied Statistics)

Opportunities for study abroad or for placements

The Applied Statistics programme contains the same academic material as this one and includes a placement year.

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, the Careers Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

Within the providing departments additional support is given though 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 the computing staff of the School of Applied Statistics, and copies of software manuals are held in a computing library. There is a Course 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, 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.

Educational aims of the programme

The programme aims to provide a thorough degree-level education in statistics. The programme covers the basic ideas of summarising and presenting data, statistical inference and linear modelling. Strong emphasis is given to practical applications of the subject, and the use of statistical software in data analysis.

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:	**Teaching/learning methods and strategies**
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.	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:	**Teaching/learning methods and strategies**
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.	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
5. use library and internet resources
6. manage time
7. plan their career.

Teaching/learning methods and strategies
The use of IT is embedded throughout the programme, and in the packages Excel, Access, 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 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 expect 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 module and programme handbooks.