Programme Specification

Statistics (2019-20)

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 s/he takes full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of Study	Full-time
Duration in years	1
Accreditation details	None
Final award	Master of Science (MSc)
Name of Award	Statistics
Interim Exit awards	Postgraduate Certificate
	Postgraduate Diploma
FHEQ level of final award	Level 7
UCAS code	
Programme Code	5992
QAA Subject Benchmark or other external reference	Mathematics, Statistics And Operational Research 2007
Programme Lead	Stefanie Biedermann (sb33)
Pathway Lead	

Programme Overview

Brief outline of the programme

An MSc is generally accepted as being highly desirable for starting and developing a career in Statistics, for example as a statistical consultant in Industry, or in the public sector. The MSc in Statistics is also an excellent preparation for embarking on a PhD project in Statistics.

The MSc project is undertaken on completion of the taught component of the programme. It may be in applied or theoretical statistics, and may be related to a real-life problem. It consists of an individual investigation lasting for three months over the summer period, under the supervision of a member of staff. This project enables students to integrate and consolidate skills learned on the programme.

A dissertation on the project work must be submitted soon after the end of the period of study and students are required to complete their work by the middle of September. The award of the degree of MSc in Statistics requires a satisfactory performance in the instructional part of the programme and the project.

Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles.

Learning and teaching

The full-time MSc is completed over a 12-month period. There are two semesters of taught material, which account for 60 ECTS (120 CATS) points, followed by the MSc project in summer, which accounts for 30 ECTS (60 CATS) points. The structure of the programme allows students to select several optional modules from a broad range of topics in Semester 2. There is also a regular seminar series, with speakers from a variety of companies and organisations providing an appreciation of the developments in and use of Statistics in practice. These are complemented by careers talks and presentations on employability skills.

You will be provided with training and education in the theory and methods of Statistics, with an emphasis on practical problems arising in the context of collecting and analysing scientific data.

While studying for your degree, you will develop key transferrable skills, such as written and oral communication, the use of and some programming in Statistical software, time management, and basic research skills.

In summary, the learning and teaching aims of the programme are:

1. To give students knowledge of applied statistical theory and methods at an advanced level;
2. To train students for careers as statisticians;
3. To enable students to develop oral and written communication skills;
4. To give students experience of applications of statistical methods.

Assessment
The taught component of the programme comprises the two semesters of taught material, with assessment via coursework assignments and examinations, which take place at the end of each semester. The MSc programme is completed with a project lasting over 3 months.

By the end of the programme the students should be able to demonstrate:

1. Knowledge and understanding of statistical theory at an advanced level;
2. Knowledge and understanding of the application of statistical methods to practical problems;
3. The ability to carry out and interpret statistical analyses;
4. The ability to write a statistical report on a data analysis topic;
5. The ability to discuss and communicate statistical ideas orally and in written form;
6. The ability to programme in SAS and R to analyse data sets
7. An in-depth knowledge and understanding of an individually researched topic studied as the main project
8. Skill in organising their research work and in presenting their findings by the production of a substantial Dissertation on their chosen project topic.

Special Features of the programme

N/A

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our Disclaimer to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's programme validation process which is described in the University's Quality handbook.

Educational Aims of the Programme

The aims of the programme are to:

1. Train you in the theory and methods of applied statistics to an advanced level;
2. Introduce you to the main statistical techniques, methods and approaches used in a variety of applications;
3. Offer you the opportunity to study more specialised topics selected from a range of options, but within a coherent framework;
4. Develop your statistical skills for problem solving, including modelling using generalised linear modelling techniques;
5. Give you the opportunity of gaining practical experience of applying the problem-solving skills you have learned, by working on an individual research project;
6. Develop key transferable skills, including personal organisation, teamwork, retrieving information, report

writing and oral communication;
7. Prepare you for a career as a statistician

Programme Learning Outcomes

Knowledge and Understanding

On successful completion of this programme you will have knowledge and understanding of:

A1.   Statistical theory at an advanced level,
A2.   The application of statistical methods to practical problems in new or unfamiliar environments,
A3.   Statistical modelling techniques used in the analysis of statistical data,
A4.   The principles of design and analysis of experiments, and advanced applications,
A5.   The techniques used in the analysis of special kinds of data such as survival data or multi-level data,
A6.   The role of statistical inference in the scientific approach,
A7.   The major statistical analysis packages such as sas and r,
A8.   An individual research topic.

Teaching and Learning Methods

Acquisition of knowledge and understanding is through structured exposition based on lectures (1 - 7), computer workshops (2, 3, 7), tutorials (1, 2, 5, 6), group work (2), private study (1 - 8) and a supervised project (8).

Assessment Methods

Every module is assessed, either by an examination or coursework, or a combination of both.   Some of the coursework requires the use of specialist statistical software to solve problems and to build models. Other key requirements are to write reports and to give oral presentations.
Examinations will primarily assess learning outcomes 1, 4, 5 and 6, coursework will primarily assess 2, 3, 4, 5, and 7) and the dissertation will assess 8 (and others, depending on the nature of the topic)

Subject Specific Intellectual and Research Skills

On successful completion of this programme you will be able to:

B1.   Synthesise various statistical techniques to carry out and interpret statistical analyses,
B2.   Design a statistical experiment and conduct the appropriate analysis in new or unfamiliar environments,
B3.   Write a statistical report on a data analysis topic, clearly giving your conclusions and the rationale for your approach,
B4.   Discuss and communicate statistical ideas orally and in written form to specialist and non-specialist Audiences,
B5.   Critically assess the use of particular statistical techniques in practice,
B6.   Synthesise relevant materials acquired from the library and internet,
B7.   Use computer packages to carry out a large variety of statistical data analysis techniques.

Teaching and Learning Methods

The use of statistical models and their interpretation is fundamental to statistical methodology, and this is emphasised throughout the teaching and learning experience. Computer work is an integral part of the programme and enters in several modules in different ways. Specialist computer packages are used with an emphasis on SAS and R, which are the main systems that an applied statistician would be expected to use. These subject specific skills are covered in lectures (1 - 7), computer workshops (1, 2, 3, 5, 7), tutorials (4, 5), seminars (6) and group work (1, 3, 4).

Assessment Methods

Examinations (1, 2, 5), coursework (1 - 7), oral presentations (4, 6), and dissertation (1, 3, 5, 6).

Transferable and Generic Skills

On successful completion of this programme you will be able to:

C1.   Present the results of your work in written reports to specialist and non-specialist audiences,
C2.   Present the results of your work by means of oral presentations,
C3.   Identify and use library and bibliographic resources relevant to your work,
C4.   Manage an individual research project,
C5.   Programme in sas and r to analyse data sets,
C6.   Organise your research work and the presentation of statistical findings by the production of a substantial dissertation on an individual research topic,
C7.   Contribute confidently and appropriately to discussion.

Teaching and Learning Methods

Lectures (1, 2, 3, 5), tutorials (2), seminars (3, 7), workshops (1, 2, 5) and supervised research (4, 6).

Assessment Methods

Coursework (1, 5), oral presentations (2) and dissertation (1, 2, 3, 4, 5, 6).

Programme Structure

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

Pathway

Part I
Typical programme content

Statistics is concerned with decision-making in the face of uncertainty, and lies at the heart of the type of quantitative reasoning necessary for making important advances in the sciences, such as medicine and genetics, and for making important decisions in business and public policy.

You will be provided with training and education in a variety of techniques, methods and approaches of Statistics, and in their application to practical problems arising in different contexts. The programme structure allows you to select options ranging from the more theoretical aspects of Statistics, including a module on research topics, to those which cover material focussed on practical applications of Statistics. This is complemented by modules on research skills, a Statistical seminar series providing insight into the role of Statisticians in various different careers (which also gives opportunities for networking with the speakers) and several presentations on transferrable skills by the University Careers Destination Team. The Statistical seminar series has a module code (MATH6026 and MATH6028 in semesters 1 and 2, respectively), but is not assessed, and thus does not contribute to ECTS/CATS credits.

The dissertation will provide an opportunity to study a topic of your choice more deeply. There will be a broad range of Statistical topics available. Within approximately 4 weeks of starting your dissertation, you will give a short presentation on your results so far, and your planned future work, to your peers and the dissertation supervisors. The dissertation coordinator will provide written feedback on your presentation. This is also a good opportunity to get input from members of staff/your peers on your work at an early stage.

Programme details

The structure of the programme and the modules currently offered are set out below. Of the modules shown against each year of your programme, some are compulsory (i.e. enrolment is automatic) and others are optional. Against each year, you are directed to which modules are compulsory and which are optional. The optional modules listed constitute an indicative list. There will always be choice but the options might vary between years. A list of optional modules will be available to you via the Student Record Self-Service system once you enrol at the University.

A flexible and inclusive approach to learning and teaching will enable any student who meets the entry requirements to access the curriculum and demonstrate achievement of all the intended learning outcomes. This approach should minimise the need for individual alternations to be made for students with particular learning needs.

The programme is normally studied over 12 months full-time. The taught component of the programme consists of 30 study weeks divided into two semesters during which time students study 60 ECTS/120 CATS. Students then undertake a three-month period of
supervised research for a Master's dissertation (six months for part-time students) at a value of 30 ECTS/60 CATS.

Part I Compulsory

Code	Module Title	ECTS	Type
MATH6027	Design of Experiments	7.5	Compulsory
STAT6083	Generalised Linear Models	10	Compulsory
STAT6099	Research Communication Skills	5	Compulsory
MATH6026	Statistical Seminar Series I	0	Compulsory
MATH6028	Statistical Seminar Series II	0	Compulsory
MATH6021	Survival Analysis	3.75	Compulsory

Part I Core

Code	Module Title	ECTS	Type

MATH6171	Likelihood and Bayesian Inference	10	Core
MATH6152	Statistical Computing	5	Core
MATH6031	Statistics Project	30	Core

Part I Option - Rule 1
Please select 37.5 credits from the following list of optional modules:

Code	Module Title	ECTS	Type
MATH6169	Flexible Regression	7.5	Optional
MATH6168	Machine Learning	7.5	Optional
STAT6108	Analysis of Hierarchical (Multilevel & Longitudinal) Data	5	Optional
MATH6151	Clinical Trials	3.75	Optional
STAT6079	Computer Intensive Statistical Methods	5	Optional
MATH6033	Epidemiological Methods	3.75	Optional
MATH6068	Statistical Genetics	3.75	Optional

Part II

Part II Core

Code	Module Title	ECTS	Type
MATH6031	Statistics Project	30	Core

Progression Requirements

The programme follows the University's regulations for *Progression, Determination and Classification of Results : Undergraduate and Integrated Masters Programmes* and *Progression, Determination and Classification of Results: Postgraduate Master's Programmes* as set out in the University Calendar: http://www.calendar.soton.ac.uk/sectionIV/sectIV-index.html

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular Faculty or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia)
- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards

- Career and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV.
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community (18.00-08.00).
- A Centre for Language Study, providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides
- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as Nightline.

Associated with your programme you will be able to access:

· Module co-ordinators support. Module co-ordinators will be available at designated times during the week to discuss issues related to the particular modules you are studying at the time. This will be in addition to class contact time.
· Academic/personal tutor. As soon as you register on this programme, you will be allocated a personal tutor. S/he is a member of the academic team and will be available to discuss general academic issues related to the programme as well as offer advice and support on any personal issues which may affect your studies. In addition, your programme co-ordinator will act as a "senior tutor".
· Module handbooks/outlines. These will be available at the start of each module (often in online format). The handbook includes the aims and learning outcomes of the module, the methods of assessment and relevant background material to the module together with appropriate reading lists.
· Within the Faculty, administrative support is provided by your Student Office which deals with student records and related issues and with queries related to your specific degree programme.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

· Completing student evaluation questionnaires for each module of the programme
· Acting as a student representative on various committees, e.g. Staff: Student Liaison Committees, Faculty Programmes Committee OR providing comments to your student representative to feed back on your behalf.
· Serving as a student representative on Faculty Scrutiny Groups for programme validation
· Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group

The ways in which the quality of your programme is checked, both inside and outside the University, are:

· Regular module and programme reports which are monitored by the Faculty
· Programme validation, normally every five years.
· External examiners, who produce an annual report
· Accreditation by the Royal Statistical Society (currently being applied for)
· A national Research Assessment Exercise (our research activity contributes directly to the quality of your learning experience)
· Institutional Review by the Quality Assurance Agency

Changes to the programme (or individual modules) as a consequence of internal/external checking will be communicated to students in the following ways:

· Student representatives will feed back changes decided in committees. We will in addition announce changes agreed in Staff-Student liaison group on the notice board in the students' study room.
· The annual module report, the latest programme review, and the minutes of Staff-Student liaison group and Mathematics Programmes Board (which also include the External Examiners' reports) are public to students.
· Mathematical Sciences is running a feedback scheme for all MATH coded modules around week 5 of

each semester, where students can write down what they would like to have changed in the module, and the lecturer will explain all changes in the following class.

·   All major changes, which affect the respective current cohort of students, and are not covered by the above, will be communicated by the programme coordinator.

Further details on the University's quality assurance processes are given in the *Quality handbook*.

Career Opportunities

Statistics is a rewarding and often exciting career choice. Statisticians work with the data that are all around us and the opportunities for work are endless. Statistics is concerned with decision-making in the face of uncertainty, and lies at the heart of the type of quantitative reasoning necessary for making important advances in the sciences, such as medicine and genetics, and for making important decisions in business and public policy.

Here is a (by no means complete) list of typical careers for Statistics graduates:

·   Medical Statistician (e.g. at medical schools and universities, or at public sector research organisations)
·   Pharmaceutical Statistician (at pharmaceutical companies or at Contract Research Organisations)
·   Government Statistician (e.g. at the ONS)
·   Financial Statistician (e.g. at a bank or at an investment company)
·   Statistician in insurance
·   Market Research Statistician (e.g. at the market research department of a big company)
·   Study for a PhD in Statistics
·   University Lecturer
·   Environmental Statistician (e.g. in Government environmental organisations)

External Examiner(s) for the programme

Name: Dr Lawrence Pettit - Queen Mary College University of London

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff: Student Liaison Committee in the first instance, and Student representatives on Staff: Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their Personal Academic Tutor in the first instance.

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 s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme also have to pay for:

Additional Costs

Type	Details
Software Licenses	The software required for the programme (SAS, R, Stata) is available on all public workstations on campus, and accessible from your own computer via VPN.
Stationery	You will be expected to provide your own day-to-day stationery items, e.g. pens, pencils, notebooks, etc.). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks	Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Approved Calculators	Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved model is Casio FX-570 This may be purchased from any source and no longer needs to carry the University logo.
Printing and Photocopying Costs	MATH6031 Statistics Project: You will be expected to meet the costs for printing and binding 2 copies of your dissertation. In the majority of cases, coursework such as essays; projects; dissertations is likely to be submitted on line. However, there are some items where it is not possible to submit on line and students will be asked to provide a printed copy. A list of the University printing costs can be found here: http://www.southampton.ac.uk/isolutions/students/printing-for-students.page

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in the University Calendar available at www.calendar.soton.ac.uk.