

Programme Specification: MSC AND DIPLOMA IN APPLIED STATISTICS

1. Awarding institution/body	University of Oxford
2. Teaching institution	University of Oxford
3. Programme accredited by	n/a
4. Final award	(a) MSc in Applied Statistics (b) Diploma in Applied Statistics
5. Programme	(a) MSc in Applied Statistics (b) Diploma in Applied Statistics
6. UCAS code	n/a
7. Relevant subject benchmark statement	Mathematics, Statistics and Operational Research
8. Date of programme specification	June 2008

9. Educational aims of the programme

The aims of the programme are that students:

- learn a wide range of statistical methods, especially modern, computer-intensive methods;
- gain extensive hands-on experience of the analysis of real data from a wide variety of fields;
- develop the skills to interpret and communicate their results.

10. Programme outcomes and means by which they are achieved

Lectures

- Lectures provide information for students to gain a full understanding of the general theory and practice of statistical analysis at an advanced level appropriate for MSc study.
- Lectures are provided on core topics which cover some of the fundamentals of statistics that include statistical inference, statistical methods and multivariate analysis; core material also covers modern computational aspects of statistics through courses in computer-intensive statistics and MCMC and Bayesian statistics.
- A menu of optional topics is provided on further statistical methodology and applications including for example courses in statistical genetics, disease modelling, combinatorial optimisation and actuarial science.
- Non-examinable skills support lectures are provided on statistical computing, report writing, and LaTeX document production.

Case studies

- These enable students to present their review and analysis of a statistical problem or research paper as a seminar to the MSc group and academic staff.

Guided reading

- Recommended reading is provided for all modules of the course in advance in a student handbook.

Course assignments and example classes

- Assignments are provided to further understanding and extend knowledge in modules, together with example classes covering problem solving.

Practical Sessions

- Practical sessions enable students to undertake practical statistical data analysis that complement lectures on almost all core topics and some optional topics.
- They enable students to learn statistical computing skills using modern statistical software such as R.
- They also enable students to learn to write a report on the statistical analysis of data.

Dissertation (MSc, but not Diploma students)

- Working on a dissertation enables students to undertake an in-depth study of a statistical problem involving modelling, computing and data analysis; almost all dissertations contain an account of the analysis of some body of real data.
- It enables students to learn to undertake directed research, report writing, presentation and communication of research results.

Seminar series

- The department has a weekly seminar series with external invited speakers which students are encouraged to attend to learn about current research in statistics. In addition there are many specialist seminar series that students may attend, according to their interests.

11. Programme Structures and Features

The MSc/Diploma in Applied Statistics programme is designed mainly as postgraduate training for those intending to apply statistics in areas such as scientific research, industry and administration.

The MSc is a 12-month programme running from October to September. It covers a wide range of statistical methods, and gives extensive hands-on experience of the analysis of real data from a wide variety of settings. Throughout the emphasis is on statistics as an applied subject, and a particular focus is the use of modern, computationally intensive methods.

The 9-month Diploma programme, running from October to June, is intended for students with a more practical background. There is no dissertation and greater weight is given to the basic parts of the course than in the case of the MSc.

Both MSc and Diploma students attend a comprehensive set of lectures, practical classes and supervision meetings.

Lecture courses

Coursework is divided into core and optional topics. Core topics cover some of the fundamentals of statistics. There is a menu of optional topics on further statistical methodology and applications. There are two 3-hour examination papers.

Paper I: Principles of Statistical Analysis

This consists of compulsory questions on the core subjects:

- Statistical Methods
- Statistical Theory
- Survival Analysis
- Time Series Analysis

Paper II: Further Statistical Methodology

This consists of about 10 questions on core and optional material: students are expected to answer five questions including two on the core topics.

Core Topics

- Multivariate Analysis
- Further Statistical Methods
- Computer Intensive Statistics
- MCMC and Applied Bayesian statistics

Optional Topics

- Infectious Diseases
- Combinatorial Optimization
- Mathematical Genetics
- Actuarial Science
- Statistical Data Mining

Practical Sessions

There are compulsory practical sessions each week in Michaelmas and Hilary Terms which students attend. Two practical sessions in each term are assessed. Students write reports on their analysis of a statistical problem which are marked and feedback is communicated to students via their supervisor. There is also a week-long practical assessment in Trinity Term where a major assignment involving the analysis of datasets is completed for assessment.

The distinctions between the MSc and the Diploma courses are:

The Diploma course ends after the examination in June. The MSc course involves in addition a project during the summer and submission of a substantial dissertation by the middle of September.

The choice between these courses rests partly on the student's preference for a 9- or 12-month course, but also on the decision of the Director of Graduate Studies.

Dissertation

MSc students are required to submit a dissertation on some topic with an agreed supervisor and approved by the MSc Supervisory Committee.

The dissertation is expected to include evidence that the candidate is capable of applying statistical methods, operational research methods, or stochastic modelling to realistic problems. Most dissertations will therefore contain an account of the analysis of some body of real data, and this work constitutes the summer project.

12. Support for Students and their learning

- All students are assigned a supervisor for the duration of the course. In practice the supervisor of a student's project/dissertation will not usually be the supervisor of their course work, a student's supervisor will usually change for the project/dissertation. Students will usually meet their supervisors regularly throughout the course of the year to discuss their progress, and in particular for the supervisor to advise on the project/dissertation.
- There is a Course Coordinator who makes the everyday arrangements for the course and who is in regular contact with students about course matters and arrangements. The Chairman of MSc Supervisory Committee, Director of Graduate Studies, Director of Studies and Academic Administrator are able to provide further guidance and support.
- There is a Course Handbook issued every year. This contains full synopses for the courses offered, reading lists, and general guidance and information about the MSc and the Department. Course material for students is available on the web at www.stats.ox.ac.uk/current_students/msc_and_diploma_in_applied_statistics
- Lecture courses are supported by problem sheets and classes, and practical classes.
- The Department has an extensive library of books and journals. Students also have access to the Radcliffe Science Library for journals and periodicals, and there is a library in each student's college.
- Students have access to the public computing facilities of the Department. The principal computing resource for the MSc is the PC laboratories, with an extensive range of software available.
- Extensive facilities for language development are available through the University's Language Centre.

- Within college each student will have an advisor and there will be a Tutor for Graduates and a Senior Tutor. Each college has an extensive support structure of advisors, welfare officers and peer support groups, and the University counselling service offers a range of assistance to students.

13. Criteria for Admission

The normal entry requirement is a first or upper second class degree (or equivalent) in an appropriate subject. For the MSc this usually means a degree with a large component of Mathematics or Statistics. There is a minimum requirement on a standard language test for applicants whose first language is not English. The application form also requests: a statement of the reasons for wanting to take the course; that applicants arrange statements of support from three referees; information about financial support.

A full statement of Admissions Criteria can be found at www.stats.ox.ac.uk/prospective_students/msc_in_applied_statistics/admissions_criteria

14. Methods for evaluating and improving the quality and standards of learning

The programme is set and administered by a Supervisory Committee. Students are in regular contact with the Course Coordinator who makes the everyday arrangements for the course, and also have access to the Chairman of the Supervisory Committee, Director of Graduate Studies and Director of Studies.

Students elect the MSc representative on the Department's Graduate Liaison Committee, which meets termly and at which student concerns are discussed, in addition to student feedback being sought via questionnaires.

Responsibility for the course is vested in the Mathematical, Physical and Life Sciences Division. The Divisional Board has formal responsibility for the maintenance of educational quality and standards in the broad subject areas, and exercises its responsibility through its Academic Committee, and in particular the scrutiny it gives to the new course proposals and proposed course revisions, to reports of examiners, and to more general questions of academic policy.

The Division carries out reviews of the course. Changes in regulations require Divisional and EPSC approval. The Divisional Board is also responsible for academic appointments and for the arrangements (including mentoring, appraisal, and reviews of performance) for the support of newly appointed lecturers and for monitoring their teaching competence.

15. Regulation of assessment

Assessment regulations are provided to students at the beginning of the course in the Course Handbook.

For MSc candidates the overall assessment is based on four parts:

Paper I: Principles of Statistical Analysis
Paper II: Further Statistical Methodology
Assessed Practical Work
Dissertation

Each of these parts has equal weight and contributes 25% to the overall total mark. Candidates can pass, pass with distinction, or fail. The overall pass mark is 50%. At least 70% is required for a distinction.

Diploma students take only the written examination papers and the assessed practical work. The corresponding weights for each part of the course are 37.5%, 25% and 37.5% respectively.

Papers I and II are 3-hour examination papers. Generally one examination question is set per 8-10 hour lecture course but a question would usually also be set for a 6 hour lecture course.

Four computer-based assessed practical assignments are carried out in Michaelmas and Hilary terms, generally in weeks 5 and 8. These are normally based on exercises done in the weekly practical classes. There is also a week-long practical assessment in Trinity Term. In past years this has taken place in week 5. This comprises a number of exercises involving the analysis of datasets. A complete report is required at the end of the week.

Each of the shorter practical assignments contributes 12.5% to the overall assessed practical mark and the week-long Trinity Term practical 50%.

MSc students must submit a dissertation of no more than 12,000 words. The dissertation project is carried out over the summer period, from the last written examination to the dissertation submission date on 15 September.

The qualitative descriptors levels of performance are, in summary:

Distinction: The candidate shows excellent skills in modelling, reasoning and problem-solving. He/she demonstrates an excellent knowledge of the material, and is able to use it innovatively in unfamiliar contexts.

Pass: The candidate shows good or very good skills in modelling, reasoning and problem-solving. He/she demonstrates a good or very good knowledge of much of the material.

Fail: The examiners consider that the candidate is not worthy of an MSc/Diploma. There is little evidence of competence in the topics examined; the work is likely to show major misunderstanding and confusion, coupled with inaccurate calculations. The candidate either leaves without a degree or may retake the examination the following year.

(If a candidate fails the MSc but nevertheless shows sufficient merit to pass the Diploma, the candidate has the option of retaking the examination the following year or of being issued with a diploma.)

16. Indicators of quality and standards

The following indications have broadly confirmed that the standard of awards is appropriate, and the quality of teaching and research is high.

- External Examiners' Reports
- QAA Subject Review in 2000
- The University's internal EPSC Review in 2005

- The Department achieved grade 5* in the Research Assessment Exercise in 2001