

Mathematics, Statistics and Operational Research

A graduate in Mathematics, Statistics or OR, depending on their chosen focus of study, typically will have the ability to:

- demonstrate knowledge of key mathematical concepts and topics
- abstract the essentials of problems and formulate them mathematically and in symbolic form so as to facilitate their analysis and solution
- present mathematical arguments and the conclusions from them with accuracy and clarity
- have skills relating to rigorous argument and solving problems in general, and a facility to deal with abstraction including the logical development of formal theories
- have skills relating to formulating physical theories in mathematical terms, solving the resulting equations analytically or numerically, and giving physical interpretations
- focus on statistics that will have skills relating to the design and conduct of experimental and observational studies and the analysis of data resulting from them
- have skills relating to formulating complex problems of optimisation and interpreting the solutions in the original contexts of the problems
- have the ability to learn independently using a variety of media
- work with patience and persistence, pursuing problem solutions to their conclusion
- have good general skills of time management and organisation
- be adaptable, in particular displaying readiness to address new problems from new areas
- transfer knowledge to assess problems logically and to approach them analytically
- have highly developed numeracy and ICT skills
- have communication skills such as the ability to write coherently and clearly
- apply concepts and principles in loosely-defined contexts, showing effective judgement in selecting and applying tools and techniques
- demonstrate appropriate transferable skills and the ability to work with relatively little guidance or support.

Mathematics is rooted in the systematic development of methods to solve practical problems in areas such as surveying, mechanical construction and commerce. Such methods have a wide range of application. Thus generalisation and abstraction became important features and mathematics became a science involving strict logical deduction with conclusions that follow with certainty and confidence from clear starting points. Mathematics is fundamental to almost all situations that require an analytical model-building approach.

Statistics encompasses the science of collecting, analysing and interpreting data and has become much concerned with the design processes for observational and experimental studies.

To check the growing range of resources produced by the Subject Centre to support employability and the use of this profile (including the Skills and Attributes map), go to **www.mathstore.ac.uk**.

This profile, produced in 2004, is based on the QAA benchmark to be found at **www.qaa.ac.uk/academicinfrastructure/benchmark/honours/default.asp**.

Statistics uses probability theory as part of the process of making inferences from limited data to underlying structures - looking for the patterns.

Operational research (OR) is concerned with complex optimisation procedures with significant mathematical underpinnings and non-mathematical but academically rigorous problem-structuring methods. It has applications throughout industry, business and commerce, in government, the health and social services, and in the armed forces. Model building is crucial. Some institutions use titles other than OR for degree programmes in this area. One such title is management science.

Graduates can be found throughout industry, business and commerce, the public and private sectors, with large employers and in small organisations. Employers value the intellectual ability and rigour and reasoning skills that mathematics, statistics and operational research students can acquire, their familiarity with numerical and symbolic thinking, and the analytic approach to problem-solving which is their hallmark.