Programme Specification

A statement of the knowledge, understanding and skills that underpin a taught programme of study leading to an award from The University of Sheffield

Programme Details

1. Programme title	Mathematics
2. Programme code	MAST30
3. QAA FHEQ level	7 (Masters)
4. Faculty	Science
5. Department	School of Mathematics and Statistics
6. Other departments providing credit bearing modules for the programme	None
7. Accrediting Professional or Statutory Body	Not applicable
8. Date of production/revision	March 2011, March 2012, March 2016, September 2022

Awards	Type of award	Duration
9. Final award	MSc	12 months
10. Intermediate awards	PG Diploma	12 months
	PG Certificate	12 months

Programme Codes

11. JACS code(s) *Select between one and three codes from the [HESA website.](#)*	G100		
12. HECoS code(s) S*elect between one and three codes from the [HECoS vocabulary.](#)*	100403		

Programme Delivery

13. Mode of study	Full-time
14. Mode of delivery	In person

15. Background to the programme and subject area

Mathematics involves the study of intangible objects (such as numbers, functions, equations and spaces) which necessarily arise in our attempts to describe and analyse the world about us. It is a fascinating subject of great beauty and power. Its abstraction and universality lie behind its huge range of applications, to physical and biological sciences, engineering, finance, economics, secure internet transactions, reliable data transmission, medical imaging and pharmaceutical trials, to name a few. Mathematicians were responsible for the invention of modern computers, which in turn have had a great impact on mathematics and its applications.

Teaching in the School of Mathematics and Statistics (SoMaS) is shared between specialist staff in each of Pure Mathematics, Applied Mathematics, and Probability and Statistics. There are specialist MSc programmes in Statistics, and this general MSc is based on options mainly in Pure and Applied Mathematics. Pure mathematics is a subject rich in patterns and one in which the development of a theory may begin with identification of behaviour common to various simple situations and proceed, through precise analysis, to the point where rigorous general results are obtained. Solutions of particular problems may involve standard analytical techniques, for example from calculus, or the application of an abstract general theory to a particular concrete example. In applied mathematics and in probability and statistics, a common approach to practical problems, from a wide variety of contexts, is to first model or interpret them mathematically and then apply mathematical or statistical methods to find a solution. In all three areas it is vital that work should be presented in a clear, precise and logical way so that it can be understood by others. For these reasons, graduates from programmes involving mathematics are highly regarded, by a wide range of employers, for their analytical, problem-solving and communication skills as much as for their knowledge of mathematics.

Staff in all three areas have international reputations in research, with 96% of research activities being rated as world leading or internationally excellent in the 2021 Research Excellence Framework exercise. Many modules are taught by leading experts in the area in which the module is based. In Pure Mathematics there are particular research strengths in topology, algebra and algebraic geometry, and number theory, and there are modules available in all these areas. Applied Mathematics research is strong not only in traditional areas of the subject, such as fluid mechanics, but in interdisciplinary areas such as solar physics, particle astrophysics, environmental dynamics and mathematical biology. The School was instrumental, with other departments in the University, in setting up the Sheffield-based NERC Earth Observation Centre of Excellence for Terrestrial Carbon Dynamics.

Further information is available from the school web site: http://www.shef.ac.uk/maths

Students will be attracted to this course upon the successful completion of a BSc Mathematics degree, in preference to pursuing an MMath Mathematics qualification, or may come to it from outside Sheffield with an appropriate qualification.

16. Programme aims

MSc Mathematics aims to:	
A1	provide students with internal choice to accommodate the diversity of students' interests where students may choose either to study a range of Applied and Pure Mathematics or specialise in either mathematical discipline at Masters level;
A2	provide an intellectual environment conducive to learning;

A3	prepare students for careers which use their mathematical (and or statistical training as appropriate), including further research;
A4	provide teaching which is informed and inspired by the research and scholarship of the staff;
A5	provide students with assessments of their achievements over a range of mathematical (and or statistical skills as appropriate), and to identify and support academic excellence.

17. Programme learning outcomes

Knowledge and understanding

On successful completion of the programme, students will be able to demonstrate knowledge and understanding of:

		Links to Aim(s)
K1	have acquired a specialised knowledge and understanding of at least one of Pure Mathematics and Applied Mathematics;	1-5
K2	have acquired a detailed knowledge and understanding of specialist mathematical topics.	1-4

Skills and other attributes

On successful completion of the programme, students will be able to:

S1	apply core concepts and principles in well-defined contexts;	2-5
S2	show judgement in the selection and application of mathematical tools and techniques;	2-5
S3	demonstrate skill in comprehending problems and abstracting the essentials of problems;	2-5
S4	formulate problems mathematically;	2-5
S5	obtain solutions of problems by appropriate methods.	2-5

18. Learning and teaching methods

Lectures
A 15-credit lecture-module generally comprises about 20 lectures, but some material may be covered by directed reading. In lectures the important points in the lecture notes are explained and illustrated, with computer demonstrations when appropriate.

Project and Assignment work
All modules require some practical work, requiring the integration of theory with practical skills.

Dissertation
Teaching for the dissertation is through supervision by one or more members of School staff. Students will experience the key phases of a relatively large piece of work: planning to a deadline; researching background information; acquisition and validation of data; problem specification; carrying out of relevant analyses; and reporting, both at length through the dissertation and in summary through a presentation.

Personal Tutorials
The School runs a personal tutorial system, which is essentially pastoral: tutors are available to provide personal support and general academic guidance.

Independent learning
This is the cornerstone of success in the programme. It is vital for the assimilation of the material provided, for the preparation of written reports, and other presentations, and for the proper use of sophisticated software.

Problems
Students are required to submit work on specified problems for marking at regular intervals.

19. Assessment and feedback methods

The principal method of summative assessment for the taught modules is through examinations, held in two periods at the end of the first and second semesters. The summative assessment for the project module, is a final dissertation of 10-20,000 words which is supported formatively by regular one to one meetings with the supervisor, where feedback and direction is given. There are also a few optional modules with a continuous assessment elements, such as assignments.

The provision of feedback through formative assessment varies between modules, according to learning outcomes. For example, some modules use problems classes to work through formative problems, where appropriate. Others use weekly marked homeworks, based on a set of structured problem sheets that align with the lecture material.

20. Programme structure and student development

This full-time course is offered over 12 months from September and finishing in the following September. The components must be completed over both Semesters and the dissertation must be completed before the end of the summer. All students take modules, drawn from a prescribed list to give a total of 180 credits (120 credits from 15- and 30-credit modules and a dissertation of 60 credits).

Successful completion of the programme leads to the award of the MSc with either 'pass', 'pass with merit' or 'pass with distinction' grade.

Depending upon students' choices for specialism, students are exposed to a myriad of skills with specific skills where appropriate according to the individual student's specialism. This could include training in the professional skills of tackling substantial projects and presentation of results; the preparing and writing of intelligible reports; in practical examples or data handling enhancing knowledge regarding underlying theory and computational tools. Students extend their skills for general professional development, including the use of other forms of presentation; group working; the illustration of the interpersonal skills involved in a career in mathematics, teaching and further research study.

Detailed information about the structure of programmes, regulations concerning assessment and progression and descriptions of individual modules are published in the University Calendar available online at http://www.sheffield.ac.uk/calendar/.

21. Criteria for admission to the programme

Detailed information regarding admission to programmes is available from the University's On-Line Prospectus at http://www.shef.ac.uk/courses/.

22. Reference points

The learning outcomes have been developed to reflect the following points of reference:

Subject Benchmark Statements
https://www.qaa.ac.uk/quality-code/subject-benchmark-statements

Framework for Higher Education Qualifications (2014)
https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf

University Strategic Plan
http://www.sheffield.ac.uk/strategicplan

Learning and Teaching Strategy (2016-21)
https://www.sheffield.ac.uk/polopoly_fs/1.661828!/file/FinalStrategy.pdf

23. Additional information

Regular research seminars are provided that cover the scope of aspects of Mathematics & Statistics which are accessible to and interesting for students on this programme.

This specification represents a concise statement about the main features of the programme and should be considered alongside other sources of information provided by the teaching department(s) and the University. In addition to programme specific information, further information about studying at The University of Sheffield can be accessed via our Student Services web site at http://www.shef.ac.uk/ssid.