**Programme Specification**

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| **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 he/she passes the programme. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the programme handbook. The accuracy of the information contained in this specification is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education. |

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| **Degree and Programme Title: MMath in Mathematics** |

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| 1. **Awarding Institution/Body** | University of Kent |
| 1. **Teaching Institution** | University of Kent |
| 1. **School responsible for management of the programme** | School of Mathematics, Statistics and Actuarial Science |
| 1. **Teaching Site** | Canterbury |
| 1. **Mode of Delivery** | Full-time |
| 1. **Programme accredited by** |  |
| 1. **Final Award** | MMath, BSc (Hons), BSc, Diploma, Certificate |
| 1. **Programme** | Mathematics |
| 1. **UCAS Code (or other code)** |  |
| 1. **Credits/ECTS Value** | 480 credits (ECTS 240) |
| 1. **Study Level** | Undergraduate (level 7) |
| 1. **Relevant QAA subject benchmarking group(s)** | Mathematics, Statistics and Operational Research |
| 1. **Date of creation/revision** | Revised version December 2015 |
| 1. **Intended Start Date of Delivery of this Programme** | From September 2013 |

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| 1. **Educational Aims of the Programme**   The programme aims to: |
| * Provide an excellent quality of mathematical education, informed by research and scholarship * Equip students with a broad base of knowledge and skills to analyse and solve mathematically based problems showing a level of originality where necessary * Ensure students are competent in communicating the knowledge, rationale and conclusions, both orally and in writing * Ensure students are competent in the use of information technology and can use appropriate software to solve problems * Develop in students the ability to work independently with a minimum amount of supervision within agreed guidelines * Prepare successful students with the depth of mathematical knowledge to enter postgraduate studies at the doctorate level in mathematics and other closely related subjects * Produce graduates of value to the region and nationally, in possession of key mathematical knowledge and personal skills, with the capacity to learn |

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| **16 Programme Outcomes**  The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the subject benchmarking statement for Mathematics, Statistics and Operational Research (SB). |

**A. Knowledge and Understanding of:**

1. The fundamental concepts and techniques of calculus, algebra, analysis, geometry, differential equations, numerical mathematics and probability and inference (SB3.8)
2. Methods and techniques of mathematics, including more advanced material with mathematical ideas from more than one area (SB3.19)
3. Nonlinear phenomena and related mathematical methods (SB3.17)
4. Applications of mathematical theories, methods and techniques to a range of associated problems(SB3.7, SB3.12, SB3.13, SB3.17)
5. The role of logical mathematical argument and deductive reasoning including the formal process of mathematical proof (SB3.12, SB3.13)
6. Project work on an advanced mathematical topic based on substantial independent work

**Teaching/learning and assessment methods and strategies used to enable outcomes to be achieved and demonstrated**

**Teaching/learning:** Lectures given by a wide variety of lecturers with different research backgrounds; supervised example classes; computer laboratory classes; dissertation module

**Assessment:** Coursework involving problems; computer assignments; projects; class tests; dissertation; written unseen examinations

**Skills and Other Attributes**

**B. Intellectual Skills (SB3.21, SB3.22):**

1. Ability to demonstrate a good understanding of the main body of knowledge for Mathematics
2. Ability to demonstrate a very good level of skill in calculation and manipulation of mathematical material and be capable of solving complex problems formulated within it.
3. Ability to apply a range of concepts and principles in various contexts relevant to mathematics
4. Ability to develop and evaluate logical arguments in mathematics
5. Ability to demonstrate skill in solving mathematical problems by various appropriate methods
6. Ability in relevant computer skills and usage
7. Ability to work with relatively little guidance
8. Ability to plan and develop an advanced project in mathematics

**Teaching/learning and assessment methods and strategies used to enable outcomes to be achieved and demonstrated**

**Teaching/learning:** Lectures given by a wide variety of lecturers with different research background; supervised example classes; computer laboratory classes, dissertation module

**Assessment:** Coursework involving problems; computer assignments; projects; tests; dissertation; written unseen examinations.

**C. Subject-specific Skills (SB3.21):**

1. Ability to demonstrate knowledge of core and advanced mathematical concepts and topics, both explicitly and by applying them to the solution of problems
2. Ability to comprehend problems, abstract the essentials of problems and formulate them mathematically and in symbolic form so as to facilitate their analysis and solution
3. Ability to use computational and more general IT facilities as an aid to mathematical processes
4. Ability to present mathematical arguments and the conclusions from them with clarity and accuracy

**Teaching/learning and assessment methods and strategies used to enable outcomes to be achieved and demonstrated**

**Teaching/learning:** Key skills module; computer laboratory classes; dissertation module; lectures; supervised examples classes.

**Assessment:** Coursework involving problems; computer assignments; tests; dissertation; projects; written unseen examinations.

**D. Transferable Skills (SB3.24):**

1. Problem-solving skills, relating to qualitative and quantitative information
2. Communications skills, covering both written and oral communication
3. Numeracy and computational skills
4. Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches
5. Information technology skills such as scientific word processing, internet communication, etc.
6. Personal and interpersonal skills, work as a member of a team
7. Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working
8. Study skills needed for continuing professional development

**Teaching/learning and assessment methods and strategies used to enable outcomes to be achieved and demonstrated**

**Teaching/learning:** Transferable skills pervade all modules and are developed and demonstrated through key skills module; computer laboratory classes; project; group work; dissertation module

**Assessment:** 1-5 are assessed through Coursework involving problems; computer assignments; oral presentations; project assessments; dissertation. 6 and 7 are not directly assessed but their effective use will enhance the performance in all modules.

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| For more information on the skills developed by individual modules and on the specific learning outcomes associated with any Certificate, Diploma or BSc non-honours awards relating to this programme of study, see the module mapping table, located at the end of this specification. |

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| **17 Programme Structures and Requirements, Levels, Modules, Credits and Awards**  This programme is studied over four years full-time.  The programme is divided into four stages, each stage comprising modules to a total of 120 credits. Students must successfully complete each module in order to be awarded the specified number of credits for that module. One credit corresponds to approximately ten hours of 'learning time' (including all classes and all private study and research). Thus obtaining 120 credits in an academic year requires 1,200 hours of overall learning time. For further information on modules and credits refer to the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html>.  Each module and programme is designed to be at a specific level. For the descriptors of each of these levels, refer to Annex 2 of the Credit Framework at <http://www.kent.ac.uk/teaching/qa/credit-framework/creditinfoannex2.html>. To be eligible for the award of an honours MMath degree students must obtain 480 credits, at least 330 credits at level 5 or above including at least 120 credits at level 7. In addition, and in line with other MMath programmes, there are minimum average mark requirements for progression from Stage 1 to Stage 2, from Stage 2 to Stage 3 and from Stage 3 to Stage 4; these are detailed below.  Compulsory modules are core to the programme and must be taken by all students studying the programme. Optional modules provide a choice of subject areas, from which students will select a stated number of modules. Students will be advised to take a balanced programme, not exceeding 75 credits in any one term. Neither condonement nor compensation is allowed for MA578 (marked with an asterisk below). Trailing and retrieving credit is not applicable due to the requirements for progression.  Where a student fails a module(s) due to illness or other mitigating circumstances, such failure may be condoned, subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework at <https://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html>.  Where a student fails a module(s), but has marks for such modules within 10 percentage points of the pass mark, the Board of Examiners may nevertheless award the credits for the module(s), subject to the requirements of the Credit Framework and provided that the student has achieved the **programme** learning outcomes. For further information refer to the Credit Framework at <https://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html>.  Students successfully completing Stage 1 of the MMath programme with an average mark of 60% or over (at the first attempt) and meeting credit framework requirements will progress to Stage 2 of the programme. Students who complete Stage 1 successfully, but with an average mark below 60% (at the first attempt), will be transferred to the 3-year BSc (Hons) Mathematics programme.  Students successfully completing Stage 1 of the MMath programme and meeting credit framework requirements who do not successfully complete Stage 2 will be eligible for the award of the Certificate in Mathematics. Students who complete Stage 2 successfully, but with an average mark that year below 60% (at the first attempt) will be transferred to the 3-year BSc (Hons) Mathematics programme. Students who complete Stage 2 of the programme with an average mark in that year of 60% or over (at the first attempt) will progress to stage 3 of the MMath programme.  Students successfully completing Stage 1 and Stage 2 of the MMath programme and meeting credit framework requirements but who do not successfully complete Stage 3 will be eligible for the award of the Diploma in Mathematics. Students who complete Stage 3 successfully, but with an average mark in that year below 60% (at the first attempt) can be awarded a BSc (Hons) in Mathematics, provided they have met the requirements of that programme. Students who complete Stage 3 of the programme with an average mark in that year of 60% or over (at the first attempt) may either progress to stage 4 of the MMath programme or be awarded a BSc (Hons) in Mathematics.  For the purpose of overall classification, the University’s standard weighting of stages for four year undergraduate degree programmes will be used, namely 20% for stage 2, 30% for stage 3 and 50% for stage 4. Candidates not meeting the progression threshold will be classified under the standard Credit Framework requirements for the alternative exit award. | | | | | |
| **Code** | **Title** | **Level** | | **Credits** | **Term(s)** | |
| **Stage 1** | | | | | | |
| **Compulsory Modules** | | | | | | |
| MA306 | Statistics | 4 | | 15 | Spring | |
| MA321 | Calculus and Mathematical Modelling | 4 | | 30 | Autumn & Spring | |
| MA322 | Proofs and Numbers | 4 | | 15 | Autumn | |
| MA323 | Matrices and Probability | 4 | | 15 | Autumn & Spring | |
| MA324 | Exploring Mathematics | 4 | | 15 | Autumn & Spring | |
| MA325 | From Geometry to Algebra | 4 | | 30 | Autumn & Spring | |
| **Stage 2** (implemented from 2014/15) | | | | | | |
| **Compulsory Modules** | | | | | | |
| MA522 | Analysis | 5 | | 15 | Autumn | |
| MA553 | Linear Algebra | 5 | | 15 | Autumn | |
| MA629 | Probability and Inference | 5 | | 15 | Autumn | |
| Students must select at least two of the following modules | | | | | | |
| MA564 | Functions of Several Variables | 5 | | 15 | Spring | |
| MA588 | Mathematical Techniques and Differential Equations | 5 | | 15 | Spring | |
| MA565 | Groups and Rings | 5 | | 15 | Spring | |
| **Optional Modules** Students must select modulesfrom the following so as to give a total of 120 credits for Stage 2. | | | | | | |
| MA584 | Computational Mathematics | 5 | | 15 | Spring | |
| MA590 | Mathematical Modelling | 5 | | 15 | Autumn or Spring | |
| MA566 | Number Theory | 5 | | 15 | Autumn or Spring | |
| CB668 | Linear Programming and its Applications (added 2015) | 6 | | 15 | Autumn | |
| MA632 | Regression Models | 5 | | 15 | Spring | |
| **Stage 3** | | | | | | |
| **Compulsory Modules** | | | | | | |
| MA569 | Starting Research in the Mathematical Sciences | 6 | | 15 | Autumn & Spring | |
| **Optional Modules** Students must select 105 creditsfrom the following. Availability of modules will depend on whether appropriate pre-requisite and co-requisite modules have been passed and on whether the module is available, as not all modules run every year. Students may select one module from the following pairs of modules running at Stages 3 and 4, but may not take both: MAST6003 and MAST7003; MA595 and MA995; MA603 and MA561; MA605 and MA965; MAST6004 and MAST7004; MA609 and MA969; MA611 and MA971; MA617 and MA871; MAST6001 and MAST7001; MAST6002 and MAST7002; MAST6005 and MAST7005. Scheduling of particular modules in autumn or spring term where indicated as ‘Autumn or Spring’ will ensure a reasonable balance across terms for those modules that are offered. For further information, refer to the handbook  [https://www.kent.ac.uk/smsas/resources/index.html?tab=handbooks](https://www.kent.ac.uk/smsas/resources/index.html?tab=handbooks%20framework/creditinfo.html) | | | | | | |
| MA538 | Applied Bayesian Modelling (added 2015) | | 6 | 15 | Autumn | |
| MA549 | Discrete Mathematics | | 6 | 15 | Autumn | |
| MA563 | Calculus of Variations | | 6 | 15 | Autumn | |
| MA567 | Topology (added 2014) | | 6 | 15 | Autumn or Spring | |
| MA568 | Orthogonal Polynomials and Special Functions (added 2014) | | 6 | 15 | Autumn or Spring | |
| MA572 | Complex Analysis | | 6 | 15 | Autumn | |
| MA574 | Polynomials in Several Variables | | 6 | 15 | Spring | |
| MAST6003 | Groups and representations | | 6 | 15 | Autumn or Spring | |
| MA577 | Elements of Abstract Analysis | | 6 | 15 | Spring | |
| MA587 | Numerical Solution of Differential Equations | | 6 | 15 | Autumn | |
| MA591 | Nonlinear Systems and Mathematical Biology | | 6 | 15 | Autumn | |
| MA593 | Topics in Applied Mathematics (2013 and  2014 only) | | 6 | 30 | Autumn & Spring | |
| MA595 | Graphs and Combinatorics (added 2015) | | 6 | 15 | Autumn or Spring | |
| MA603 | Introduction to Lie groups and Algebras  (added 2015) | | 6 | 15 | Autumn or Spring | |
| MA605 | Symmetries, Groups and Invariants (added  2015) | | 6 | 15 | Autumn or Spring | |
| MAST6003 | Quantum Mechanics (added 2015) | | 6 | 15 | Autumn or Spring | |
| MA609 | Applied Differential Geometry (added 2015) | | 6 | 15 | Autumn or Spring | |
| MA611 | Introduction to Functional Analysis (added  2015) | | 6 | 15 | Autumn or Spring | |
| MA617 | Asymptotics and Perturbation Methods  (added 2015) | | 6 | 15 | Autumn or Spring | |
| MA636 | Stochastic Processes | | 6 | 15 | Autumn | |
| MA639 | Time Series Modelling and Simulation | | 6 | 15 | Spring | |
| MAST6001 | Symmetry methods for differential equations (added 2016) | | 6 | 15 | Autumn or Spring | |
| MAST6002 | Linear and nonlinear waves (added 2016) | | 6 | 15 | Autumn or Spring | |
| MAST6005 | Operators and matrices (added (2016) | | 6 | 15 | Autumn or Spring | |
| **Stage 4** | | | | | | |
| **Compulsory Modules** | | | | | | |
| MA578\* | Dissertation for MMath Mathematics | 7 | | 30 | Autumn & Spring | |
| **Optional Modules** Students must select 90 credits from the following. Availability of modules will depend on whether appropriate pre-requisite and co-requisite modules have been passed and on whether the module is available, as not all modules run every year. Students may select one module from the following pairs of modules running at Stages 3 and 4 but may not take both: MAST6003 and MAST7003; MA595 and MA995; MA603 and MA561; MA605 and MA965; MAST6004 and MAST7004; MA609 and MA969; MA611 and MA971; MA617 and MA871; MAST6001 and MAST7001; MAST6002 and MAST7002; MAST6005 and MAST7005. Scheduling of particular modules in autumn or spring term where indicated as ‘Autumn or Spring’ will ensure a reasonable balance across terms for those modules that are offered. For further information, refer to the handbook  [https://www.kent.ac.uk/smsas/resources/index.html?tab=handbooks](https://www.kent.ac.uk/smsas/resources/index.html?tab=handbooks%20framework/creditinfo.html) | | | | | | |
| MA561 | Introduction to Lie groups and Algebras | 7 | | 15 | Autumn or Spring | |
| MA562 | Nonlinear Waves and Solitons | 7 | | 15 | Autumn or Spring | |
| MA871 | Asymptotics and Perturbation Methods | 7 | | 15 | Autumn or Spring | |
| MA962 | Geometric Integration | 7 | | 15 | Autumn or Spring | |
| MA963 | Poisson Algebra and Combinatorics | 7 | | 15 | Autumn or Spring | |
| MA964 | Applied Algebraic Topology | 7 | | 15 | Autumn or Spring | |
| MA965 | Symmetries, Groups and Invariants | 7 | | 15 | Autumn or Spring | |
| MAST7003 | Groups and representations (added 2016) | 7 | | 15 | Autumn or Spring | |
| MA966 | Diagram Algebras | 7 | | 15 | Autumn or Spring | |
| MAST7004 | Quantum Mechanics | 7 | | 15 | Autumn or Spring | |
| MA968 | Mathematics and Music | 7 | | 15 | Autumn or Spring | |
| MA969 | Applied Differential Geometry | 7 | | 15 | Autumn or Spring | |
| MA970 | Nonlinear Analysis and Optimisation | 7 | | 15 | Autumn or Spring | |
| MA971 | Introduction to Functional Analysis | 7 | | 15 | Autumn or Spring | |
| MA972 | Algebraic Curves in Nature | 7 | | 15 | Autumn or Spring | |
| MA973 | Basic Differential Algebra | 7 | | 15 | Autumn or Spring | |
| MA995 | Graphs and Combinatorics (added 2015) | 7 | | 15 | Autumn or Spring | |
| MAST7001 | Symmetry methods for differential  Equations (added 2016) | 7 | | 15 | Autumn or Spring | |
| MAST7002 | Linear and nonlinear waves (added 2016) | 7 | | 15 | Autumn or Spring | |
| MAST7005 | Operators and matrices (added 2016) | 7 | | 15 | Autumn or Spring | |
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| **18 Work-Based Learning**  Disability Statement: Where disabled students are due to undertake a work placement as part of this programme of study, a representative of the University will meet with the work placement provider in advance to ensure the provision of anticipatory and reasonable adjustments in line with legal requirements. |
| Where relevant to the programme of study, provide details of any work-based learning element, inclusive of employer details, delivery, assessment and support for students: |
| * Not relevant |

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| **19 Support for Students and their Learning** |
| * School and University induction programme * School handbooks for each stage * Library services, see <http://www.kent.ac.uk/library/> * Student Support <http://www.kent.ac.uk/studentsupport/> * Student Wellbeing www.kent.ac.uk/student wellbeing/ * Centre for English and World Languages, see <http://www.kent.ac.uk/cewl/index.html> * Student Learning Advisory Service, see <http://www.kent.ac.uk/uelt/about/slas.html> * PASS system, see  <http://www.kent.ac.uk/fso/student-support/> * Academic Advisor system * Kent Union, see [www.kentunion.co.uk/](http://www.kentunion.co.uk/) * Careers and Employability Services, see [www.kent.ac.uk/ces/](http://www.kent.ac.uk/ces/) * Counselling Service [www.kent.ac.uk/counselling/](http://www.kent.ac.uk/counselling/) * Information Services (computing and library services), see [www.kent.ac.uk/is/](http://www.kent.ac.uk/is/) * Undergraduate student representation at School, Faculty and Institutional levels * International Development Office, see [www.kent.ac.uk/international/](http://www.kent.ac.uk/international/) * Medical Centre, see  <http://www.kent.ac.uk/medical/> * University and School web pages, including Student Data System and Moodle Virtual Learning Environment * Computing labs and study rooms |

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| **20 Entry Profile**  The minimum age to study a degree programme at the university is normally at least 17 years old by 20 September in the year the course begins. There is no upper age limit. |
| 20.1 **Entry Route**  For fuller information, please refer to the University prospectus |
| Candidates must satisfy the general admission requirements of the University and of the School of Mathematics, Statistics and Actuarial Science. The usual offer level for the MMath programme is AAA or equivalent.  Mature and overseas students will be considered on an individual basis. In addition, international students also need to demonstrate their proficiency in English: Average 6.5 in IELTs test with minimum 6.0 in reading and writing or equivalent.  Any students not meeting the progression criteria at any stage (average mark of 60% or over at first attempt) will be transferred into the standard 3-year degree programme.  Students can also enter the MMath programme by transfer from the standard 3-year degree programmes at the end of Stage 2, provided they have passed the core modules and met the average mark threshold of Stage 2 of the MMath programme. |
| 20.2 **What does this programme have to offer?** |
| * An excellent grounding in Mathematics at university level * The opportunity to study mathematics including its real-life applications in a friendly and research active environment with a dedicated professional teaching staff * The development of a broad range of skills that are highly sought after by employers, and which open up a wide variety of careers * The enhancement of core mathematics knowledge and skills with the further training needed for a mathematics-based career |
| 20.3 **Personal Profile** |
| * A keen interest in mathematics and how it is used in the modern world * A desire to gain wide mathematical knowledge, to explore a range of real-life applications, and further to develop a deep interest in some particular mathematical topics * A desire to develop computational and problem-solving skills |

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| 21 **Methods for Evaluating and Enhancing the Quality and Standards of Teaching and Learning** |
| 21.1 **Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards** |
| * Student module evaluations * Annual programme and module monitoring reports, see <http://www.kent.ac.uk/teaching/qa/codes/taught/annexe.html> * External Examiners system, see <http://www.kent.ac.uk/teaching/qa/codes/taught/annexk.html> * Periodic programme review, <http://www.kent.ac.uk/teaching/qa/codes/taught/annexf.html> * Annual staff appraisal * Peer observation * Quality Assurance Framework, <http://www.kent.ac.uk/teaching/qa/codes/index.html> * QAA Higher Education Review, see <http://www.qaa.ac.uk/InstitutionReports/types-of-review/IRENI/Pages/default.aspx> * Personal Academic Support System (**PASS**): monitoring attendance and other measures of diligence within the system of personal academic advisors, student support advisor and senior tutor * Three-stage vetting process of examination questions: module team, moderators and external examiners |
| 21.2 **Committees with responsibility for monitoring and evaluating quality and standards** |
| * Staff Student Consultative Committee * School Learning and Teaching Committee * Faculty Learning and Teaching Committee * University Learning and Teaching Board * Board of Examiners * Module team * Faculty Board |
| 21.3 **Mechanisms for gaining student feedback on the quality of teaching and their learning experience** |
| * Student module evaluations * Staff Student Consultative Committee * Student representation (School, Faculty and Institutional level) * Meeting with personal academic advisors, student support advisor and senior tutor * Staff have office hours during which students can discuss their modules * Informal meetings and social contact with students (including student role in recruitment activities) * Annual NSS |
| 21.4 **Staff Development priorities include:** |
| * Minimum expected qualification for appointment is a PhD in an appropriate mathematical subject and an active research profile of international quality * PGCHE requirements for new members of staff * HEA (associate) fellowship membership * Annual appraisals * Institutional Level Staff Development Programme * Academic Practice Provision (PGCHE, ATAP and other development opportunities) * Professional body membership and requirements * Programme team meetings * Research seminars * Conferences * Study leave * Mentoring of new staff * Committee and module team responsibilities * Staff development courses |

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| 22 **Indicators of Quality and Standards** |
| * Results of periodic programme review 2009 * QAA Higher Education Review 2015 * Annual External Examiner reports * Annual programme and module monitoring reports * Degree results and employment record * 95% of our Mathematics research output was rated as international quality or above in the 2008 Research Assessment Exercise |
| 22.1 **The following reference points were used in creating these specifications:** |
| * QAA UK Quality Code for Higher Education * QAA Benchmarking statements for Mathematics, Statistics and Operational Research * School and Faculty plan * University Plan/Learning and Teaching Strategy * Staff research activities |

Last updated October 2012

**Module Map: compulsory and restricted-choice modules only**

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|  | **A: Knowledge and understanding** | | | | | |  | **B: Intellectual skills** | | | | | | | |  | **C: Subject specific skills** | | | |  | **D: Transferable skills** | | | | | | | |
| **Level and Module** | A1 | A2 | A3 | A4 | A5 | A6 |  | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |  | C1 | C2 | C3 | C4 |  | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 |
| **Level 4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA306 | X |  | X |  | X |  |  | X | X | X | X | X | X |  |  |  | X | X | X | X |  | X | X | X |  | X |  | X | X |
| MA321 | X |  | X | X | X |  |  | X | X | X | X | X | X |  |  |  | X | X | X | X |  | X | X | X |  |  |  | X | X |
| MA322 | X |  |  |  | X |  |  | X | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X |  |  |  | X | X |
| MA323 | X |  |  |  | X |  |  | X | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X |  |  |  | X | X |
| MA324 | X |  | X | X | X |  |  | X | X | X | X | X | X | X |  |  | X | X | X | X |  | X | X | X | X | X | X | X | X |
| MA325 | X |  |  |  | X |  |  | X | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X |  |  |  | X | X |
| **Level 5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA552 | X |  |  | X | X |  |  | X | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X |  |  |  | X | X |
| MA553 | X |  |  | X | X |  |  | X | X | X | X | X | X |  |  |  | X | X | X | X |  | X | X | X |  |  |  | X | X |
| MA629 | X |  | X | X | X |  |  | X | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X |  |  |  | X | X |
| MA564 | X |  |  |  | X |  |  | X | X | X | X | X | X |  |  |  | X | X | X | X |  | X | X | X |  | X |  | X | X |
| MA565 | X |  |  |  | X |  |  | X | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X |  | X |  | X | X |
| MA588 | X |  | X | X | X |  |  | X | X | X | X | X | X |  |  |  | X | X | X | X |  | X | X | X |  | X |  | X | X |
| **Level 6** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA569 | X | X | X | X | X | X |  | X | X | X | X | X | X | X |  |  | X | X | X | X |  | X | X | X | X | X | X | X | X |
| **Level 7** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA578\* | X | X | X | X | X | X |  | X | X | X | X | X | X | X | X |  | X | X | X | X |  | X | X | X | X | X |  | X | X |
| Students take at least two of MA564, MA565 and MA588 | | | | | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |