**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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| **BSc (Hons) Mathematics****BSc (Hons) Mathematics with a Year in Industry** |

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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 & Actuarial Science |
| 1. **Teaching Site**
 | Canterbury  |
| 1. **Mode of Delivery**
 | Full-time |
| 1. **Programme accredited by**
 | Institute of Mathematics and Its Applications |
| 1. **a) Final Award**
 | BSc (Hons)  |
| 7. **b) Alternative Exit Awards**  | BSc (non hons) Mathematics; BSc (non hons) Mathematics with a Year in Industry; Diploma in MathematicsDiploma in Mathematics with a Year in Industry; Certificate in Mathematics |
| 1. **Programme**
 | Mathematics, Mathematics with a Year in Industry |
| 1. **UCAS Code (or other code)**
 | G100, G104 |
| 1. **Credits/ECTS Value**
 | 360 credits (ECTS 180); 480 (ECTS 240) with a year in industry |
| 1. **Study Level**
 | Undergraduate |
| 1. **Relevant QAA subject benchmarking group(s)**
 | Mathematics, Statistics & Operational Research (2015) |
| 1. **Date of creation/revision**
 | Aug 2016/revised FSO Dec 2017  |
| 1. **Intended Start Date of Delivery of this Programme**
 | September 2018 |

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| 1. **Educational Aims of the Programme**

The programme aims to: |
| * Equip students with the technical appreciation, skills and knowledge appropriate to graduates in Mathematics.
* Develop students’ facilities of rigorous reasoning and precise expression.
* Develop students’ capabilities to formulate and solve mathematical problems.
* Develop in students appreciation of recent developments in Mathematics, and of the links between the theory of Mathematics and its practical application.
* Develop in students a logical, mathematical approach to solving problems.
* Develop in students an enhanced capacity for independent thought and work.
* Ensure students are competent in the use of information technology, and are familiar with computers, together with the relevant software.
* Provide students with opportunities to study advanced topics in Mathematics, engage in research at some level, and develop communication and personal skills.
* For the programme involving a year in industry, to enable students to gain awareness of the application of technical concepts in the workplace.
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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 (2015). |

**A. Knowledge and Understanding of:**

1. Core mathematical understanding in the principles of calculus, algebra, mathematical methods, discrete mathematics, analysis and linear algebra. (SB3.8)

2. Statistical understanding in the subjects of probability and inference. (SB3.8)

3. Information technology skills as relevant to mathematicians. (SB3.16)

4. Methods and techniques of mathematics. (SB3.7)

5. The role of logical mathematical argument and deductive reasoning. (SB3.12, SB3.13)

Outcome specific to the Year in Industry programme

6. Aspects of the core subject areas from the perspective of a commercial or industrial organisation.

**Skills and Other Attributes**

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

1. Ability to demonstrate a reasonable understanding of the basic body of knowledge for Mathematics.
2. Ability to demonstrate a reasonable level of skill in calculation and manipulation of the material written within the programme and some capability to solve problems formulated within it.
3. Ability to apply a range of core concepts and principles in well-defined contexts relevant to mathematics.
4. Ability to use logical argument.
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.

Outcome specific to the Year in Industry programme

1. Use of the intellectual skills specified for the programme in the context of a commercial or industrial organisation.

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

1. Ability to demonstrate knowledge of key 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 their mathematical arguments and the conclusions from them with clarity and accuracy.

Outcome specific to the Year in Industry programme

1. Application of some of the subject-specific skills specified for the programme from the perspective of a commercial or industrial organisation.

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

1. Problem-solving skills, relating to qualitative and quantitative information.
2. Communication skills, covering both written and oral communication.
3. Numeracy and computational skills.
4. Information technology skills such as word-processing, internet communication, etc.
5. Personal and interpersonal skills, work as a member of a team.
6. Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working.
7. Study skills needed for continuing professional development.

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

Teaching/learning: Lectures given by a wide variety of teachers; example classes; workshops, computer laboratory classes; tutorials; skills modules; research projects; year in industry (when taken).

Assessment: Coursework involving problems, computer assignments, project reports, presentations; written unseen examinations. Year in Industry - supervisor evaluation, report/poster/reflective pieces.

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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 BA/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****BSc**: This programme is studied over three years full-time. The programme is divided into three 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 degree students must obtain 360 credits (480 including Placement Year), at least 210 of which must be at Level 5 or above, including at least 90 credits at level 6 or above at Stage 3.Students successfully completing Stage 1 of the 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 successfully completing Stage 1 and Stage 2 of the programme and meeting Credit Framework requirements who do not successfully complete Stage 3 will be eligible for the award of the Diploma in Mathematics. Students successfully completing Stage 2 of the programme and achieving 300 credits overall including at least 60 credits at level 6 or above in Stage 3 and meeting Credit Framework requirements will be eligible for the award of a BSc non-honours degree.Students successfully completing Stage 2 and also the placement year and meeting credit framework requirements will be eligible for the award of the Diploma with a Year in Industry*.*For further information refer to the Credit Framework at <https://www.kent.ac.uk/teaching/qa/credit-framework/creditinfo.html#exit-awards>. 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. 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 <http://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. BSc with a year in industry: This programme is as above, but is studied over four years full-time, with the third year spent on an industrial placement. The industrial year comprises 120 credits and overall students must achieve 480 credits in order to qualify for this version of the award. * Module MAST5801 cannot be trailed, compensated or condoned for the BSc with a year in industry. A single attempt only is permitted.
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| **KV Code** | **Code** | **Title** | **Level** | **Credits** | **Term(s)** |
| **Stage 1** |
| **Compulsory Modules** |
| MAST4006 | MA348 | Mathematical methods 1 | 4 | 15 | 1 |
| MAST4007 | MA349 | Mathematical methods 2 | 4 | 15 | 2 |
| MAST4009 | MA351 | Probability | 4 | 15 | 1 |
| MAST4011 | MA306 | Statistics | 4 | 15 | 2 |
| MAST4010 | MA352 | Real analysis 1 | 4 | 15 | 1 |
| MAST4001 | MA343 | Algebraic methods | 4 | 15 | 1 |
| MAST4004 | MA346 | Linear algebra | 4 | 15 | 2 |
| MAST4002 | MA344 | Applications of mathematics | 4 | 15 | 2 |
| **Stage 2** |
| **Compulsory Modules** |
| MAST5013 | MA5513 | Real analysis 2 | 5 | 15 | 1 |
| MAST5005 | MA5505 | Linear partial differential equations | 5 | 15 | 1 |
| MAST5003 | MA5503 | Groups and symmetries | 5 | 15 | 1 |
| **Optional Modules** Students must select 75 credits from the following. |
| MAST5009 | MA5509 | Numerical methods | 5 | 15 | 2 |
| MAST5007 | MA5507 | Mathematical statistics | 5 | 15 | 1 |
| MAST5660 | MA566 | Number theory | 5 | 15 | 1 |
| MAST5012 | MA5512 | Ordinary differential equations | 5 | 15 | 2 |
| MAST5014 | MA5514 | Rings and fields | 5 | 15 | 2 |
| MAST5002 | MA5502 | Curves and surfaces | 5 | 15 | 2 |
| MAST5004 | MA5504 | Lagrangian and Hamiltonian dynamics | 5 | 15 | 2 |
| MAST5001 | MA5501 | Applied statistical modelling 1 | 5 | 15 | 2 |
| **Stage S** |
| **Compulsory Modules** |
| MAST5801 | MA5801 | Industrial placement experience | 5 | 90 | 1,2&3 |
| MAST5802 | MA5802 | Industrial placement (report and presentation) | 5 | 30 | 1,2&3 |
| **Stage 3** |
| **Optional Modules** Students may select up to 60 credits from the following. Availability of modules on the list will depend on whether appropriate pre-requisite and co-requisite modules have been taken. |
| MAST6360 | MA636 | Stochastic processes | 6 | 15 | 1 |
| MAST6390 | MA639 | Time series modelling and simulation | 6 | 15 | 2 |
| MAST6029 | MA6529 | Statistical learning | 6 | 15 | 2 |
| MAST6028 | MA6528 | Principles of data collection | 6 | 15 | 1 |
| MAST6012 | MA6512 | Applied statistical modelling 2 | 6 | 15 | 2 |
| MAST7710 | MA771  | Computational statistics | 6 | 15 | 2 |
| MAST5380 | MA538 | Applied Bayesian modelling | 6 | 15 | 1 |
| **Optional Modules** Students must select from the following to obtain a total of 120 credits. Availability of modules on the list will depend on whether appropriate pre-requisite and co-requisite modules have been taken and on whether the module is available. Scheduling of particular modules in autumn or spring term where indicated as ‘1 or 2’ will ensure a reasonable balance across terms for those modules that are offered. For further information, refer to the handbook. |
| **The modules below will run every year** |
| MAST6017 | MA6517 | Functions of a complex variable | 6 | 15 | 1 |
| MAST5870 | MA587 | Numerical solution of differential equations | 6 | 15 | 1 |
| MAST6018 | MA6518 | Games and strategy | 6 | 15 | 2 |
| MAST6002 | MA691 | Linear and nonlinear waves | 6 | 15 | 1 |
| MAST5740 | MA574 | Polynomials in several variables | 6 | 15 | 1 |
| MAST5670 | MA567 | Topology | 6 | 15 | 1 |
| MAST6703MAST6704 | MA6503MA6504 | ***A student may select either:*** Communicating mathematics ***or*** Discovering and Communicating Mathematics | 66 | 1530 | 11&2 |
| MAST6091 |  | Mathematics in the World of Finance | 6 | 15 | 1 |
| **One of the two modules below will run each year** |
| MAST6044 | MA6544 | Nonlinear systems and applications | 6 | 15 | 2 |
| MAST5680 | MA568 | Orthogonal polynomials and special functions | 6 | 15 | 2 |
| **One of the two modules below will run each year** |
| MAST5490 | MA549 | Discrete mathematics | 6 | 15 | 2 |
| MAST5950 | MA595 | Graphs and combinatorics | 6 | 15 | 2 |
| **The indicative list of modules below will run to provide a balanced programme with adequate choice.** |
| MAST5760 | MA576 | Groups and representations | 6 | 15 | 1 or 2 |
| MAST6004 | MA607 | Quantum mechanics | 6 | 15 | 1 or 2 |
| MAST6005 | MA692 | Operators and matrices | 6 | 15 | 1 or 2 |
| MAST6001 | MA690 | Symmetry methods for differential equations | 6 | 15 | 1 |
| MAST6022 | MA6522 | Integrable systems | 6 | 15 | 2 |
| MAST6021 |  | Groups, knots and fields | 6 | 15 | 1 or 2 |
| MAST6016 | MA6516 | Fluid dynamics | 6 | 15 | 2 |
| MAST6023 | MA6523 | Mathematics for music | 6 | 15 | 1 or 2 |
| MAST6024 | MA6524 | Metric and normed spaces | 6 | 15 | 1 or 2 |
| MAST6170 | MA617 | Asymptotics and perturbation methods | 6 | 15 | 1 |

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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.  |
| The BSc (Hons) in Mathematics with a Year in Industry has the same structure as the BSc (Hons) in Mathematics with the addition of the work-based learning (WBL) placement year between Stage 2 and the final Stage, represented by the modules MAST5801 and MAST5802. For the purposes of honours classification module MAST5801 is assessed on a pass/fail basis. The remaining module, MAST5802, provides a mark for the year in industry, which has weight 10%, Stage 2 has weight 35% and the final year 55%. MAST5801 cannot be compensated, trailed or condoned; a single attempt only is permitted. Where a student does not complete this module, he/she will be transferred to the equivalent non-Year in Industry programme, and the Year in Industry will not be taken into account for the purposes of calculating the honours classification.WBL placements can take place anywhere in the world, although the vast majority take place in the UK. The onus is on students to secure WBL placements, however SMSAS and CES provide support to facilitate this.The WBL is assessed as specified in the module specifications for MAST5801 and MAST5802. The University, with reference to the employer’s evaluation, determines whether the student has passed MAST5801. Students are supported by the SMSAS Placements Officer, who provides a wide range of information and advice to help students determine whether a placement year is suitable, and to help them find suitable roles.During the placement, a member of the module team provides ongoing support and advice, including telephone updates, and generally, for placements in the UK, at least one on-site visit. |

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| **19 Support for Students and their Learning** |
| * School and University induction programme
* Programme/module handbooks
* Library services <http://www.kent.ac.uk/library/>
* Student Support <http://www.kent.ac.uk/studentsupport/>
* Student Wellbeing [www.kent.ac.uk/studentwellbeing/](http://www.kent.ac.uk/studentwellbeing/)
* Centre for English and World Languages <http://www.kent.ac.uk/cewl/index.html>
* Student Learning Advisory Service <http://www.kent.ac.uk/uelt/about/slas.html>
* PASS system <https://www.kent.ac.uk/teaching/qa/codes/taught/annexg.html>
* Academic Adviser system <https://www.kent.ac.uk/teaching/advisers/index.html>
* Kent Union [www.kentunion.co.uk/](http://www.kentunion.co.uk/)
* Careers and Employability Services [www.kent.ac.uk/ces/](http://www.kent.ac.uk/ces/)
* Counselling Service https://www.kent.ac.uk/studentwellbeing/counselling/
* Information Services (computing and library services) [www.kent.ac.uk/is/](http://www.kent.ac.uk/is/)
* Undergraduate student representation at School, Faculty and Institutional levels
* International Recruitment Office <https://www.kent.ac.uk/internationalstudent/>; International Partnerships Office <https://www.kent.ac.uk/global/partnerships/>
* Medical Centre <https://www.kent.ac.uk/studentwellbeing/medicalcentre.html>
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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 programme begins. There is no upper age limit. |
| 20.1 **Entry Route**For current information, please refer to the University prospectus |
| A level AAB including Mathematics grade A (not Use of Mathematics). Only one of General Studies or Critical Thinking can count as a third A level. Access to HE Diploma The University will not necessarily make conditional offers to all Access candidates but will continue to assess them on an individual basis. If we make you an offer, you will need to obtain/pass the overall Access to Higher Education Diploma and may also be required to obtain a proportion of the total level 3 credits and/or credits in particular subjects at merit grade or above. BTEC Level 3 Extended Diploma (formerly BTEC National Diploma) The University will consider applicants holding BTEC National Diploma and Extended National Diploma Qualifications (QCF; NQF; OCR) on a case-by-case basis. Please contact us for further advice on your individual circumstances. International Baccalaureate 34 points overall or 17 points at HL including Mathematics 6 at HL |
| 20.2 **What does this programme have to offer?** |
| * An excellent grounding in Mathematics at university level.
* The opportunity to see the applications of Mathematics in a variety of areas.
* The opportunity to study the subject within a friendly and highly successful department.
* The development of skills which are widely recognised as of great value to employers, and which open up a wide variety of careers.
* For the programme with a year in industry, the opportunity to spend a year on a relevant placement.
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| 20.3 **Personal Profile** |
| * A keen interest in Mathematics
* An appreciation of the importance of the subject in the modern world
* An interest in learning about the range of real-life applications of the mathematical sciences
* A desire to develop quantitative 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 <http://www.kent.ac.uk/teaching/qa/codes/taught/annexe.html>
* External Examiners system <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 <http://www.qaa.ac.uk/InstitutionReports/types-of-review/higher-education-review/Pages/default.aspx>
* Active staff development programme
* Continuous monitoring of student progress and attendance
* Vetting process of examination questions by module team
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| 21.2 **Committees with responsibility for monitoring and evaluating quality and standards** |
| * Staff-Student Liaison Committee
* School Education Committee
* Faculty Education Committee
* Faculty Board
* Education Board
* Board of Examiners
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| 21.3 **Mechanisms for gaining student feedback on the quality of teaching and their learning experience** |
| * Student module evaluations
* Staff-Student Liaison Committee
* Student rep system (School, Faculty and Institutional level)
* Annual NSS
* Discussions with Academic Advisers
* Discussions with Senior Tutor
* Informal meetings and social contact with students (including student role in recruitment activities)
* Staff have office hours when students can discuss their modules/programmes
 |
| 21.4 **Staff Development priorities include:** |
| * PGCHE requirements
* HEA (associate) fellowship membership
* Annual appraisals
* Institutional Level Staff Development Programme
* Academic Practice Provision (PGCHE, other development opportunities)
* Professional body membership and requirements
* Programme team meetings
* Research seminars
* Conferences
* Study leave
* Equality, Diversity and Inclusivity (EDI) awareness
* Research-led teaching
* Links with other European institutions
* Regular formal and informal collaboration in programme development
* Staff supervision
* Minimum expected qualifications for appointments to lecturing posts
* Minimum expected research record for appointments to lecturing posts
* Mentoring of new lecturers
* Attendance at national/international subject symposia
* Widening participation
* Health and safety
* Interaction with National Learning and Teaching Network for Mathematics and Statistics
* Self-evaluation
* Dissemination of good practice on new learning and teaching methods
* Current professional practice in the field
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| 22 **Indicators of Quality and Standards** |
| * Results of periodic programme review March 2017
* Professional accreditation by Institute of Mathematics and Its Applications
* QAA Higher Education Review 2015
* Annual External Examiner reports
* Annual programme and module monitoring reports
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| 22.1 **The following reference points were used in creating these specifications:** |
| * QAA UK Quality Code for Higher Education http://www.qaa.ac.uk/assuring-standards-and-quality
* QAA Benchmarking statement for Mathematics, Statistics & Operational Research (2015)
* Accreditation Requirements of Institute of Mathematics and Its Applications
* School and Faculty plan
* School and Faculty plan
* University Plan <https://www.kent.ac.uk/about/plan/> and Learning and Teaching Strategies https://www.kent.ac.uk/uelt/strategies/lta.html
* Staff research activities
* Kent Inclusive Practices (<https://www.kent.ac.uk/studentsupport/accessibility/inclusive-practice.html>)
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| 23 **Inclusive Programme Design**  |
| The School recognises and has embedded the expectations of current equality legislation, by ensuring that the programme is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services. |

*Template last updated November 2017*

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| **BSc Mathematics****Learning Outcome by Module** |
| **Level and module** | **A: Knowledge and Understanding** | **B: Intellectual skills** | **C: Subject-specific skills** | **D: Transferable skills** |
| **Level 4** |  | **A1** | **A2** | **A3** | **A4** | **A5** | **A6** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **B8** | **C1** | **C2** | **C3** | **C4** | **C5** | **D1** | **D2** | **D3** | **D4** | **D5** | **D6** | **D7** |
| MAST4006 | Mathematical methods 1 | X |   | X | X |   |   | X | X | X |   | X | X |   |   | X | X | X | X |   | X | X | X | X |   | X |   |
| MAST4007 | Mathematical methods 2 | X |   | X | X |   |   | X | X | X |   | X | X |   |   | X | X | X | X |   | X | X | X | X |   | X |   |
| MAST4009 | Probability |   | X |   | X |   |   | X | X | X |   | X |   |   |   | X | X |   | X |   | X | X | X | X |   | X |   |
| MAST4011 | Statistics |   | X | X | X |   |   | X | X | X |   | X | X |   |   | X | X | X | X |   | X | X | X | X | X | X |   |
| MAST4010 | Real analysis 1 | X |   |   |   | X |   | X | X | X | X |   |   |   |   | X | X |   | X |   | X | X | X | X |   | X |   |
| MAST4001 | Algebraic methods | X |   | X | X | X |   | X | X | X | X | X | X |   |   | X | X | X | X |   | X | X | X | X |   | X |   |
| MAST4004 | Linear algebra | X |   | X |   | X |   | X | X | X | X |   | X |   |   | X | X | X | X |   | X | X | X | X | X | X |   |
| MAST4002 | Applications of mathematics | X |   |   |   |   |   | X | X | X |   | X |   |   |   | X | X |   | X |   | X | X | X | X |   | X |   |
| **Level 5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MAST5013 | Real analysis 2 | X |   |   |   | X |   | X | X | X | X |   |   |   |   | X | X |   | X |   | X | X | X | X |   | X |   |
| MAST5005 | Linear partial differential equations | X |   |   | X |   |   | X | X | X |   | X |   |   |   | X | X |   | X |   | X | X | X | X |   | X |   |
| MAST5003 | Groups and symmetries | X |   |   |   | X |   | X | X | X | X |   |   |   |   | X | X |   | X |   | X | X | X | X |   | X |   |
| MAST5009 | Numerical methods | X |  | X | X |  |  | X | X | X |  | X | X |  |  | X | X | X | X |  | X | X | X | X |  | X |  |
| MAST5007 | Mathematical statistics |  | X |  | X |  |  | X | X | X |  | X |  |  |  | X | X |  | X |  | X | X | X | X |  | X |  |
| MAST5660 | Number theory | X |  |  |  | X |  | X | X | X | X | X |  |  |  | X | X |  | X |  | X | X | X | X |  | X |  |
| MAST5012 | Ordinary differential equations | X |  | X | X |  |  | X | X | X |  | X | X |  |  | X | X | X | X |  | X | X | X | X |  | X |  |
| MAST5014 | Rings and fields | X |  |  |  | X |  | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X | X |  | X |  |
| MAST5002 | Curves and surfaces | X |  |  |  | X |  | X | X | X | X |  |  |  |  | X | X |  | X |  | X | X | X | X |  | X |  |
| MAST5004 | Lagrangian and Hamiltonian dynamics | X |  |  |  |  |  | X | X | X |  | X |  |  |  | X | X |  | X |  | X | X | X | X |  | X |  |
| MAST5001 | Applied statistical modelling 1 |  | X | X | X |  |  | X | X | X |  | X | X |  |  | X | X | X | X |  | X | X | X | X |  | X |  |
| MAST5801 | Industrial placement experience |  |  |  |  |  | X | X | X |  |  |  |  |  | X | X | X |  | X | X | X | X | X | X |  | X | X |
| MAST5802 | Industrial placement (report and presentation) |  |  |  |  | X | X | X |  |  |  |  |  | X | X | X |  | X | X | X | X | X | X |  | X | X |
| **Level 6** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MAST6017 | Functions of a complex variable | X |  |  | X | X |  | X | X | X | X | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST5870 | Numerical solution of differential equations | X |  | X | X |  |  | X | X | X |  | X | X | X |  | X | X | X | X |  | X | X | X | X |  | X | X |
| MAST6018 | Games and strategy | X |  |  |  |  |  | X | X | X |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6002 | Linear and nonlinear waves |  |  | X |  |  |  | X | X |  |  | X | X | X |  | X | X | X | X |  | X | X | X | X |  | X | X |
| MAST5740 | Polynomials in several variables |  |  |  |  | X |  | X | X |  | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST5670 | Topology | X |  |  |  | X |  | X | X | X | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6044 | Nonlinear systems and applications |  |  |  | X |  |  | X | X |  |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST5680 | Orthogonal polynomials and special functions |  |  | X |  |  | X | X |  |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST5490 | Discrete mathematics | X |  |  |  | X |  | X | X | X | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST5950 | Graphs and combinatorics | X |  |  |  | X |  | X | X | X | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST5760 | Groups and representations |  |  |  |  | X |  | X | X |  | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6004 | Quantum mechanics | X |  |  |  |  |  | X | X | X |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6005 | Operators and matrices |  |  |  |  | X |  | X | X |  | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6001 | Symmetry methods for differential equations |  |  | X |  |  | X | X |  |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6022 | Integrable systems | X |  |  |  |  |  | X | X | X |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6021 | Groups, knots and fields |  |  |  |  | X |  | X | X |  | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6016 | Fluid dynamics | X |  |  |  |  |  | X | X | X |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6023 | Mathematics for music |  |  |  | X |  |  | X | X |  |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6024 | Metric and normed spaces |  |  |  |  | X |  | X | X |  | X |  |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6170 | Asymptotics and perturbation methods |  |  |  | X |  |  | X | X |  |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6091 | Mathematics in the World of Finance |  |  |  | X |  |  | X | X | X |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6703 | Communicating mathematics |   |   | X |   |   |   | X | X |   |   |   | X | X |   | X | X | X | X |   | X | X | X | X |   | X | X |
| MAST6704 | Discovering and Communicating Mathematics |   |   | X |   |   |   | X | X |   |   |   | X | X |   | X | X | X | X |   | X | X | X | X |   | X | X |
| MAST6360 | Stochastic processes |  | X |  | X |  |  | X | X | X |  | X |  | X |  | X | X |  | X |  | X | X | X | X |  | X | X |
| MAST6390 | Time series modelling and simulation |  | X | X | X |  |  | X | X | X |  | X | X | X |  | X | X | X | X |  | X | X | X | X |  | X | X |
| MAST6029 | Statistical learning |  | X | X | X |  |  | X | X | X |  | X | X | X |  | X | X | X | X |  | X | X | X | X |  | X | X |
| MAST6028 | Principles of data collection |  | X | X | X |  |  | X | X | X |  | X | X | X |  | X | X | X | X |  | X | X | X | X |  | X | X |
| MAST6012 | Applied statistical modelling 2 |  | X | X | X |  |  | X | X | X |  | X | X | X |  | X | X | X | X |  | X | X | X | X | X | X | X |
| MAST7710 | Computational statistics |  | X | X | X |  |  | X | X | X |  | X | X | X |  | X | X | X | X |  | X | X | X | X |  | X | X |
| MAST5380 | Applied Bayesian modelling |  | X | X | X |  |  | X | X | X |  | X | X | X |  | X | X | X | X |  | X | X | X | X |  | X | X |