

Programme Specification 2016-17

PART III OF THE MATHEMATICAL TRIPOS Master of Mathematics (MMath) Master of Advanced Studies in Mathematics (MASt.)

1 Awarding body	University of Cambridge
2 Teaching institution	Faculty of Mathematics
3 Accreditation details	None
4 Name of final award	Master of Mathematics or Master of Advanced Studies in Mathematics (for students new to Cambridge)
5 Programme title	Mathematical Tripos Part III
6 JACS code(s)	G120, G110, G100
7 Relevant QAA benchmark statement(s)	Mathematics, Statistics and Operational Research
8 Qualifications framework level	7 (Masters)
9 Date specification was produced	March 2016

Aims and Objectives

The Master in Mathematics (MMath) for students continuing their studies, and Master of Advanced Studies in Mathematics (MASt.) for students new to Cambridge is also known as 'Part III of the Mathematical Tripos'. It is a one-year taught Master's course in mathematics and is excellent preparation for mathematical research and it is also a valuable course in mathematics and in its applications for those who want further training before taking posts in industry, teaching, or research establishments.

The aims of the Faculty for Part III of the Mathematical Tripos are:

- to provide a challenging and interesting course in mathematics and its applications for a range of students that include some of the best both in this country and the world;
- to provide a course which whilst mainly aimed at students preparing to do research can be useful to appropriate students going into other careers;
- to give students a background which will enable them to make an appropriate choice of research subject and to prepare them for research in that subject;
- to provide an integrated system of teaching which can be tailored to the needs of individual students;
- to develop in students the capacity to follow and to expound long and complex mathematical arguments;
- to continue to attract outstanding students from all over the world;
- to produce high calibre students with skills sought after by leading graduate schools and businesses throughout the world;
- to provide an intellectually stimulating environment in which future leading mathematicians from many countries can have the opportunity to develop their talents and enthusiasm together to their full potential;
- to maintain and extend the position of Cambridge as a leading international centre for research and teaching in mathematics.

The objectives of Part III of the Mathematical Tripos are such that after completing the course, students should:

- have a good background in their chosen field;

- be well on the way to becoming independent learners, expositors and thinkers.

Students will be expected to have:

- Studied advanced material in the mathematical sciences to a level not normally covered in a first degree;
- Further developed the capacity for independent study of mathematics and problem solving at a higher level;
- Undertaken (in most cases) an extended essay normally chosen from a list covering a wide range of topics.

Transferable Skills

At Cambridge, as at any institution of higher education, mathematical skills are highly transferable. The courses arranged by the Statistical Laboratory are perhaps the most immediately transferable, but mathematics underpins all the Natural Sciences, Computer Science, Engineering, Economics, Business and Management Studies and a whole range of industrial and commercial processes and enterprises.

In a wider context, the problem solving skills students gain are also highly applicable to challenges outside of mathematics. Students learn how to immerse themselves into difficult new subject areas, find the important points and structure their learning in an efficient way.

In addition to transferable skills acquired as a consequence of the course, Part III students also receive talks on subjects such as how to prepare a talk, how to read a mathematical paper, and how to write a mathematical essay.

Learning, Teaching and Assessment Methods

The structure of Part III is such that students prepare between six and nine lecture courses for examination. These lecture courses may be selected from the wide range offered by both Mathematics Departments, the Department of Pure Mathematics and Mathematical Statistics (DPMMS), or the Department of Applied Mathematics and Theoretical Physics (DAMTP). As an alternative to one lecture course, an essay may be submitted.

General relevant material is covered in the Guide to Courses. This guide is updated annually and provides descriptions and information about all the Part III lecture courses offered in any given year. The Faculty publishes a full list of the courses available annually in the *Reporter*.

Every Part III student must formally register with either DPMMS or DAMTP at the start of the academic year. They may, however, take courses offered by either Department irrespective of their registration and are advised to register with the Department which most closely aligns with their academic interests (i.e. the Department which offers the majority of courses that the student intends to take). If a student finds the balance of his/her choice of courses changes it is possible, though not essential, to change registration.

Part III students take lecture courses, consisting of 24 lectures or of 16 lectures. Each course takes place in one of the three terms. Examinations for all courses take place in the second half of the Easter term.

Lectures are given over an eight week period in each of the Michaelmas and Lent terms and over a four week period in the Easter term. Lectures take place every day except Sunday and are held at the Centre for Mathematical Sciences (CMS).

There are no requirements that students restrict their choices of courses to those given by

one Department. Most students take courses from a small number of subject areas, but some take a wide variety. Courses may be selected freely from those available, within constraint of the Lecture timetable, which is arranged carefully to avoid, as far as possible, clashes between related courses.

Lectures proceed at a brisk rate, and a complete understanding of the material during lectures is not expected. Students should try to appreciate the general outline of the material during lectures, and then work through the details afterwards. The depth of understanding in Part III is greater than in earlier parts of the Mathematical Tripos or most undergraduate mathematics or physics degree courses elsewhere.

The examinations are held at CMS over a two-week period in the Easter term. There is no continuous assessment. Each lecture course has its own examination paper, normally set and marked by the lecturer. However, the examinations are overseen by a group of Examiners who are formally independent from those giving the lecture courses.

In place of one three hour examination paper, students may submit an essay written during the year. A list of approved essay titles is announced towards the end of the Michaelmas term.

Courses are worth either two or three credit units depending on whether they last for 16 or 24 lectures respectively. Candidates for Part III may offer a maximum of 19 credit units for examination. In the past it has been recommended that candidates offer between 17 and 19 units. An essay (should a candidate choose to submit one) counts for 3 credit units. Part III is graded Distinction, Merit, Pass or Fail. A Merit or above is the equivalent of a First Class in other Parts of the Mathematical Tripos.

Support for Students and their Learning

The Faculty produces an annual Guide to Courses for all students and also provides information from the Faculty office and on the Faculty website.

Students have access to appropriate textbooks and other materials through the University and College libraries and computing facilities.

Students are assigned a Director of Studies and, in some cases, a personal Tutor by their College.

Support for lecture courses is normally provided in the form of examples classes. Students offering an essay may consult their essay supervisor during the course of preparation and submission.

A series of talks inform students about topics such as PhD applications, available Careers support, specifics about exams, preparing talks, reading research papers and writing mathematical essays.

Throughout the year students are also supported in a variety of more informal ways by academic staff and PhD students. There are usually some workshops at the start of the academic year which facilitate incoming students from a large variety of backgrounds to be aware of and if necessary catch up with required pre-requisites for Part III courses in various areas. There are several opportunities for students to seek help on specific lecture content from PhD students informally. Students are strongly encouraged to support each other in their learning through Study Groups. In special cases and with the agreement of a student's College, individual or small-group supervisions can be arranged for more

continued support.

Criteria for Admission

Non-Cambridge graduates (MASt.) are normally required to have at least a first class honours degree in mathematics, physics, statistics or engineering, or an equivalent qualification with significant advanced mathematical content. Candidates continuing from the Cambridge Mathematical Tripos (M.Math) are normally required to have obtained first class honours.

Management of teaching quality and standards

Each Part III student has a member of academic staff as their departmental contact. There is a meeting between student and departmental contact in each of the Michaelmas and Lent Terms to monitor progress. A written report of each meeting is sent to the Part III Course Director and to the Director of Studies of the student's College. Students also have termly meetings with their College Tutor and/or Director of Studies to monitor and review their progress in the Tripos.

The Faculty has a Part III Committee, which regularly reviews the syllabus and content of this part of the Tripos, student feedback and comments from examiners. Students have representation on this Committee. The Chair of the Part III Committee is normally on the Faculty Board and is normally invited to the Directors of Studies twice yearly meetings for items involving Part III.

All Parts of the Tripos have External Examiners, who are required to submit a report to the University. The External Examiners' reports for Part III are responded to by the Faculty Board in consultation with the Part III Committee. The report and response is scrutinised by the General Board's Education Committee.

The Faculty undertakes a reflective, centrally-coordinated review by the General Board once every six years, and completes yearly Annual Quality Updates to assist in dissemination of good practice.

Graduate Employability and Career Destinations

The Careers Service maintains links with relevant employers and takes into account employer needs and opinions in the services which it provides for students. The Careers Service also allocates a Careers Adviser to each College, Faculty and Department to act as a point of contact.

Every effort has been made to ensure the accuracy of the information in this programme specification. At the time of publication, the programme specification has been approved by the relevant Faculty Board (or equivalent). Programme specifications are reviewed annually, however, during the course of the academical year, any approved changes to the programme will be communicated to enrolled students through email notification or publication in the Reporter. The relevant faculty or department will endeavour to update the programme specification accordingly, and prior to the start of the next academical year.

Further information about specifications and an archive of programme specifications for all awards of the University is available online at: www.admin.cam.ac.uk/univ/camdata/archive.html