

Mathematical Tripos
Part III
2011 – 2012

Part III Handbook



The Faulkes Institute for Geometry, completed in January 2002

PART III HANDBOOK 2010-2011

*This handbook has been compiled by the Part III Course Directors,
Malcolm Perry (DAMTP) and Imre Leader (DPMMS).*

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1 INTRODUCTION

Welcome to Part III of the Mathematical Tripos

This handbook gives all the information needed by most students taking Part III, apart from information on specific courses, which is given in the separate booklet *Guide to Courses*. Every student taking Part III should have their own copy of *Part III Handbook* and *Guide to Courses*, both are also available on the web.

<http://www.maths.cam.ac.uk/postgrad/casm/partiiihandbook.pdf>

<http://www.maths.cam.ac.uk/postgrad/casm/descriptions.pdf>

They should also have received a copy of *Notes for New Part III Students*, describing beginning-of-year arrangements.

<http://www.maths.cam.ac.uk/postgrad/casm/notes/>

Part III students take lecture courses, either 24 lectures (called 3-unit courses) or 16 lectures (called 2-unit courses). Each course takes place in one of the three terms (Michaelmas, Lent, Easter). Examinations for all courses take place in the second half of the Easter term. Each student may take up to 19 units of courses for examination. Students may also submit an essay for examination credit. This counts as 3 units and is in place of a 3 unit lecture course. For more details see Sections 3, 4 and 5 below.

All official Part III activity takes place at the Centre for Mathematical Sciences (CMS) in Clarkson Road, where there are lecture theatres, a common room and a large Part III room, sometimes called the Dirac Graduate Centre, the latter specifically provided for the use of Part III students. The Part III room contains notice boards on which important information is displayed. For more details of the Part III room and associated facilities see Section 7 below.

There are many people who can offer advice or help to Part III students, either routine or if things go wrong. See sections 8 and 9 below.

Appendix I gives a calendar for Part III. Please note in particular the meetings for Part III students on Wednesday afternoons.

2 ADMINISTRATIVE ARRANGEMENTS AND REGISTRATION

The Part III course is run by the two Departments, DAMTP and DPMMS, which make up the Faculty of Mathematics. DAMTP is the Department of Applied Mathematics and Theoretical Physics. DPMMS is the Department of Pure Mathematics and Mathematical Statistics. The Statistical Laboratory (Statslab for short) is a self-contained part of DPMMS comprising those staff who work on mathematical statistics and probability.

The *Guide to Courses* makes it clear which Department has responsibility for which course. Students may take any combination of courses offered by the two Departments, but each student *must* formally register with one, and only one, Department. If you fail to register you are in administrative limbo and this may have serious consequences. Each Department is formally responsible for the students who have registered with it and, in particular, provides a Departmental Contact who interviews the student twice during the year. It is *obligatory* to attend these interviews.

In each Department there is a Part III Course Director who takes overall responsibility for the course and the students. See sections 10 and 11 below for more details about DAMTP and DPMMS respectively.

3 LECTURES, EXAMPLE CLASSES AND SUPERVISIONS

Lectures

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 are usually in the mornings, and take place every day except Sunday (including Saturday). All Part III lectures will be held at CMS. Each lecture lasts for 50 minutes and starts at five minutes past the hour. *Please be on time.*

Introductory session on Wednesday 5 October
Lectures begin on Thursday 6 October

A timetable of Part III lectures can be found at <http://www.maths.cam.ac.uk/lecturelists/PartIIIWeb.pdf>.

There is no requirement that students restrict their choice 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 the constraints of the lecture timetable, which is arranged carefully to avoid, as far as possible, clashes between related courses. (It is not possible for students to sit examination papers in two courses that were lectured at the same time - see section 5 below.)

Descriptions of all Part III lecture courses are available on the Faculty's web-site <http://www.maths.cam.ac.uk/postgrad/casm/descriptions.pdf> and in the booklet (*Guide to Courses*) which will be distributed at the introductory meeting in October.

Lectures proceed at a brisk rate, and a complete understanding of the material during lectures is not expected. This may be a new experience for some of you. You should try and appreciate the general outline of the material during lectures, and then go home and understand the details. We emphasise that it is very important that you get to grips with the details. Without this understanding you are unlikely either to get a feeling for the overall structure of the ideas, or to appreciate fully the relationships between them. The depth of understanding needed in Part III is greater than in earlier Parts of the Mathematical Tripos or most mathematics or physics degree courses elsewhere.

Further, you should take care to work through your notes soon after each lecture. At the beginning of each new lecture a good understanding of previous lectures will be assumed. Once you fall behind, Part III becomes very much harder.

It is expected that each lecturer will announce times when he or she will be available to help you with any difficulties you have with the lectures. Most lecturers are happy to answer brief questions after lectures.

In exceptional circumstances, the Faculty Board can approve a reading course in addition to the lecture courses. This needs to be proposed by a member of the Faculty who agrees to prepare a syllabus for the course and to examine it. The Faculty Board will only approve such courses where they are convinced that there is a clear and important gap in the range of courses available. If you wish such an additional course to be considered you should contact the Subject Adviser in the

relevant area as soon as possible in the Michaelmas term. All proposals must be submitted to the Faculty Board by the middle of the Michaelmas term. The deadline is given in Appendix I and must be strictly observed.

For more information attend the talk '*Exams and Lectures*'. 1615 Wednesday 19 October, CMS MR2.

Examples Classes

For most of the courses, example sheets are distributed by the lecturer and there are examples classes to help you understand the material. Attending these examples classes are an important part of studying the course and valuable preparation for the examinations.

It is not possible (even supposing that it was desirable) to arrange for the kind of supervisions given to undergraduates and, in general, the arrangements for examples classes are made by the lecturers and not the colleges.

If an examples class is given by someone other than the lecturer, then he or she has to keep an attendance record. At the beginning of each such class you should give your name for the instructor to record. (You should do this even if the instructor is too shy or too disorganised to ask.)

You will gain much more from a class if you

(a) prepare work in advance, (b) think about the course in general before the class and (c) take an active part in the class, but, if you have just come along to listen, please indicate this as well. (The instructors are asked to write a short note about each member of the class. It is clearly unfair to ask them to say anything about purely passive participants.)

Most Part III courses are difficult, even for the lecturer, so instructors may not be able to answer all your questions on the spot. They will probably appreciate an e-mail about any questions you may have in advance of the class. You are encouraged to discuss the lectures with other members of the class both on a formal and informal basis.

Part III is not an easy course. However, experience has shown that if you make the necessary effort and take advantage of the above facilities, then you will find the course both more accessible and more enjoyable. You will also find it easier to retain the details needed for the examination.

4 ESSAYS

In place of a 3 hour examination paper (see Section 5 below) you may submit an essay written during the year. A list of approved essay titles is announced towards the end of the Michaelmas Term. Some titles are clearly associated with Part III lecture courses, some are not. You are allowed both to take a lecture course for examination and to write an essay that is associated with that course. An essay associated with a lecture course is expected to go beyond the material presented in the lectures. A student may request that an additional essay title is set. (Such a request is usually made in co-operation with a suitable member of the academic staff who will act as an assessor.) The deadline for this is given in Appendix I and must be strictly observed.

Details of essay titles will be made available in an essay booklet that will be available on the Part III web pages towards the end of the Michaelmas Term. The booklet will include general guidelines and instructions about writing the essay, including advice concerning plagiarism¹ and the declaration

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See also the University's statement for students available at:

<http://www.admin.cam.ac.uk/offices/gradstud/current/submitted/plagiarism.html>

of any relevant work that you have undertaken before the start of Part III. There is no prescribed length for the essay in the University Ordinances, but the Faculty Board guidance to examiners (see Appendix II) suggests that 5,000-8,000 words is a normal length.

In the past the great majority of Part III students have chosen to write an essay: the work is an enjoyable change and is valuable training for research. For more information attend the talk *'How to write a Part III Essay'* which will be given at 16:15 on Wednesday 16 November in CMS MR2.

Supporting material is available at www.dpmms.cam.ac.uk/~twk/Essay.pdf and at www.atm.damtp.cam.ac.uk/people/mem/lucidity-in-brief.

Many students write their essay during the Easter vacation, though there is no reason why essay writing should not start in the Christmas Vacation or in the Lent Term (although be careful not to spend disproportionately too much time on the essay). Most Colleges will look sympathetically on requests to stay in College accommodation for part of the vacation to work on the essay (since library and computer access will often be easier in Cambridge than at home), though applications to do this should be made well in advance and in many Colleges extra rent will be payable.

5 EXAMINATIONS AND ASSESSMENT

The following guidelines, which cover all of Part III (i.e. both DAMTP and DPMMS), have been drawn up by Chairman of the Part III Committee, in consultation with the Chairman of Examiners. If you need clarification or have questions you are strongly recommended to consult your College Director of Studies or your Departmental contact/interviewer.

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.

Candidates are allowed to offer up to 19 units of credit for the examination. 16-lecture courses have a 2-hour paper, counting as 2 units; 24-lecture courses have a 3-hour paper, counting as 3 units. An examination may be of 'open book' type (meaning that approved lecture notes or similar material may be brought into the examination), in which case the lecturer will announce this before the end of the lecture course. The lecturers may give information on the form of the examination to their lecture class as a whole but, of course, can not give such information on an individual basis. An essay, written during the year, may be submitted and counts as 3 units. (For more details of essays see the previous section.) Each candidate may submit at most one essay.

The examination timetable will be organised according to the lecture timetable, i.e. courses for which lectures are given in the same time slots will also have their examination papers in the same time slot. **It is therefore not possible for a candidate to take two such courses for examination.** At the beginning of Easter Term you will receive a letter from the Chairman of Examiners including a form on which to indicate your choice of examination papers and essay (if appropriate) and information on how examinations are organised.

The final deadline for choice of examination papers and choice of essays is the second Friday of Easter Full Term: this year Friday 4 May 2012. The deadline for submitting essays is the same day, i.e. Friday 4 May 2012, the second Friday of Easter Full Term. The examinations will take place during the period 31 May 2012 to 12 June 2012 (inclusive) although this period is subject to minor change. Results will be announced on Thursday 21 June 2012. Soon after that details of your marks will be available through your College. You will later receive a certificate and transcript, again

through your College. Please contact faculty-office@maths.cam.ac.uk for all Part III essay queries.

The Faculty of Mathematics has approved a document outlining the aims and objectives of Part III, and advising the Examiners on the examinations and the classification of results. This is reproduced in Appendix II. As outlined there, when examination papers are marked each candidate is given a numerical mark and a quality mark on each paper. Essays are marked similarly. The Examiners consider the total marks and the quality marks of each candidate and classify candidates into groups. These are ‘Distinction’, ‘Merit’, ‘Pass’ and ‘Fail’. **Candidates at borderlines between the groups are considered individually and very carefully; decisions are not made by applying a simple formula.** All candidates who obtain a ‘Pass’ or higher are regarded as achieving the ‘Honours’ standard; therefore ‘Pass’ is sometimes called ‘Honours’.

On each paper the numerical mark is a percentage, while quality marks are alpha (highest), beta or gamma (lowest), moderated by plus or minus. An alpha quality mark signifies a performance of Distinction standard, while a beta quality mark signifies a performance of at least Honours standard. (Note that, unlike in Parts IA, IB and II of the Mathematical Tripos, the quality mark is given for the paper, not for individual questions.) Quality marks are particularly important in the classification. For example, some candidates who are not awarded a Distinction may have substantially more total marks than other candidates who have been awarded a Distinction on the basis of having achieved the required level of quality marks.

As a very rough guideline, in 2011 the *approximate* minimum performance to achieve a Distinction was either an average mark per unit¹ of at least 72.5% with at least 10 alpha units², or an average mark per unit of at least 70% with at least 14 alpha units. The *approximate* minimum performance to achieve a Merit was an average mark per unit of at least 60% with at least 10 alpha or beta-plus units. The *approximate* minimum performance to achieve an Honours was an average mark per unit of at least 32% with at least 8 alpha or beta units. The average marks per unit are based on candidates having taken at least 17 units.

While the criteria in 2012 are expected to be similar to those above, it is emphasised that exact criteria for classification vary from year to year and are at the discretion of the Examiners. For instance, the alpha borderline for a distinction is not rigid and in the past the examiners have given distinctions to some candidates with fewer alphas and merits to some candidates with more alphas.

The importance of the quality mark means that it is not necessarily the best strategy to take as many units as possible for examination. Doing fewer units *may* allow you to concentrate on certain courses and therefore obtain higher quality marks in those courses.

In the past almost all candidates who obtained Distinctions or Merits submitted 17-19 units for examination, while candidates who obtained Passes have usually submitted 12-19 units. The Examiners recommend submitting a minimum of 12 units to obtain a Pass. The Faculty Board’s advice to examiners is given in Appendix II.

6 WORK LOAD

In order to balance your workload throughout the year, you are recommended to prepare approximately nine units of lectures for examination in each of the Michaelmas and Lent terms. Of

¹ The average mark per unit is calculated by taking the best papers covering at least 17 units and calculating the average mark per unit on these papers.

² ‘12 alpha units’ means alpha quality mark on 12 units’ worth of material, e.g. alpha quality marks for three 2-unit papers, one 3-unit paper and an essay.

course you are welcome to attend more than this number of lectures, and at the beginning of term you are certainly recommended to start more than nine units of lectures before deciding which courses to concentrate on after two weeks or so. If you intend to write an essay you should be aware that it is very tempting to spend more time on this than an equivalent three unit lecture course. For this reason there may be some advantage in taking slightly more units in Michaelmas term. Most students spend the Easter term preparing for the examination, though there are a limited number of examinable Part III courses given during this term.

7 FACILITIES AT CMS (including Part III Room)

General CMS Information

Safety	The Safety Officer for the CMS site, is the CMS Facilities Manager, Mr M Young tel 66915 email mly20@maths.cam.ac.uk. It is your responsibility to act safely and avoid putting yourself or others at risk. All site occupants should follow safety instructions and inform the Safety Officer of anything causing concern about safety. If you are involved in an accident or observe a dangerous incident or safety risk, either in or outside the buildings or involving equipment, you should summon help. You should also report it, whether or not anyone was injured.	Report accidents, incidents and hazards to Reception on 65000. Outside normal office hours, telephone University Central Security on the emergency number 101 or their regular number 31818, as relevant. A form for reporting Accidents, Dangerous Occurrences and Incidents is available from Reception or you can print one from the University Safety Office website. Please return completed forms to Reception. The emergency number for FIRE, POLICE or AMBULANCE is 1 999 from any University network telephone.
Fire Alarms	Familiarise yourself with entrances, emergency exits and fire-alarm assembly points. If the fire alarm sounds, leave the building by the nearest exit at that level if possible, avoiding stairs if you can and never try to use the lifts. Stay outside until the Fire Wardens allow you to re-enter. You may go into other buildings providing they are not also under alarm.	There will be a short Safety induction at the beginning of the first term, where procedures will be explained in more detail. Fire alarms are tested each Wednesday morning between 8:30 – 9:00 am.
First Aid	In case of accident or illness, there are several First Aiders based on this site. To summon help from a First Aider, telephone Reception on 65000. Contact details and First Aid boxes are also available in Common Rooms.	If a First Aider is required outside normal office hours, telephone University Central Security on the emergency number 101 or the regular number 31818, as relevant.
Security	Access without a proximity card to the Central Core via the main doors near Reception is normally possible on weekdays from 8.20 am to 5.30 pm. A University Card (issued by your College) is needed for all other entrances, and also for most other internal doors including the Part III Room in the evenings and at weekends.	Your card will need activating for the site – take it to Reception. Do not admit people without cards to the buildings. Close manual windows and lock manual doors if you are the last to leave. Always lock the doors behind you on your return from the patio area outside the Part III room. The card has a chip and imbedded loop aerial and may not work if damaged. Keep your card on you at all times and report to Reception or the Facilities Manager if it is lost or damaged.
Telephones	There is a telephone near Reception that is restricted for outgoing calls to within the University network.	A payphone is available in the alcove by Meeting Room 1 opposite Reception. Calls can be made to anywhere except premium

		rate numbers.
Post	In the Reception area, just to the right of the vending machines, there are pigeon holes available for mail to Part III students. Royal Mail, University Messenger Service and courier mail is delivered and collected on weekdays to and from Reception.	Check mailboxes regularly. Ask at Reception for help with outgoing mail.
Smoking policy	Smoking is not allowed in any of the CMS buildings and is actively discouraged near entrances or automatic vents and windows. Please do not smoke in the garden area outside the Part III room or near the bridge between Pavilion B and Central Core.	Ashtrays are provided beneath the cycle shelters around the perimeter of the site and the circular seating areas outside the main entrance to Central Core.

Facilities in the Dirac Graduate Centre (Part III Room) at CMS

TYPE OF FACILITY		
Computer terminals	University Personal Workstations are available for your use (see section 13). Accounts and passwords are administered by the University Computing Service.	Important messages will be sent to your University e-mail address. Make sure you read such messages regularly.
Telephone	Incoming and outgoing calls are restricted to within the University network only.	The extension number is 65243.
Printers	Currently there is no charge for printing but it is monitored by user-ID for serious overuse.	Please report any problems with the printer to the helpline: help@maths.cam.ac.uk.
Photocopier	There is a photocopier available for your use. Currently there is no charge for copying.	Please report any problems with the photocopier to Reception on 65000.
Paper	Spare paper for printers and photocopier is kept alongside the equipment in the Part III room.	Call Reception for more paper. When Reception is closed, limited paper supplies may be taken from BL.20 or B0.01. Please use the recycling bins for used printer paper.
Textbooks	Some books for applied mathematics and theoretical physics are provided but these are NOT to be taken out of the room.	Pure mathematics books are only available from the Moore Library at CMS. Books for statistical sciences are held in Pavilion D.
Notice boards	There are official notices for important deadlines etc, a notice board for jobs/research opportunities, and a separate notice board for items of interest to students from each Department.	Please check notice boards regularly.
Lockers	Lockers are located in the coffee area of the Part III room. Locker keys can be obtained from the accounts office for a deposit of £20 (cash) which will be refunded on return of the key by 30 June.	Lost keys should be reported to the accounts office. A replacement will be provided for a charge.
Refreshments	A Flavia drinks' machine, kettle, microwave, two refrigerators and washing up facilities are provided in the kitchen area. Limited quantities of milk and sugar are provided free of charge. Please do not take	Sachets for Flavia machines are available from Reception. Part III students are also encouraged to use the cafeteria in the Central Core. Please use the recycling bins for glass, plastic bottles and aluminium cans.

	refreshments near the computers.	
Meeting rooms 7 and 8	These rooms, located adjacent to the Part III Room, can be used for studying, seminars or small group meetings.	They can be booked at Reception if necessary.
Past examination papers	Bound copies of Part III examinations for 1998-2011 are provided, but are NOT to be taken out of the room.	Copies are available on http://www.maths.cam.ac.uk/ppa

8 POINTS OF CONTACT: who's who

Director of Studies

Your College *Director of Studies* is there to provide general mathematical advice and to check that you are making adequate progress. You must see him or her at the beginning and end of each term. Your *Departmental Contact* and certain of the examples classes instructors and supervisors will write reports on your progress to your Director of Studies. S/he is one of the people you might ask to write a reference for you. If your funding body needs a report on your progress, your Director of Studies or Tutor is the person to provide it. Your Director of Studies is the person through whom you submit your choice of examination papers and your essay (if you have written one).

Tutor

Your College *Tutor* takes an overview of your time in Cambridge and an interest in all aspects of your well-being. Tutors are at their students' disposal for all administrative and financial matters. S/he too will probably want to see you at the beginning and end of each term and will also receive reports on your progress. Your Tutor may hold an occasional party during the year, but other than that you are unlikely to have contact unless you have problems (at which point s/he will lend a sympathetic ear, respect all information given in confidence and move heaven and earth to help you).

Faculty Secretary (Lectures, Examinations and Essays)

The *Faculty Secretary* is in Room B1.28 at CMS (email: faculty-office@maths.cam.ac.uk). The Faculty Secretary will help you if you have routine questions about lecture timetables, examinations or essays.

General Enquiries

In case of difficulties please email: casm@maths.cam.ac.uk

Departmental Contact

If you have registered with DAMTP, you will be notified who your *Departmental Contact* is towards middle of Michaelmas term by e-mail. If you have registered with DPMMS you will choose one of the *Subject Advisers* to be your Departmental Contact. Your contact will interview you twice during the year in order to check on your progress, although s/he will be happy to chat to you at other times. S/he is one of the people you might ask to write a reference for you.

Subject Advisers

The task of the *Subject Advisers* is to co-ordinate lectures and examples classes in their subjects. They are also good people to approach for subject-specific advice, e.g. which universities are good for which specialities. If they do not know the answer they probably know who will.

Part III Course Directors

The task of the two *Part III Course Directors* is to write these notes, keep records, and ensure that everyone else is doing their job! If no one else can help you then we will. We are happy to be approached at any time. If you have an urgent matter you should come and see us at your earliest convenience.

Part III Committee

There is a *Part III Committee* whose job it is to advise the Faculty Board on the general running of Part III. A list of its members will be posted on the Part III notice board. Suggestions, praise and/or complaints should be communicated to a member of the committee. There will be two postgraduate student representatives on the committee. If you have a suggestion or complaint that you wish the committee to consider you can

1. discuss it with a member of the committee,
2. e-mail the *Faculty hotline* (see below), noting that you want your message to be passed (anonymously) to the Part III Committee.
3. write to the Chairman of the Faculty Board of Mathematics who will pass your letter to the Committee,

Although the Faculty Board (on which there are both undergraduate and graduate student representatives) is the ultimate decision-making body, it will normally send suggestions for changes in Part III to the Part III committee for preliminary discussion.

Faculty Board

There is also a graduate representative on the *Faculty Board of Mathematics*, which is the body ultimately responsible for Part III. The representative maintains a number of pages of useful information on the www. See

<http://www.damtp.cam.ac.uk/user/studrep/>

Faculty Hotline

Comments, complaints or suggestions about Part III can be e-mailed directly to

Hotline@maths.cam.ac.uk

Forms

Modern life involves form filling and Part III is no exception. Here is a (probably incomplete) list of forms that you will be asked to complete.

The most important ones have already been mentioned.

- (1) *Registration form*. It is vital that you fill this in, since otherwise we have no official knowledge of you. Registration is by computer during the introductory Wednesday. If you do not register then, please register as soon as possible thereafter.
- (2) *Attendance lists*. After two to three lectures, when the crowds have died down, your lecturer will hand out a form asking you your name, college and e-mail. The main use of this list is to allow your lecturer to contact his or her class by e-mail. Completing this form does not commit you to attending future lectures.
- (3) *Lecture questionnaires*. Towards the end of the course you lecturers should hand out a questionnaire. Please complete it even if you feel that you have little to say, the fact that you have little to say is important in itself. The main use of this questionnaire is to allow the lecturer to reflect on how the course has gone.
- (4) *Interview questionnaires*. The main use of this questionnaire is to allow you to reflect on how things have gone so far and on how you are preparing for the future. Please fill it out before the interview. As we say elsewhere, we attach great importance to the interviews and failure to attend an interview will set alarm bells ringing.

- (5) *End of year survey.* Whether you are dissatisfied or not, we ask you to fill in the end of year survey. This contains a certain number of questions to help elicit your opinion, but you should feel free to add extra comments to anything you wish. The surveys will be read carefully by the Head of Department, the Part III Course Director in your department and by all members of the Part III Committee.
- (6) *Other surveys.* You may be asked to fill out other surveys. These surveys are generally sent out by people who believe that the collection of meaningless data will, if continued long enough produce meaning. Please heave a sigh and fill these surveys in. If you do not, a Department Representative will have to attend incredibly boring meetings about low response rates.

Disclaimer

You are encouraged to seek advice from lecturers, advisers and everybody else. However advice is simply advice. It is up to you and you alone to decide what use to make of it.

9 RESOLVING PROBLEMS

Sometimes students find that Part III does not suit them. If you find yourself in that position you should **at once**¹ consult both your Departmental Contact or the Departmental Course Director and your College Director of Studies (if he or she is not available go directly to your College Tutor). It may be possible to switch to another course, or it may be possible to find you a path through Part III, or the best solution may be for you to cut your losses and leave.

The role of the Colleges

Students from outside Cambridge tend to underestimate the interest their College takes in them and the help and advice that their College can supply. Your College is a completely independent institution. (Although your Director of Studies will probably belong to the Faculty of Mathematics, most of the Fellows at your College do not.) If you need an advocate with the University or the Faculty, your College will provide one. The Faculty sees you as a student of mathematics; your College sees you as a member of the College entitled to the best deal available.

Any decision you make with the help and advice of your College is likely to be better than one you make by yourself. However difficult your situation seems to you, it is very likely that your College can help. Colleges are used to negotiating with the University bureaucracy and with grant-giving bodies.

Examination results

Examinations are a University matter and covered by strict regulations. Whether you have a complaint or not, **you should not, under any circumstances, seek to discuss your examination result with your examiners.** The University has a standard procedure for dealing with complaints about examination results.

Any complaints or requests for reconsideration must be made in writing by your College (usually via your Senior Tutor) to the Chairman of the Examiners. You should therefore discuss the matter with your College Tutor who will advise you further. You should note that any investigation by the University will usually confine itself to seeing that the examiners acted correctly (for example that

¹ This is important. Some choices which are available in the first two or three weeks may not be possible later. In particular, University rules treat students who have completed the first 21 days of a course very differently from one who has not yet done so, and this may have important financial consequences for the students involved.

all the marks you received were entered into the mark book) and not try to second guess the examiners by re-marking your papers.

Problems with a particular course

If you have a problem with a lecture course the simplest and fastest way of dealing with it is to contact the lecturer directly. He or she will be happy to explain difficult points or recommend supplementary reading. Sometimes problems can not be resolved completely (for example if two lecture courses clash) but often a solution can be found.

If your problem cannot be resolved by contacting the lecturer, then you may wish to consult the relevant *Subject Adviser* or *Part III Course Director*, or to email the *Faculty Hotline*. (See section 8 above.)

If you are having problems mastering a course, it is very likely that other students are having similar problems. Sometimes (particularly when the lecture audience is small) students organise self-help groups to discuss the course. Graduate students who did the course in previous years can also be helpful. (There is nothing mathematicians like more than finding someone who knows even less than they do and lecturing to them.)

Medical problems and disabilities

Sometimes students with medical problems or disabilities tell nobody about them, either because they do not want special consideration or because they do not think that anything can be done. Part III is hard enough without adding extra problems and we strongly advise discussing such problems with your college. Sometimes nothing can be done but sometimes something can be done relatively easily.

Final remark

Part III is a tough course with a tough examination. Very few Part III students are not unhappy or worried from time to time. But, if you are unhappy or worried most of the time either about the whole course or about some important aspect of it, then something is definitely wrong and you must seek advice in Department or College without delay.

10 DAMTP INFORMATION

You should read the following carefully if you choose DAMTP as your Department of registration, or if you take lecture courses given by DAMTP.

DAMTP Part III Course Director:

The DAMTP Part III Course Director is Professor Malcolm Perry. Professor Perry's office is B1.26, telephone (3)37895. The Course Director may be contacted through the email: partiii-director@damtp.cam.ac.uk. In case of difficulties please email: casm@maths.cam.ac.uk

Subject Advisers

The DAMTP Subject Advisers are as follows:

Subject	Adviser	Room	Email
Astrophysics	Dr G.I. Ogilvie	F1.11	G.I.Ogilvie@damtp.cam.ac.uk

Continuum Mechanics	Prof. J.R. Lister	H1.08	J.R.Lister@damtp.cam.ac.uk
Applied and Computational Analysis	Prof. A. Iserles	F2.06	A.Iserles@damtp.cam.ac.uk
Particle Physics, Quantum Fields and Strings	Dr D Tong	B2.13	D.Tong@damtp.cam.ac.uk
Quantum Information and Quantum Foundation	Prof. R. Jozsa	F0.10	R.Jozsa@damtp.cam.ac.uk
Relativity & Gravitation	Prof. E.P.S. Shellard	B2.07	E.P.Shellard@damtp.cam.ac.uk

Subject Advisers have responsibility for co-ordinating courses in a particular subject area and for acting as a contact point expertise on that area. Students are welcome to consult subject advisers as necessary.

All members of DAMTP are based at CMS in Pavilions B, F, G, H. You should feel free to consult subject advisers, lecturers or any other members of the Department as appropriate.

Interviews

Each Part III student registered with DAMTP will be interviewed twice during the year to monitor progress. Each student will be assigned an interviewer by the Course Director. Interviewers will be pleased to offer general advice and will refer questions on to others with more detailed knowledge, where appropriate.

DAMTP Information Services

The main collection of relevant books and journals is in the Betty and Gordon Moore library (BGML) behind the Newton Institute. In addition, the University Library (UL) in West Road holds some of the Part III texts. Some of the large college libraries such as Trinity and St John's keep a reasonable number of maths and physics books and many college libraries have a selection of the most commonly used texts. Biological and geological journal titles are kept in the Central Science Library (CSL) in Bene't Street.

The DAMTP information services web page is accessible from the DAMTP home page under internal information (www.damtp.cam.ac.uk/info-office) From this there are links of interest to DAMTP, as well other sites like online databases, conference information received in the department, research councils and societies etc. etc. The majority of the databases, such as maths publications via MathSciNet and the HEP/GR preprints via the Southampton LANL link, do not require a password. An Athens username and password needed for access to the online science citation index (Web of Science) and some journals are available from the Betty and Gordon Moore Library or any of the university libraries.

Examples Classes

All DAMTP lecture courses are complemented by Examples Classes. Example sheets of problems will normally be issued well before the classes. Note that while the instructor will normally run through the problems during an examples class, he or she will not have time to go into great detail; hence you will obtain most benefit from the examples classes if you work through the problems *before*, repeat, *before* the classes. The times of the examples classes will be posted on the Part III

notice board. The lecturer should also announce the arrangements well in advance. DAMTP examples sheets will be available in the pigeonholes in the Part III room, and also on the web at www.damtp.cam.ac.uk/user/examples/indexP3.html.

Books

A collection of some of the most important books for the DAMTP Part III courses is maintained in the Part III room, shelved A-Z by first author/editor. These books are for the use of all DAMTP Part III students and must not be taken out of that room. There is also a bound set of Part III exam papers for the years 1997-2011.

11 DPMMS INFORMATION

You should read the following carefully if you choose DPMMS as your Department of registration, or if you take lecture courses given by DPMMS.

DPMMS Part III Course Director

The DPMMS Part III Course Director is Professor Imre Leader. His office is C2.02 (CMS), telephone (7)65902, email I.Leader@dpmms.cam.ac.uk.

Registration

If you register with DPMMS, then you should also indicate your major field of interest from amongst:

Algebra, Analysis, Combinatorics, Geometry and Topology, Foundations, Number Theory,
Algebraic Geometry, Probability, and Statistics.

In each field there is a Subject Adviser. You MUST register with one adviser (usually by signing the list on the door of his or her room at CMS). Your Adviser will be glad to give you any technical help or advice about courses or your future plans. You can, of course, consult any Adviser you wish and you may change Advisers at any time, provided that you inform both your old Adviser and the new one.

The DPMMS Subject Advisers are as follows:

Subject	Adviser	Room/Tel	Email
Algebra	Dr C.J.B. Brookes	C1.06/65894	c.j.b.brookes@dpmms.cam.ac.uk
Analysis	Prof B.J. Green (M) Dr M Dafermos (E,L)	E1.19/37970 E2.081/64293	b.j.green@dpmms.cam.ac.uk m.dafermos@dpmms.cam.ac.uk
Combinatorics	Prof. I. Leader	C2.02/65902	i.leader@dpmms.cam.ac.uk
Logic and Foundations	Prof. P.T. Johnstone	C1.07/37985	p.t.johnstone@dpmms.cam.ac.uk
Differential Geometry and Topology	Dr I. Smith	E2.01/64277	i.smith@dpmms.cam.ac.uk
Number Theory	Prof. A J Scholl	E1.05/65889	a.j.scholl@dpmms.cam.ac.uk

Algebraic Geometry	Prof I. Grojnowski	E1.03/37930	i.grojnowski@dpmms.cam.ac.uk
Statistics	Dr R Nickl	D1.01/65020	rnickl@statslab.cam.ac.uk
Probability	Prof G R Grimmett	D1.02/37957	g.r.grimmett@statslab.cam.ac.uk

All members of DPMMS are at the CMS in Pavilions C, D and E. You should feel free to consult Advisers, Lecturers and any other members of the department.

Statistical Laboratory

Those students who are taking courses in Statistics, or Probability may need access to specialised computing facilities for their courses. Your Adviser will give you instructions about this and you may also contact the Enquiry Office in the Statistical Laboratory (Pavilion D).

12 BOOKS AND LIBRARY INFORMATION

The main mathematical and physical sciences library of the University is the Betty and Gordon Moore Library (Moore) at CMS. (There are no separate Departmental Libraries for the Mathematics Departments.) Detailed information on the Moore is provided on their website <http://www.lib.cam.ac.uk/BGML/>, with the maths information resource guide at <http://www.lib.cam.ac.uk/BGML/mooremathsguide.html> perhaps especially relevant. Please note that you must register when you first use the Moore and that, having done so, Part III students are entitled to full borrowing rights and may apply for 24-hour reference access.

The University Library (UL) in West Road holds some of the texts recommended for Part III. Some of the larger College libraries such as Trinity and St John's keep a substantial number of mathematics and physics books and many other College libraries have a selection of the texts that are used most commonly in Part III. Your College library may purchase Part III texts that it does not hold – you will need to make a case to your College Director of Studies (see section 8).

Other libraries in Cambridge may be relevant to Part III students (e.g. when preparing the Part III Essay). For example, the Central Science Library (CSL) in Bene't Street holds biological and geological books and journals. The Isaac Newton Institute for Mathematical Sciences maintains its own library. Reference access to this library for non-Institute personnel may be granted at the discretion of the Institute Librarian. A complete listing of Cambridge libraries may be found at http://www.lib.cam.ac.uk/libraries_directory/libraries_directory.cgi.

The Cambridge online library catalogue, Newton, is accessible from any networked computer. The catalogue at <http://ul-newton.lib.cam.ac.uk/> allows you to search for Moore Library books, and a list of all the Newton databases is given at <http://www.lib.cam.ac.uk/newton/>.

LibrarySearch (<http://search.lib.cam.ac.uk/>) enables the cross-searching of records for printed books, journals, and electronic material held in all the libraries in the University of Cambridge. Records

from the Newton library catalogues and the DSpace@cambridge repository are included, and searches can be expanded to include article databases such as JSTOR.

A collection of some of the most important books for the DAMTP Part III courses is maintained in the Part III Room by the DAMTP Part III Course Director. These books must not be taken out of the Part III Room.

A collection of Statistics books is available for reference in the MPhil Common Room in Pavilion D.

The photocopier in the Part III Room may be useful for copying books or journals borrowed from the Moore (or elsewhere). Note that photocopying regulations allow the photocopying of one chapter or 5% of a book (whichever is the larger) or, for journals, one article from each issue (not volume) of the journal.

13 Part III COMPUTING FACILITIES

Laptops/Wifi Devices

You can connect to the Internet using wireless in the Central Core and in the Part III room, or using a wired connection by plugging in to data-ports in the Part III Room which are connected to the **CMS laptop network**. These are clearly labelled and normally provided with an orange patch cable. Please do **not** connect your laptop to a data-port which is being used by a PWF computer or any other unlabelled port.

<http://www.maths.cam.ac.uk/lapnet/>

To use the CMS laptop network you will need to provide your Raven password.

How to get a Raven password: <http://www.cam.ac.uk/cs/docs/faq/n5.html>

Resetting your Raven password: <http://www.cam.ac.uk/cs/docs/faq/n6.html>

PWF Windows/Linux PCs available for Part III students at the CMS

PCs connected to the University Personal Workstation Facility (PWF) are available for use by Part III students in the Graduate Studies Centre in CMS Pavilion B basement (the Part III room).

<http://www.damtp.cam.ac.uk/internal/computing/pwf/>

<http://www.cam.ac.uk/cs/pwf/>

The computers are "dual-boot" - this means they can be started up to run either Microsoft Windows or Linux. You may use whichever operating system you prefer, but students who intend to stay on to do research may wish to learn Linux as most of the computers in DAMTP/DPMMS run Linux.

PWF computer accounts and passwords are administered by the Computing Service. Students who are new to Cambridge should receive details of their account from the Computing Service. Students who did the Cambridge Tripos course should ask Computing Service Reception to re-activate their account if it was closed down during the summer vacation.

<http://www.cam.ac.uk/cs/pwf/gettingstarted/>

Many software applications are available on both Linux and Windows computers:

<http://www.cam.ac.uk/cs/pwf/software/>

The Moore Library, many colleges and Departments have similar PWF facilities. PWF rooms (including locations) are listed at:

<http://www.cam.ac.uk/localuseronly/cs/pwf/facilities/manclus.html>

<http://www.cam.ac.uk/localuseronly/cs/pwf/facilities/csrooms.html>

Printing:

Maths Part III students are given some print credit at the start of each academic year that can ONLY be used to print to the two printers in GL.04 and to the two printers in the Part III room in the basement of Pav B. The amount given is calculated each year using logs from the previous year as well as the expected printout requirements for each course. The amount given is set at a *generous* level and should not require topping up during the year. If for any reason you run out of credit you can apply in writing for additional credit:

<http://www.damtp.cam.ac.uk/internal/computing/pwf/PWF-print.html>

Personal web pages:

<http://www.cam.ac.uk/cs/pwf/web/>

Computing Help

Please email requests for assistance and any other comments to the Faculty Computer Officers at:

help@maths.cam.ac.uk

Other Contacts

The following email addresses may be of use:

Part III Secretary	casm@maths.cam.ac.uk	General enquiries
Faculty Office	faculty@maths.cam.ac.uk	Essay & examination enquiries
All Part III Students	partiii-students@maths.cam.ac.uk	

You may only use the partiii-students@ address for sending information that is of genuine *academic interest to all* students. Most of you will have *no* need to use them. If you do you might like to remember that the Course Directors are on these lists as well, and they do not like junk email!

Rules

Users of the Part III computing facilities are subject to some rules:

<http://www.cam.ac.uk/cs/rules/>

If you need help with interpreting the rules, please ask the Computer Officers by sending email to **help@maths.cam.ac.uk**

Note in particular that

PWF accounts are issued for use by a single individual. You must not log in using another person's login name, or allow any other person to access facilities using your login name. You should not leave yourself logged on to any PWF computer when you leave the room, always log off first. Failing to do so not only breaks University Computing Server (JANET) rules but it also means other people can edit, delete or copy your work for their benefit.

- Computer hardware should be used carefully and left in a condition fit for others to use. **Do not ever switch computers off.** Please report all faults immediately to *help@maths*.
 - Equipment should not be moved or connected to the network without prior authorisation.
- 17 Information belonging to other users is confidential. You must not read, access or modify any file not owned by you without the explicit permission of the owner. When a file is not protected (i.e. read or write access by others is allowed), it should not be assumed that permission to copy or modify the file is granted.
- Proprietary software must be used correctly in accordance with licensing conditions and must not be copied or modified. If you install any proprietary software, including shareware, on Part III computers, you must hold a valid licence. The University or responsible members of staff may be liable to prosecution if unlicensed software is found on any computer. The Computer Officers will delete without warning any illegally-held software discovered on Part III computers.
 - Users must always abide by any legislation that applies to the use of computer systems, e.g. Computer Misuse Act 1990, and laws relating to copyright and criminal damage. Storage and use of personal data on computer systems is regulated by the Data Protection Act 1998.

- Games playing is offensive and distracting to others working nearby and is not allowed.
- Users must **not access** any material on the World Wide Web, Internet News, or other facility which:
 - (a) is libellous, racist, obscene or indecent,
 - (b) is likely or designed to cause offence, inconvenience or anxiety to others.
 - (c) infringes copyright law or any other law (images and sound particularly),
 - (d) is of a character likely to bring the University or Faculty of Mathematics into disrepute.

If you encounter such material by accident you are advised to stop viewing immediately and avoid accessing the site or newsgroup again.

14 RESEARCH AND CAREERS

Many of you will be hoping to pursue a career in mathematical research.

For more information about general issues attend the talk '*PhD Applications*' 1615 Wednesday 12 October CMS MR2.

Subject advisers and lecturers can advise you on the opportunities for research both within Cambridge, elsewhere in the UK, and abroad. In many cases you need to apply early. Many foreign universities and grant-making bodies have deadlines well before the New Year. Universities in U.K. are increasingly making offers early in the Lent term. Of course, Cambridge is anxious to attract the most able students to continue their studies here. You will be asked in the later part of the first term whether you wish to apply for a research position at Cambridge. If you do, you are strongly encouraged to speak to potential supervisors as soon as possible. The availability of Research Council grants varies from one subject area to another, so you need to seek individual advice. Many, but not all, awards for research at Cambridge are dependent on your performance in the examination at the end of the year. Both Departments will consider making firm offers in the New Year and DAMTP, in particular, expects to be able to make several such offers. Further details about this will be available at the talk '*Research Opportunities in Cambridge*' given at 1615 on Wednesday 26 October in CMS MR2.

For those who need more general careers advice, the University Careers Service is situated in Stuart House, 6 Mill Lane. The service has extensive information about fields of work, individual employers, and current vacancies. There are also 11 careers advisers available to those who wish to book individual discussions.

15 GENERAL INTEREST LECTURES AND COURSES

You are welcome at any lecture course or seminar organised by the departments. Indeed you are welcome at most lectures and seminars organised throughout the University.

The *Lecture List* edition of the *Cambridge University Reporter* lists all the lectures in the University. Notices announcing seminars in DAMTP, DPMMS and other select departments will be placed on the notice boards in the Part III room, and in central boards at CMS.

The Faculty of Mathematics and the Isaac Newton Institute for Mathematical Sciences (on Clarkson Road) run together a very good series of general mathematical seminars on Mondays at 1700. See <http://www.newton.cam.ac.uk/instsem.html> for details.

The Computing Service offers a range of training courses covering access to the Internet, World Wide Web, electronic mail (e-mail) and use of the PWFs, word processors, spreadsheets, databases and statistical packaging. See <http://www.cam.ac.uk/CS/Courses/> for details.

16 TALKS AND ADVICE

Help is available. During the first four weeks of Michaelmas term, three afternoons each week, PhD students run the Part III cafe, providing free tea, coffee, biscuits, quick assistance with lectures, and informal advice about the course and life in Cambridge generally. Part III students will also be encouraged to form study groups to review materials in lectures. There will be a meeting on the first Friday in term to explain how these work. There are talks most Wednesday afternoons, offering advice on matters including applications for PhD places and writing a Part III essay.

Thursday 10th November PhD students from other universities in the UK will be available to talk about research in their institutions (“Research groups in UK afternoon”). Individual research groups within CMS will hold events giving Part III students the chance to talk to PhD students within the group. The calendar of these events will be available on the Graduate Mathematics Society website. <http://www.srcf.ucam.org/cugms/>

There will also be opportunities for Part III students to give informal seminars (Part III Seminar Series) to their peers and interested PhD students at the end of Michaelmas and Lent terms. You are encouraged to take advantage of these opportunities.

APPENDIX I: Part III Calendar 2011-2012

OCTOBER 2011		
Tuesday	Oct 04	Michaelmas Full Term begins.
Wednesday	Oct 05	Introductory meeting, 0930 at CMS in MR2.
Thursday	Oct 06	Group Photograph and Welcome Drinks Party 1630 at CMS. Michaelmas Term lectures begin.
Friday	Oct 07	Study group meeting. 1600 at CMS in MR9.
Wednesday	Oct 12	Talk: <i>PhD applications</i> , 1615 at CMS in MR2.
Wednesday	Oct 19	Talk: <i>Exams and lectures</i> , 1615 at CMS in MR2.
Wednesday	Oct 26	List of examination courses announced in <i>Reporter</i> .
Wednesday	Oct 26	Talk: <i>Research Opportunities in Cambridge</i> , 1615 at CMS in MR2.
NOVEMBER		
Wednesday	Nov 02	Talk: <i>How to Prepare a Talk</i> , 1615 at CMS in MR2.
Wednesday	Nov 09	Deadline for Faculty members to request additional examination papers.
Thursday	Nov 03	Graduate Studies Elsewhere Open Afternoon.
Wednesday	Nov 16	Talk: <i>How to write a Part III essay, (1) How to read a paper</i> , 1615 at CMS in MR2.
Monday	Nov 21	Essay descriptions available to candidates via the web pages.
Wednesday	Nov 30	Part III seminars, afternoon.
Wednesday	Nov 30	Last day of Michaelmas term lectures.
DECEMBER		
Thursday	Dec 01	Part III seminars, all day.
Friday	Dec 02	Part III seminars, all day. End of Seminar Series Party.
Friday	Dec 02	Michaelmas Full Term ends. Final list of examinable courses announced in <i>Reporter</i> before this date. Some Examples Classes and Supervisions run into the following week. The Christmas vacation should be used to review lecture material from the Michaelmas term. Some students begin work on their essay.
JANUARY 2012		
Tuesday	Jan 17	Lent Full Term begins.
Thursday	Jan 19	Lent term lectures begin.
Wednesday	Jan 25	Study group sign-up. Tea 1615.

FEBRUARY		
Wednesday	Feb 01	Deadline for candidates to request additional essay titles.
Wednesday	Feb 15	Talk: <i>How to write a Part III essay, (2) From outline to essay</i> , 1615 at CMS in MR2.
Thursday	Feb 23	List of additional essay titles available to candidates via the web pages.
MARCH		
Wednesday	Mar 07	Talk: <i>revision strategies</i> , 1615 at CMS in MR2.
Wednesday	Mar 14	Last day of Lent term lectures.
Wednesday	Mar 14	Part III seminars, afternoon.
Thursday	Mar 15	Part III seminars, all day.
Friday	Mar 16	Part III seminars, all day. End of Seminar Series Party.
Friday	Mar 16	Lent Full Term ends. BUT Some Examples Classes and Supervisions run into the week following the end of term. Many students complete their essays during the Easter vacation. Taking time to review Lent term courses and begin examination preparation is also advisable.
APRIL		
Tuesday	April 24	Easter Full Term begins. Candidates receive examination entry forms to indicate choice of examination papers and essay.
Thursday	April 26	Easter term lectures begin.
MAY		
Friday	May 04	Deadline for return of forms giving choice of examination papers and essay. Deadline for submission of essays.
Wednesday	May 23	Easter term lectures end.
Thursday	May 31	Part III examinations begin.
JUNE		
Tuesday	June 12	Part III examinations end.
Friday	June 15	Full Term ends.
Wednesday	June 20	It is expected that your exam results will be available to you (and on one else) via CamSIS at 1600.
Thursday	June 21	Examination results announced at Senate House, 0900.
Friday	June 22	PARTY

APPENDIX II: Faculty Board Advice to Examiners

Aims and Objectives of Part III of the Mathematical Tripos

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.

Examinations

Courses of 24 hours duration count as 3 units and are examined by 3 hour papers. Courses of 16 hours duration count as 2 units and are examined by 2 hour papers. Students may write one essay which counts as 3 units. Students may take up to 19 units for examination.

Each paper is set and marked by an assessor. They award marks out of a maximum of 100 and in addition assign a 'quality mark'. This will usually be a straight reflection of the numerical mark in accordance with the table below:

92-100	$\alpha+$
81-91	α
70-80	$\alpha-$
59-69	$\beta+$
48-58	β
37-47	$\beta-$
26-36	$\gamma+$
15-25	γ
1-14	$\gamma-$

However, if the assessor feels that the quality of a candidate's work is not properly represented by the numerical mark, then the quality mark will reflect this. When there is a substantial discrepancy between the numerical and quality mark this must be explained in a note to examiners.

In addition assessors may make comments about the nature of the performance of individual candidates and about the overall difficulty of the paper.

The Faculty's Certificate given to each successful candidate includes the numerical mark and quality mark for each paper.

Classification

As a result of the examination, each candidate is placed in one of the following categories: Distinction, Merit, Pass, Fail or 'Other'. 'Other' may include, for example, candidates who were ill for part of the examination.

The Faculty Board has laid down the following criteria for deciding the different classes.

Distinction. Candidates will have demonstrated mastery over a considerable range of material. Their performance will have been such as would be expected of someone starting PhD research at a leading mathematics department.

Merit. Candidates will have performed at first class level. In the words of the criteria used for a first class in our undergraduate examinations they 'will have demonstrated a good command and secure understanding of examinable material. They will have presented standard arguments accurately and showed skill in applying their knowledge.'

Pass. Candidates will have performed at upper second class level. They will have demonstrated the ability to absorb and understand difficult material but there may remain gaps in their understanding and they may not always be able to apply their knowledge successfully.

The examiners are responsible for assigning a class to the candidates but are not expected to rank candidates within classes. The chairman of examiners should discuss with the external examiners which candidates are likely to lie on borderlines so that the external examiners may pay particular attention to the scripts of those candidates.

The examiners are asked to classify students according to the descriptions above taking account of the following guidance issued by the Faculty Board. If the examiners have difficulty in applying any of the Faculty Board recommendations, then they are asked to draw attention to the specific problem in the examination report.

It is expected that examiners will consider that quality marks are at least as important as numerical marks. The Faculty Board recommends that examiners classify candidates on their best rather than their worst papers. It expects that, in practice, this will mean that the award of distinctions will depend mainly on consideration of α grade papers and merits on consideration of both α and β papers. The treatment of candidates on the pass/fail border line must always depend on individual considerations.

The Faculty Board expects that the examiners will award about 35%-40% Distinctions and about 20%-25% Merits. Based on past experience the Faculty Board expects the number of Fails to be small but to fluctuate substantially from year to year.

In addition the Faculty Board has issued the following advice to examiners.

- In classing students the examiners will not consider whether they have chosen to be examined on 17, 18 or 19 units. Since judgements are made on the best papers the choice of 17, 18 or 19 units will not affect their chances of obtaining a distinction or a merit. Although it is possible to get a distinction or a merit with fewer units, the examiners may take into account the fact that students taking fewer than 17 units have covered a smaller range of courses.
- In deciding whether to pass students the examiners will not consider the number of units the students have chosen to be examined on provided the number is greater than or equal to 12. Although it is possible to pass with fewer units, the examiners may take into account the fact that students taking fewer than 12 units have covered a smaller range of courses.
- Students should not be penalised for the act of sitting a paper.
- The Faculty Board does not necessarily expect the mark distribution for essays to be the same as that for written examination. Many students produce excellent essays and the Faculty Board wishes the hard work and talent thus exhibited should be properly rewarded.
- The Faculty Board recognises that the length of an essay is only a weak reflection of the quantity of work involved and bears no relation to the quality of the work done. However, it is anxious to prevent the essay absorbing too much of the candidate's time. It is therefore perfectly content if a topic is set for which an excellent essay requires about 5000 words and would be unhappy if a topic were set for which an excellent essay required more than 8000 words. The Faculty Board does not wish candidates to worry about word count but would like essay setters who discover that their essays regularly elicit more than 8000 words to consider whether their topics are too demanding.