

# Mathematical Institute and Department of Physics Examination Conventions 2024-2025

Master's in Mathematical and Theoretical Physics (MMathPhys)  
MSc in Mathematical and Theoretical Physics (MScMTP)

## 1 Introduction

This document sets out the examination conventions for the **Master's in Mathematical and Theoretical Physics (MMathPhys)** and the **M.Sc. in Mathematical and Theoretical Physics (MScMTP)** for the academic year 2024-2025. Examination conventions are the formal record of the specific assessment standards for the course or courses to which they apply.

This document explains how work will be marked and how a final result and degree classification will be derived from these marks. These examination conventions are approved annually by the Joint Supervisory Committee for the MSc in Mathematical and Theoretical Physics and Master of Mathematics and Physics. The Board of Examiners may only make minor deviations from these conventions in exceptional circumstances and only after the consent of the Proctors. This document is in all ways subsidiary to the current:

- *Examination Regulations,*
- *Policy and Guidance for Examiners and others involved in University Examinations.*

## 2 General Structure of the Examination

All courses in this programme have either a component of formal assessment—written invigilated exam, take-home exam, or mini-project—or a homework completion requirement. Some courses may be taken *either* as a homework completion course or a formally assessed course. One course (Groups and Representations) requires both a formal assessment *and* homework completion. Any course taken with a component of formal assessment will be referred to as a “formally assessed course”.

Students are required to undertake at least ten units within the programme, where one unit normally corresponds to a 16-hour lecture course. This means that a 16-hour lecture course counts as one unit, while, for example, a 24-hour lecture course counts as 1.5 units. More specifically, students are required to offer:

- at least four units that are assessed by written invigilated examination;
- at least three further units from formally assessed courses;
- at least three other units, which may be from formally assessed courses or from courses with homework completion requirement only.

A dissertation contributes one—in the case of an extended dissertation, two—units in (b) and/or (c). There are no other formal constraints on course choices and students are otherwise free to design their own pathways within the course offering.

**It is the student's responsibility to ensure that she/he fulfils these requirements for the overall number of units and the number of formally assessed units offered and completed.**

## 2.1 Approved Courses

Candidates may, with specific permission of the Course Director, substitute up to a maximum of three units with appropriate courses of study from outside the published list. These will normally be from the Departments of Mathematics, Physics, or Computer Science. The Course Director will indicate at the point of approval the number of units for which a given approved course will count.

Where an approved course is taken, examination for the course is the responsibility of the Examination Board responsible for the setting of the paper (*e.g.*, the Part C Mathematics, Physics, or Computer Science Examiners), and follows the rules set out in the examination conventions for the course offering the assessment. Exceptionally, Part B courses may be allowed as approved courses, but in these cases an extra component of work may be required to bring them up to an appropriate level.

## 3 Assessment Types

Formally assessed units will be assessed by one or more of the following means:

- invigilated written examinations;
- take-home examinations;
- mini-projects;
- a dissertation.

The modes of assessment for all courses being offered in 2024-2025 are detailed in Appendix A.

Certain lecture courses offered within the MMathPhys/MScMTP are Part C Mathematics courses offered within the MMath and MSc in Mathematical Sciences programmes. The examinations for these courses are the responsibility of the Part C Mathematics/OMMS Examiners and follow the rules set out in the corresponding examination conventions.

### 3.1 Invigilated Written Examinations

The duration of written examinations will normally be 1.75 or 2 hours for a 16-hour lecture course and 3 hours for a 24-hour or 28-hour lecture course. Candidates will typically be asked to answer two (three) questions for 16-hour (24/28-hour) lecture courses, each worth 25 marks. Expected dates or date ranges for each exam and the structure of the paper can be found in Appendix A.

Written examinations will be marked by a single assessor according to pre-agreed model solutions and marking schemes. The examination scripts will then be checked by an independent checker to ensure that all work has been marked, and that the marks have been correctly totalled and recorded.

The use of handheld pocket calculators is generally not permitted but certain kinds may be permitted for some papers. Specifications of which types of calculator are permitted for any such exceptional papers will be announced by the Examiners in the term preceding the examination.

### 3.2 Take-Home Examinations

Courses may be assessed by take-home exams.<sup>1</sup> These are written examinations which students are expected to complete at home over a period of several days. Students are allowed to use books, but must not discuss the exam with anybody else. Take-home exams will normally be marked by a single assessor, according to pre-agreed model solutions and marking schemes. The examination scripts are then checked by an independent checker to ensure that all work has been marked, and that the marks have been correctly totalled and recorded.

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<sup>1</sup>In 2024-2025, only one course (Collisionless Plasma Physics) will be assessed by take-home exam.

### 3.3 Mini-Projects

Mini-projects are normally set by the course lecturer. Mini-projects set for courses in HT will be released to candidates at the end of that term (often Friday of week 8), and the submission deadline will be several weeks later (often at the end of week 11 of that same term). Mini-projects set for courses in TT will be released to candidates on the Monday of week 6 of term, and the submission deadline will be noon on the Monday of week 9 of term.

For Advanced Philosophy of Physics, the mini-project will comprise two essays of at most 5,000 words each. A list of approved essay topics will be released on or before Friday of week 4 of Hilary Term. Students may apply for approval for their own topics following the procedure specified in the Examination Regulations for the Honour School of Physics and Philosophy. Any such application must be received no later than Friday of week 6 of Hilary Term. Essays must be submitted by noon on Friday of week 4 of Trinity Term. The regulations for preparation and submission of the essays are otherwise identical to those governing essays for other Philosophy subjects in Part C, as specified in the Special Regulations for Philosophy in all Honour Schools involving Philosophy.

Mini-projects will be double-blind marked, normally by the course lecturer and one other assessor. The marks of the two assessors will be reconciled following the standard procedure detailed in Appendix B. Qualitative descriptors for levels of performance characterised by ranges of USMs are given below in Appendix D.1. The exception to this is that mini-projects which have pre-agreed model solutions and marking schemes will be marked by a single assessor. Such mini-projects will then be checked by an independent checker to ensure that all work has been marked, and that the marks have been correctly totalled and recorded.

### 3.4 Homework Completion

Some courses require that homework is completed to a certain standard in order to complete the course. There are three types of such courses:

- courses with formal assessment (an invigilated written examination, a take-home examination, or a mini-project) **and** a homework component that needs to be completed (only Groups and Representations in 2024-2025),
- courses with formal assessment (an invigilated written examination, a take-home examination, or a mini-project) **or** a homework component that needs to be completed, and
- courses without formal assessment (mostly certain advanced courses taught in HT and TT) but with a requirement for homework completion.

Note that courses from Part C of the MMath program do not have homework completion requirements. The tables in Appendix A indicate the assessment method for every course and whether or not the course has a homework completion requirement.

The homework for all courses with a homework requirement will be assigned by the lecturer of the course. Each homework submission will be marked by a teaching assistant (TA) based on solutions provided by the lecturer. Some of the courses will be accompanied by classes led by tutors in order to discuss the homework assignments. The homework problems will be marked using a letter system A/B/C for problems solved or attempted competently (A for excellent, B good, C fair), and F for those problems which are not handed in or, if attempted, show insufficient understanding of the concepts taught in the lectures. The TA will record the mark of each problem and return the marked scripts as promptly as possible.

The homework requirement for a course will have been completed if 50% of each problem sheet assigned has a mark A/B/C. Otherwise the homework requirement will normally be judged to have not been completed. The Examiners will make the final determination as to whether or not each student has completed the homework requirement for any given unit.

#### 3.4.1 Late homework submission

Each homework will have a submission deadline after which submissions will not be accepted. Where a homework cannot be submitted on time due to acute illness or other urgent cause, students should submit a request for an

extension or excusal for that homework. Where the extended deadline requested falls before the class at which the work will be discussed, the request will be considered by the lecturer of the course; where the extended deadline would fall after the class, or where an excusal is requested, the request will be considered by the Chair of Examiners.

Details on the procedure to follow to request an extension or excusal can be found in the Course Handbook.

### 3.5 Dissertations

Dissertations will normally be marked by the dissertation supervisor and blind-marked by one other assessor with relevant expertise. The marks of the two assessors will be reconciled following the procedure detailed in Appendix B. Qualitative descriptors for levels of performance characterised by ranges of USMs are given below in Appendix D.2.

A standard dissertation counts for one unit. Subject to permission from the Joint Supervisor Committee, candidates can opt for an extended dissertation with a wider scope which will count for two units.

The assessors of a dissertation that, in their view, shows particular originality and/or insight may recommend to the Examiners that the dissertation be given a commendation.

The submission deadline for dissertations is noon on Monday of week 6 of Trinity Term.

### 3.6 Penalties for Non-attendance

Rules governing non-attendance at examinations and any consequent penalties are set out in full in the Examination Regulations (Regulations for the Conduct of University Examinations, Part 14). If a student will be prevented by illness or other urgent cause from attending one of their examinations they should contact their college office as soon as possible.

Any case of non-attendance at an examination involving illness or other medical condition will require written medical evidence and will usually be referred by the college to the Proctors. If the Proctors do not believe there are satisfactory reasons for non-attendance, or an application to the Proctors has not been submitted, a candidate will be awarded a mark of zero for that examination.

**For Part C students (MMathPhys students), failure to submit a required element of assessment or to attend a required examination without an accepted reason will result in failure of the entirety of Part C (MMathPhys). For MSc students, failure to submit a required element of assessment or to attend a required examination without an accepted reason will result in the failure of that assessment item.**

For the purposes of applying these regulations, an element of assessment will be considered as required if its omission would lead to a failure to offer a sufficient set of units to satisfy the overall requirements of the course.

### 3.7 Penalties for Late Submission or Non-Submission

Rules governing late submission and any consequent penalties are set out in full in the *Late submission of a thesis or other written exercise* and *Consequences of non-appearance or non-submission* subsections of the Regulations for the Conduct of University Examinations section of the Examination Regulations 2024/2025.

Candidates prevented by illness or other urgent causes from submitting a dissertation, a take-home exam, or a mini-project on time should ask their college to submit an application for an extension to the Proctors on their behalf. If the Proctors grant permission to submit work late under clause 1 of paragraph 14.6 (Examination Regulations), no penalty will be applied.

Work submitted late without prior permission may still be accepted for assessment under paragraph 14.7 (Examination Regulations), but the Examiners may apply a penalty of a reduction in the mark for the work (see the table below). Candidates are advised to inform their college office or their college's Tutor for Graduates of any mitigating circumstances as soon as possible so that the college can make an application to the Proctors if appropriate.

The penalty will be a percentage reduction of the maximum total mark available for the work so, for example, in the case of a 10% penalty, 10 University standardised Marks (USMs) would be deducted. The final mark awarded after

Table 1: Late Submission Tariff for Dissertations, Mini-Projects, and Take-Home Exams

Lateness	Penalty, % point reduction
Up to 4 hours	1 %
4–24 hours	10%
24–48 hours	20%
48–72 hours	30%
72 hours – 14 days	35%
More than 14 days late	Fail

application of the penalty cannot be below 0. Penalties will only be applied after the work has been marked and the Exam Board has checked whether there are any valid reasons for late submission.

## 4 Poor Academic Practice and Plagiarism

Candidates are reminded of the importance of avoiding any suspicion of plagiarism, please see <http://www.ox.ac.uk/students/academic/guidance/skills/plagiarism> for further guidance.

The Examination Board shall deal wholly with cases of poor academic practice in submitted work and take-home examinations where the amount of material under review is small and does not exceed 10% of the whole. Assessors will mark work on its academic merit with the Board being responsible for deducting marks for derivative or poor referencing. Depending on the extent of poor academic practice, the board may deduct between 1% and 10% of the marks available for cases of poor referencing where material is widely available factual information or a technical description that could not be paraphrased easily; where passage(s) draw on a variety of sources, either verbatim or derivative, in patchwork fashion (and examiners consider that this represents poor academic practice rather than an attempt to deceive); where some attempt has been made to provide references, however incomplete (*e.g.*, footnotes but no quotation marks); or where passage(s) are ‘grey literature’, *i.e.*, a web source with no clear owner.

Where the consequence of the marks deduction would result in failure of the assessment and of the programme, the case will be referred to the Proctors. If a student has previously had marks deducted for poor academic practice or has been referred to the Proctors for suspected plagiarism, the case will be referred to the Proctors. More serious cases of poor academic practice than described above will also be referred to the Proctors.

## 5 Analysis of Marks

The Examiners will assign USMs for each unit of assessment undertaken by a student and may rescale the raw marks in order to arrive at the USM reported to students. When considering whether to scale the raw marks for a particular unit, the Examiners will take into consideration:

- the relative difficulty of the unit compared to the other units in the programme;
- the report submitted by the assessor who set and marked the unit.

The board of Examiners will use their academic judgement to ensure that appropriate USMs are awarded and may use further statistics to check that the marks assigned fairly reflect the candidates’ performances. It is expected that scaling will be achieved by a piecewise linear mapping of the percentage class boundaries onto the USM scheme.

## 6 MMathPhys/MScMTP Degree Classification Conventions

Outcomes for all formally assessed courses will be published as USMs. Qualitative descriptors for levels of performance characterised by ranges of USMs are given below in Appendix D.3.

A formally assessed course is considered completed if the USM of the course is  $\geq 50\%$  and if any homework requirement has been completed. A course with no formal assessment is considered completed if the homework requirement has been completed.

The overall  $\overline{USM}$  is calculated as described in Appendix C. The overall MMathPhys/MScMTP degree classification is as follows:

- A *Distinction* will be awarded if all of the following conditions are satisfied.
  - i) The candidate offers at least 10 units. These must contain at least 7 formally assessed units of which at least 4 units have a written invigilated exam.
  - ii) At least 10 units have been completed. In exceptional circumstances, the examiners may relax this requirement.
  - iii)  $\overline{USM} \geq 70$ .
- A *Merit* will be awarded if all of the following conditions are satisfied.
  - i) The candidate offers at least 10 units. These must contain at least 7 formally assessed units of which at least 4 units have a written invigilated exam.
  - ii) At least 9 units have been completed. In exceptional circumstances, the examiners may relax this requirement.
  - iii)  $\overline{USM} \geq 65$ .
  - iv) The candidate does not qualify for a distinction.
- A *Pass* will be awarded if all of the following conditions are satisfied.
  - i) The candidate offers at least 10 units. These must contain at least 7 formally assessed units of which at least 4 units have a written invigilated exam.
  - ii) At least 8 units have been completed. In exceptional circumstances, the examiners may relax this requirement.
  - iii)  $\overline{USM} \geq 50$ .
  - iv) The candidate does not qualify for a merit or distinction.
- A candidate not meeting any of the above will be deemed to have *Failed*.

The Examiners will use their academic judgement to ensure a fair outcome for all candidates, and to produce a consistent ranked list of candidates according to the classification scheme above.

**Master of Mathematical and Theoretical Physics:** A student on the Master's in Mathematical and Theoretical Physics course who satisfies the Examiners may supplicate for the degree of Master of Mathematical and Theoretical Physics with the above associated classification; additionally their transcript will show the classification for Parts A and B as previously assigned by the Part B Examiners in the subject in which he or she sat those parts.

**MSc in Mathematical and Theoretical Physics:** A student on the MSc in Mathematical and Theoretical Physics course who satisfies the Examiners may supplicate for the degree of MSc in Mathematical and Theoretical Physics with the above associated classification.

### 6.1 Resits

A candidate who fails to satisfy the Examiners may retake the examination on at most one subsequent occasion. This resit attempt shall normally be taken at the next opportunity, but may be deferred once, *i.e.*, it must be taken at

one of the next two opportunities. In such a case the Examiners will specify at the time of failure which components of the examination may or must be retaken, and the student will not be eligible for a merit or distinction on the whole course. Where a course is no longer being offered in the year of the resit, the Examiners will be responsible for arranging provisions. No piece of written work shall be submitted for examination on more than one occasion. No student who has satisfied the Examiners in the examination may enter again for the same examination. For more information, please see Part 14 of the Examination Regulations.

An MMathPhys candidate who resits a unit for which a technical fail mark was originally awarded (a unit for which no work was submitted or a written examination was missed) will have that paper assessed on its merits.

An MSc candidate who resits a unit for which a technical fail mark was originally awarded (a unit for which no work was submitted or a written examination was missed) will have the mark for that unit capped at 50.

## 7 Consideration of Mitigating Circumstances

Candidates who would like the Examiners to be aware of any factors that may have affected their performance before or during an examination are advised to discuss their circumstances with their college and consult the Examination Regulations (Part 13). Candidates should complete the form entitled *mitigating circumstances notices to examiners* and send this to their college with appropriate supporting material. The candidate's college will submit the application for forwarding to the relevant Chair of Examiners.

The board of Examiners will consider mitigating circumstances notices according to the following procedure:

- (a) A subset of the board will meet to discuss the individual applications and band the seriousness of each application on a scale of 1-3 with 1 indicating minor impact, 2 indicating moderate impact, and 3 indicating very serious impact. The Panel will evaluate, on the basis of the information provided to it, the relevance of the circumstances to examinations and assessment, and the strength of the evidence provided in support. Examiners will also note whether all or a subset of papers were affected, being aware that it is possible for circumstances to have different levels of impact on different papers.
- (b) The banding information will be used at the final board of Examiners meeting to adjudicate on the merits of candidates.
- (c) A brief, formal record will be kept confirming (i) the fact that information about special circumstances has been considered by the Examiners, (ii) how that information has been considered, and (iii) the outcome of the consideration.

Further information on how to make an application for consideration of mitigating circumstances in an examination is available at <http://www.ox.ac.uk/students/academic/exams/guidance>.

## 8 Examiners for 2024-2025

The internal Examiners are:  
Prof Christopher Beem (Chair)  
Prof John Magorrian  
Prof Mark Mezei  
Prof Steve Simon.

The external Examiners are:  
Prof Steven Tobias, Professor of Applied Mathematics, University of Leeds;  
Prof Toby Wiseman, Professor of Theoretical Physics, Imperial College London.

**Candidates should not, under any circumstances, seek to make contact with individual internal or external examiners for matters related to the conduct of the examination.** Any communication must be

via the Senior Tutor of the respective candidate's college, the Director of Studies, or the Course Administrator, who will contact the Proctors if appropriate. The Proctors in turn communicate with the Chair of Examiners.



# Appendices

## A Assessment Methods by Course 2024–25

### Michaelmas Term

Unit	Assessment Method	Assessment Instruction	Assessment Date	Submission Deadline	Homework Requirement	Units
Advanced Philosophy of Physics	mini-project <b>or</b> homework completion	N/A	titles released Friday wk 4 HT	12:00 Friday week 4 TT	yes for unassessed option only	1.5
Algebraic Geometry	1.75h inv. exam	best 2 questions count	week 6–8 TT	N/A	no	1
Algebraic Topology	1.75h inv. exam	best 2 questions count	week 6–8 TT	N/A	no	1
Anyons and Topological Quantum Field Theory	2h inv. exam <b>or</b> homework completion	answer 2 of 2 questions	week 0 HT	N/A	yes for unassessed option only	1
Differentiable Manifolds	1.75h inv. exam	best 2 questions count	week 6–8 TT	N/A	no	1
Field Theories and Collective Phenomena in Condensed Matter	3h inv. exam	answer 3 of 3 questions	week 6–8 TT	N/A	no	1.5
General Relativity I	1.75h inv. exam	best 2 questions count	week 6–8 TT	N/A	no	1
Groups and Representations	3h inv. exam <b>and</b> homework completion	answer 3 of 4 questions	week 0 HT	N/A	yes	1.5
Kinetic Theory	3h inv. exam <b>or</b> homework completion	answer 3 of 3 questions	week 0 HT	N/A	yes for unassessed option only	1.75
Numerical Linear Algebraic	1.75h inv. exam	best 2 questions count	week 6–8 TT	N/A	no	1
Perturbation Methods	1.75h inv. exam	best 2 questions count	week 6–8 TT	N/A	no	1
Quantum Field Theory	3h inv. exam	answer 3 of 3 questions	week 0 HT	N/A	no	1.5
Quantum Processes in Hot Plasma	homework completion	N/A	N/A	N/A	yes	0.75

## Hilary Term

Unit	Assessment Method	Assessment Instruction	Assessment Date	Submission Deadline	Homework Requirement	Units
Advanced Fluid Dynamics	2h inv. exam <b>or</b> homework completion	answer 2 of 2 questions	week 0 TT	N/A	yes for unassessed option only	1
Advanced Philosophy of Physics (cont'd)	mini-project <b>or</b> homework completion	N/A	titles released Friday wk 4 HT	12:00 Friday week 4 TT	yes for unassessed option only	1.5
Advanced QFT	3h inv. exam	answer 3 of 3 questions	week 0 TT	N/A	no	1.5
Algorithms and Computations in Theoretical Physics	homework completion	N/A	N/A	N/A	yes	1
Applied Complex Variables	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
Collisionless Plasma Physics	take-home exam <b>or</b> homework completion	N/A	exam released Friday wk 8 TT	12:00 Wednesday week 9 TT	yes for unassessed option only	1
Cosmology	2h inv. exam	answer 2 of 3 questions	week 6-8 TT	N/A	no	1
Galactic and Planetary Dynamics	Mini-project <b>or</b> homework completion	N/A	project released Friday wk 8 HT	12:00 Friday week 11 HT	yes for unassessed option only	1
General Relativity II	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
Geometric Group Theory	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
Geophysical Fluid Dynamics	2h inv. exam	answer 2 of 2 questions	week 6-8 TT	N/A	no	1
High Energy Density Plasma Physics	homework completion	N/A	N/A	N/A	yes	1
Introduction to Quantum Information	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
Lie Groups	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
Low Dimensional Topology & Knot Theory	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
Networks	mini-project	N/A	project released Friday wk 8 HT	12:00 Wednesday week -1 TT	no	1
Nonequilibrium Statistical Physics	mini-project <b>or</b> homework completion	N/A	project released Friday wk 8 HT	12:00 Friday week 11 HT	yes for unassessed option only	1
Quantum Matter	2h inv. exam <b>or</b> homework completion	answer 2 of 2 questions	week 0 TT	N/A	yes for unassessed option only	1
Random Matrix Theory	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
Riemannian Geometry	1.75h inv. exam	best 2 questions count	week 6-8 TT	N/A	no	1
String Theory I	mini-project	N/A	project released Friday wk 8 HT	12:00 Friday wk 11 HT	no	1
Supersymmetry and Supergravity	mini-project	N/A	project released Friday wk 8 HT	12:00 Friday wk 11 HT	no	1

## Trinity Term

Unit	Assessment Method	Assessment Instruction	Assessment Date	Submission Deadline	Homework Requirement	Units
Advanced Topics in Plasma Physics	no formal assessment (homework)	N/A	N/A	N/A	yes	0.5
Astroparticle Physics	no formal assessment (homework)	N/A	N/A	N/A	yes	1
Collisional Plasma Physics	no formal assessment (homework)	N/A	N/A	N/A	yes	1
Collisionless Plasma Physics (cont'd)	take-home exam <b>or</b> homework completion	N/A	exam released Friday wk 8 TT	12:00 Wednesday week 9 TT	yes for unassessed option only	1
Conformal Field Theory	no formal assessment (homework)	N/A	N/A	N/A	yes	1
Disorder in Condensed Matter	no formal assessment (homework)	N/A	N/A	N/A	yes	1
Introduction to Topological Phases of Matter	mini-project	N/A	project released wk 6 TT	wk 9 TT	no	1
Machine Learning Fundamentals with Applications to Physics and Mathematics	no formal assessment (homework)	N/A	N/A	N/A	yes	1
Quantum Field Theory in Curved Space	no formal assessment (homework)	N/A	N/A	N/A	yes	1
Renormalisation Group	no formal assessment (homework)	N/A	N/A	N/A	yes	1
String Theory II	no formal assessment (homework)	N/A	N/A	N/A	yes	1
The Standard Model and Beyond I	no formal assessment (homework)	N/A	N/A	N/A	yes	1
The Standard Model and Beyond II	no formal assessment (homework)	N/A	N/A	N/A	yes	1
Topics in Soft and Active Matter Physics	no formal assessment (homework)	N/A	N/A	N/A	yes	0.5

## B Reconciliation Procedure

The Examiners will follow the procedure below when reconciling marks for assessments which are double-blind marked.

1. The two assessors each read the assessment; the assessors independently write reports and produce preliminary marks.
2. If the reports are broadly in agreement and the two assessor marks differ by no more than 10 marks, the Examiners can take the average of the two marks as the provisional mark, symmetrically rounded if necessary (for example, 75.49 will be rounded down and 75.50 will be rounded up).
3. If (2) does not apply, then the Examiners will ask the assessors to confer on the standard of the work with a view to agreeing a mark. E-mail discussions may be sufficient in simple cases, providing nothing is communicated that breaches exam security. The focus will be on identifying the reasons for any difference in the proposed marks.
4. If the two assessors agree on a mark under (3), they report the agreed mark to the Examiners, who will normally take the agreed mark as the provisional mark.
5. If the two assessors cannot agree under (3), they send a summary of the discussion in (3) to the Examiners. The Examiners will appoint a third assessor who will independently assess the project before receiving the marks from the other assessors. The third assessor will make a recommendation to the Examiners.

## C Determination of the overall $\overline{USM}$

An overall average USM will be determined as follows.

Let  $\{c_1, \dots, c_n\}$  be the set of formally assessed courses a student has offered. For each of these courses  $c_i$ , the number of units of the course is denoted by  $u_i$ , the number of units assessed by a written invigilated exam by  $w_i$  (zero if the course does not have a written invigilated exam) and the USM achieved by  $m_i$ . For a subset of these courses, given by an index set  $S \subset \{1, \dots, n\}$ , we define the total number of units,  $|S|$ , the total number of units with written invigilated exam,  $\|S\|$ , and the average USM,  $\bar{S}$ , of this subset by

$$|S| = \sum_{i \in S} u_i, \quad \|S\| = \sum_{i \in S} w_i, \quad \bar{S} = \frac{1}{|S|} \sum_{i \in S} u_i m_i.$$

The average USM ( $\overline{USM}$ ) is then defined according to

$$\overline{USM} = \max_{S: |S| \geq 7 \text{ and } \|S\| \geq 4} (\bar{S}).$$

In words, this amounts to considering all possible subsets of courses offered by the student that satisfy the overall course requirements and taking the maximum weighted (by number of units) average USM amongst all of these subsets.

## D Qualitative Class Descriptors

### D.1 Mini-Project Class Descriptors

Mini-projects will be assessed with reference to the following qualitative descriptors:

70–100 The candidate has demonstrated an excellent understanding of almost all of the material covered with a commensurate quality of presentation and has completed almost all of the assignment satisfactorily, further subdivided by:

90–100 The candidate has shown considerable originality and insight going well beyond the straightforward completion of the task set.

- 80–89 The work submitted shows a near-perfect completion of the task at hand, but does not meet the additional requirements above, or does but has some defects in presentation.
- 70–79 The work submitted is of a generally high order, but may have minor errors in content and/or deficiencies in presentation.
- 60–69 The candidate has demonstrated a good or very good understanding of much of the material, and has completed most of the assignment satisfactorily, without showing the level of excellence expected of the above USM range.
- 50–59 The candidate has demonstrated an adequate understanding of the material and an adequate ability to apply their understanding, without showing the level of understanding expected of the above USM range.
- 40–49 The work submitted, while sufficient in quantity, suffers from sufficient defects to show a lack of adequate understanding or ability to apply results.
- 30–39 The candidate, while attempting a significant part of the mini-project, has displayed a very limited knowledge or understanding at the level required.
- 0–29 The candidate has either attempted only a fragment of a mini-project or has shown an inadequate grasp of basic material.

## D.2 Dissertation Class Descriptors

Dissertations will be assessed with reference to the following qualitative descriptors:

- 90–100 Work of potentially publishable standard, as evidenced by originality or insight. The work should show depth and accuracy, and should have a clear focus. It is likely to go beyond the normal MSc level.
- 80–89 Work in this range will be at the level of a strong candidate for a DPhil applicant. It will have depth, accuracy and a clear focus. It will show a strong command of material at least at the MSc level. It is likely to contain original material, which may take the form of new mathematical propositions, new examples, or new calculations, for example. 8
- 70–79 The work submitted is of a generally high order, with depth, clarity and accuracy, but may have minor errors in content and/or deficiencies in presentation. It may contain original material, at least in the sense of new examples or calculations.
- 60–69 The candidate shows a good grasp of their subject, but without the command and clarity required for first class marks. Presentation, referencing and bibliography should be good, and the mathematics/statistics should have no more than minor errors.
- 50–59 The work shows an adequate grasp of the subject, but is likely to be marred by having material at too low a level, by serious or frequent errors, a high proportion of indiscriminate information, or poor presentation and references.
- 40–49 The candidate shows reasonable understanding of parts of the basic material, but reveals an inadequate competence with others. The material may be at too low a level. There are likely to be high levels of error or irrelevance, muddled or superficial ideas, or very poor writing style.
- 30–39 The candidate shows some limited grasp of at least part of the material.
- 0–29 Little evidence of understanding of the topic. The work is likely to show major misunderstanding and confusion.

## D.3 Overall Class Descriptors

Qualitative class descriptors for overall levels of performance on the course are summarised below.

- **Distinction:** High quality work throughout the course. The candidate shows excellent knowledge of the material over a wide range of topics. The criteria for USMs in the distinction band are:

- 90-100: The candidate shows remarkable ability and true insights. Dissertations in this band will be worthy of publication.
- 80-89: The candidate shows outstanding problem-solving skills and outstanding knowledge of the material over a wide range of topics, and is able to use that knowledge innovatively and/or in unfamiliar contexts.
- 70-79: The candidate shows excellent problem-solving skills and excellent knowledge of the material over a wide range of topics, and is able to use that knowledge innovatively and/or in unfamiliar contexts.
- **Merit:** The merit covers very good quality of work through out the course. The criteria for USMs in the merit band are:
  - 65-69. The candidate shows very good problem-solving skills, and very good knowledge of much of the material over a wide range of topics.
- **Pass:** The pass covers a wide range of results from candidates who show adequate knowledge of most of the material, to candidates who show good knowledge of much of the material over a wide range of topics. The criteria for USMs in the pass band are:
  - 60-64: The candidate shows good problem-solving skills, and good knowledge of much of the material over a wide range of topics.
  - 50-59: The candidate shows basic problem solving skills and adequate knowledge of most of the material.
- **Fail:** The candidate shows an inadequate grasp of the basic material. Candidates may have shown some understanding but the majority of work is likely to show major misunderstanding and confusion, and/or inaccurate calculations.
  - 40-49: The candidate shows reasonable understanding of at least part of the basic material and some problem solving skills. Although there may be some good work, the majority of work will contain errors in calculations and/or show incomplete understanding of the topics.
  - 30-39: The candidate shows some limited grasp of basic material over a restricted range of topics, but with large gaps in understanding. There need not be any good quality work, but there will be indications of some competence.
  - 0-29: The candidate shows an inadequate grasp of the basic material. The work is likely to show major misunderstanding and confusion, and/or inaccurate calculations.