

Mathematical and Statistical Dissertations in
Part C Mathematics
Part C Mathematics & Computer Science
Part C Mathematics & Philosophy
Part C Mathematics & Statistics
M.Sc. in Mathematical Sciences
Guidance Notes

Version 2019/20

Contents

1	Introduction	3
1.1	Timeline for dissertations	3
2	How to choose a dissertation topic	4
2.1	Choosing a CCD Dissertation	4
2.2	Choosing a COD Dissertation	4
3	The amount of work involved	5
4	Supervision	5
5	Format of the dissertation	6
6	Writing mathematics	7
7	Referencing and plagiarism	7
8	Tips for writing a successful dissertation	8
9	Submitting your dissertation	8
9.1	Late submission	9

10 Oral presentations	9
11 Marking of dissertations	10
11.1 Marking criteria	10
11.2 Class descriptors	15
12 Problems and complaints	17
References	18
A Guidance on giving an Oral Presentation	19

1 Introduction

In 2019-20, Mathematics, Mathematics & Computer Science and Mathematics & Philosophy Part C students may opt to offer a mathematics dissertation. For Part C Mathematics & Statistics, students are required to complete a statistics dissertation. All students on the M.Sc. in Mathematical Sciences must complete a dissertation as part of the course and will be able to choose topics from either department.

Both mathematics and statistics dissertations are worth two units and provide students with an introduction to scientific research and the opportunity to obtain skills in collecting, organising and expounding material, both as an extended piece of writing and an oral presentation.

For Mathematics & Philosophy students, there is alternatively the option to complete a Philosophy thesis. For further information, please email the Undergraduate Studies Administrator at the Faculty of Philosophy, James Knight (james.knight@philosophy.ox.ac.uk).

1.1 Timeline for dissertations

Michaelmas Term

Friday 11 October, 10am
(Week 0) Dissertation Information Session
Dissertation abstracts published

Friday 1 November, 12noon
(Week 3) Deadline for submitting dissertation choices

Monday 11 November
(Week 5) Students notified of project allocation

Weeks 7/8 Initial meeting with supervisor

Hilary Term

Weeks 1–8 3 further supervision meetings

Weeks 7/8 Oral presentations take place

Trinity Term

Monday 27 April (Week 1), 12noon Submission deadline

2 How to choose a dissertation topic

Mathematics dissertations can be offered on a mathematical topic (CCD dissertation) or a history of mathematics topic (COD dissertation). CCD dissertations have substantial mathematical content and count as mathematical units. COD dissertations investigate topics in the history of mathematics, and count as ‘other’ units.

Statistics dissertations will have substantial probability/statistics content – i.e. they will be similar to the CCD style of mathematical dissertations.

2.1 Choosing a CCD Dissertation

The list of potential dissertation topics will be published at (<https://www.maths.ox.ac.uk/members/students/postgraduate-courses/omms-part-c/teaching-and-learning/dissertations-10>) on Friday of Week 0 of Michaelmas term, following the Dissertation Information Session. For each potential topic there will be a short abstract outlining the topic, details of prerequisite knowledge, suggested references and possible avenues of investigation. There is a limit on the number of students each supervisor is able to supervise.

You will be asked to submit a ranked list of dissertation choices via an online form at <https://www.maths.ox.ac.uk/members/students/postgraduate-courses/omms-part-c/teaching-and-learning/dissertations-10> by 12noon on Friday of Week 3. You will need to submit 5 choices, and will be given the opportunity to explain if there is a particular reason why you would like to do a specific topic. For example, you may like to undertake a dissertation in an area in which you are hoping to go on to further study.

You are not expected to make contact with the dissertation supervisor(s) before submitting your choices but if you have a question about a dissertation topic you should feel free to email the supervisor for further information.

Projects Committee will meet in Week 4 to decide upon the allocation of dissertation topics and will seek to ensure that students receive one of their top choices as far as possible. You will be notified of which project you have been allocated at the start of Week 5.

2.2 Choosing a COD Dissertation

Students wishing to do a dissertation based on the History of Mathematics should contact Dr Chris Hollings at christopher.hollings@maths.ox.ac.uk by Wednesday of week 1 with a short draft proposal. Dr Hollings will contact you to arrange a short informal interview to discuss the proposal further. All decisions made by Dr Hollings will be communicated to students by the end of week 2.

All proposals supported by Dr Hollings will then be referred to Projects Committee who meet in week 4 for final approval. With the support of Dr Hollings students must submit a COD Dissertation Proposal Form to Projects Committee by the end of week 3. The form can be found on page 18.

Students whose proposal is not supported by Dr Hollings will be given the option to submit a ranked list of dissertation choices via an online form at <https://www.maths.ox.ac.uk/members/students/postgraduate-courses/omms-part-c/teaching-and-learning/dissertations-10> by 12noon on Friday of week 3. You will need to submit 6 choices, and will be given the opportunity to explain if there is a particular reason why you would like to do a specific topic.

3 The amount of work involved

A dissertation is worth two units, and should therefore be equivalent to two sixteen-hour lecture courses. Accordingly you might think of the project as being the equivalent of half a term's work. If some preparation has been done in Michaelmas term it should occupy approximately a quarter of your working time during the Christmas vacation, Hilary term and Easter vacation.

4 Supervision

You will have a supervisor for your dissertation and will meet with them 4-5 times during Michaelmas and Hilary terms, together with the other students offering that dissertation topic. The group size will be between 1 and 4 students.

The first meeting will take place in Weeks 7 or 8 of Michaelmas term to provide you with the information you need to start work on your dissertation over the Christmas vacation and to agree the pattern of project supervision in Hilary term. At the meetings in Hilary term, you should expect to update your supervisor on the work you have done since the last meeting, and can highlight any difficulties you have encountered. Your supervisor will provide you with suggestions on how to overcome difficulties and may direct you to relevant literature. Supervisors will not read a draft of your dissertation but will provide you with advice on writing mathematics if needed.

Supervisors are asked to keep a log of the amount and nature of project supervision that they give and this will be made available to the second assessor marking the dissertation. Your supervisor will be one of two assessors for the dissertation. Further information about the marking of dissertations can be found in section 11.

5 Format of the dissertation

The assessors give credit for qualities such as content, accuracy, organisation, clarity and style. The final dissertation should be no longer than 7,500 words, this usually equates to 25–30 pages. The word count may exclude any table of contents, all mathematical equations and symbols, diagrams, tables, bibliography and the texts of computer programs. However any preface, footnotes, and appendices must be included. Where projects contain a substantial amount of programming, candidates are encouraged to include key elements of their commented code in an appendix to the dissertation. This appendix will not contribute towards the word-count.

Students will need to self-certify the word length of their project, and must specify how the word-count was produced. Guidance on how to count words in a latex documents can be found on the Maths Institute website: <https://www.maths.ox.ac.uk/members/it/faqs/latex/word-count>. Assessors may penalise overlong dissertations, particularly if they feel the dissertation is overlong through verbosity or irrelevant content, or if the dissertation is particularly overlong.

Dissertations must be word-processed. For CCD/statistics dissertations they must be prepared using \LaTeX , or some other dialect of \TeX . For COD dissertations other appropriate packages may be used. **A short course on the use of \LaTeX will be offered in Michaelmas Term** (see the lecture list on Mathematical Institute website for the time). The references section gives details of a standard text book for \LaTeX (Lamport [6]), and an excellent online guide is The Not So Short Introduction to $\text{\LaTeX}2\text{e}$ [8].

You can apply for an IT account to enable you to use the computers in the study room for work on the dissertation. The computer account application form is available online at: <http://www.maths.ox.ac.uk/members/it/it-facilities-access>. If you would like a departmental IT account, you will need to return the completed form to Academic Administration (acadadmin@maths.ox.ac.uk).

If you are doing a statistics dissertation, you can apply for a statistics computer account to use in connection with your dissertation you should contact: academic.administrator@stats.ox.ac.uk

The presentation of the submitted essay or dissertation should conform to the following points.

- The dissertation must be word-processed and have a font size of 12pt.
- The text may be single spaced and the dissertation printed double-sided.
- The dissertation should be spiral-bound or soft-bound.
- The dissertation should have a title page which includes the following:

- the title of the dissertation,
 - the candidate’s examination number,
 - the title of the candidate’s degree course,
 - the term and year of submission.
- The dissertation should not contain any information which could be identifying, such as a student’s name and college.

6 Writing mathematics

Students should put effort into presenting their work as clearly as possible. The paper by Ehrenberg [1] is only 4 pages long and contains good advice on technical writing. Strunk and White [11] is a guide to writing more generally. Katzoff [3] is an older report on technical writing.

Excellent brief advice on mathematical writing is to be found on the London Mathematical Society website [7]. The book by Higham [2] gives very good tips on writing mathematics. The book of Krantz [5] is also recommended, as is the older book by Steenrod, Halmos, Schiffer and Dieudonne [10]. Section 1 of Knuth, Larrabee and Roberts [4] is a mini-course on technical writing and there is plenty of good advice in the rest of the book too.

Students should remember to back up all the files relating to their work regularly. This includes not only the codes used to generate results but also the drafts of the dissertation. This will be done automatically for students who are working on the Mathematical Institute or Statistics Department computer networks.

The final dissertation should be a clear and well-reasoned account of the project. It is not necessary to include everything that has been learnt, only what is relevant. There is no point in writing out in great detail things that are well known (references should be used) but the dissertation should be able to be read and understood as it stands.

It is possible to look at some past dissertations on the web at <https://www.maths.ox.ac.uk/members/students/undergraduate-courses/teaching-and-learning/projects/project-archive> (note that you will have to log in to the website first).

7 Referencing and plagiarism

It is most important that a dissertation is your own work and thus all sources should be carefully referenced in order to avoid plagiarism. The University’s policy on plagiarism is available online at <http://www.ox.ac.uk/students/academic/guidance/skills/plagiarism>.

The London Mathematical Society's advice to its authors [9] gives advice on how to reference the work of others and explains a common referencing system. The conventions for citing internet resources include stating the URL and date accessed.

8 Tips for writing a successful dissertation

Responsibility for the dissertation lies with the student and you should take a proactive approach to completing your dissertation. Below are some tips on writing a successful dissertation.

- Manage your time wisely. You should have a clear plan for when and how you will work on your dissertation project across the Christmas vacation, Hilary term and the Easter vacation. Avoid leaving writing up your dissertation to the last minute.
- Structure your dissertation write-up with a reader in mind. Ensure that it has a clear beginning, middle and end.
- Proof-read your dissertation before you submit it. Make sure you have defined all the notation and terms that you use.

9 Submitting your dissertation

You should submit two hard copies of your dissertation to the Examination Schools by 12noon on Monday of Week 1, Trinity term. These should be submitted in an envelope addressed, as appropriate, to:

Chair of Examiners for the M.Sc. in Mathematical Sciences

Chair of Examiners Mathematics Part C

Chair of Examiners Mathematics & Computer Science Part C

Chair of Examiners Mathematics & Philosophy Part C

Chair of Examiners Mathematics & Statistics Part C.

You should also write your candidate number on the front of the envelope in the top right corner. The copies of the dissertation should be accompanied by a completed Declaration of Authorship sheet which states that the dissertation is

the student's own work and has not been previously submitted for assessment. The declaration form can be found at <https://www.maths.ox.ac.uk/members/students/postgraduate-courses/omms-part-c/teaching-and-learning/dissertations>.

No dissertation will be accepted if it has already been submitted, wholly or substantially, for a degree at the University of Oxford, or for a degree of any other institution. Students should also submit a soft copy (pdf file) of their dissertation by the same deadline. This will then (with the student's consent on the declaration form) be submitted to the turnitin plagiarism system. Further information on how to submit the soft copy will be circulated in the Notice to Candidates later in the academic year.

9.1 Late submission

It is vital that you submit your work by the given deadline as any late submission will be reported to the Proctors and a late submission penalty may be applied. The late submission penalty tariff is set out in the examination conventions available at

<https://www.maths.ox.ac.uk/members/students/postgraduate-courses/omms-part-c/examinations-and-assessments/part-c-and-omms>

and

<https://www.stats.ox.ac.uk/student-resources/bammath/examinations/>

Please see the examination conventions and the Oxford Student website (<http://www.ox.ac.uk/students/academic/exams/submission>) for advice on what to do if you are unable to submit your work on time due to medical emergency or other urgent cause.

10 Oral presentations

Each student is required to give an oral presentation to their supervisor and at least one other person with some knowledge of the field of the dissertation. This presentation forms no part of the final assessment of the project. It is intended to give you an opportunity to practise your presentation skills and for your supervisor to test, through questioning, your understanding of the material included in the project. It is intended that the presentations will be delivered near the end of Hilary Term. For further information, please see Appendix A.

11 Marking of dissertations

The dissertation will be read and double blind marked by your supervisor and another assessor. When writing your dissertation, you should be aware of how it will be assessed and marked.

Marks are awarded in the following proportions for CCD dissertations:

Mathematical Content 50%; Content 25%; Presentation 25%.

For COD dissertations marks are awarded in the following proportions:

Content 75%; Presentation 25%.

Dissertations will be assessed according to the following marking criteria and class descriptors.

11.1 Marking criteria

CCD Dissertations

50% Mathematical Content

20% Difficulty

16-20 The conceptual demands of the material go well beyond that expected and the scope of the project's aims are ambitious.

12-15 The conceptual demands of the material are largely as expected of a project and the scope of the project's aims range appropriately.

9-11 The conceptual demands of the material are below that expected or the scope of the project's aims are limited and less than expected.

0-8 The conceptual level of the material is significantly below that expected and the scope of the project is narrow and unambitious.

20% Correctness

16-20 The mathematical content of the project is invariably correct – as relevant this means that theorems are rigorously stated and proved and/or mathematical/statistical modelling is reasonable and justified and/or the choice of statistical and/or computational methods is appropriate and efficient.

12-15 There are minor errors with the mathematical content – this may involve some slips or omissions with rigour when stating or proving theorems, imperfect or somewhat simplistic modelling or the statistical or computational methods could be improved upon without difficulty.

9-11 There is a significant error of omission or misunderstanding with the mathematical/statistical content of the project or a significant weakness in an important model or the statistical or computational methods are inappropriate or inefficient.

0-8 There are repeated errors of some substance with the mathematical/statistical content or modelling involved in the project or the choice of statistical or computational methods are wholly inappropriate or very inefficient.

10% Comprehensiveness

8-10 The coverage of the project's themes is comprehensive and in depth, beyond what would normally be expected.

6-7 The coverage of the project's themes is largely comprehensive with the main theorems, methods and examples included.

4-5 The coverage of the project's themes is somewhat lacking, with the occasional omission of standard results or examples.

0-3 Significant results or themes within the scope of the project are omitted.

25% Content

10% Coherence

8-10 Overall the project's content has a superb coherence, certainty of direction, with the aims of the project being clear, main results well addressed and the conclusions well presented.

6-7 Overall the project's content coheres well, with the scope and aims of the project being clearly addressed.

4-5 The direction of the project is occasionally unclear, with the presence of some results or examples sometimes at odds with other material.

0-3 The project lacks coherence overall, with a sketchiness to its larger conception.

15% Individuality

12-15 The project is highly novel in its conception, and something completely original to the literature. It would make good recommended reading for an undergraduate interested in the project's topics.

9-11 The project is individual in its conception, with a good range of references.

6-8 The project overall is somewhat unimaginative and derivative in its aims. The range of references is a little narrow.

0-5 The project overall is rather derivative in nature, showing little imagination.

25% Presentation

10% Narrative

- 8-10 The project is superbly readable with an inviting style and well motivated in its direction, populated with well chosen examples and/or historical context.
- 6-7 The project is easy to read with the different themes linking naturally.
- 4-5 Poorly motivated and somewhat jarring turns in the narrative occasionally appear.
- 0-3 The project makes for difficult reading, with an unclear direction and poorly motivated material.

15% Clarity

- 12-15 The clarity of explanation is superb with ideas carefully, roundly introduced; the effort made for the benefit of the reader is obvious. Language is well chosen and never verbose. References are particularly well chosen and carefully cited. Notation is transparently introduced and important equations are clearly displayed.
- 9-11 The explanation is clear with any new definitions carefully introduced. The language is unambiguous. Referencing is carefully done. Notation is transparently introduced and important equations clearly displayed.
- 6-8 The explanation is occasionally opaque/ambiguous or crucial/necessary definitions are either omitted or difficult to find. References and/or referencing is somewhat minimal. Care is occasionally not taken displaying mathematics.
- 0-5 The explanation is commonly vague and poorly referenced. Commonly notation is poorly chosen and/or equations hidden amongst text. References and/or referencing is poor.

COD Dissertations

75% Content

20% Difficulty

- 16-20 The conceptual demands of the material go well beyond that expected and the scope of the project's aims are ambitious. The project requires nuanced understanding in various contexts.
- 12-15 The conceptual demands of the material are largely as expected of a project and the scope of the project's aims range appropriately, requiring subtle appreciation of some topics.

9-11 The conceptual demands of the material are below that expected or the scope of the project's aims are limited and less than expected. The project requires relatively straightforward understanding of topics.

0-8 The conceptual level of the material is significantly below that expected and the scope of the project is narrow and unambitious.

20% Correctness

16-20 The factual content of the project is invariably correct – as relevant this entails accurate statements of theorems and veracity of mathematics, logical conclusions and argument drawn from references, awareness of historical detail and context, correct appreciation of current educational theory, handling of data, etc..

12-15 There are minor errors with the mathematical content – this may involve some minor slips with theorems and proofs, logical conclusions and argument drawn from references, historical detail or context, current educational theory, handling of data, etc..

9-11 There is a significant error involving omission, misunderstanding, invalid logical argument, misappreciation of historical context or educational theory, analysis of data etc..

0-8 There are repeated errors of some substance within the project.

10% Comprehensiveness

8-10 The coverage of the project's themes is comprehensive and in depth, beyond what would normally be expected.

6-7 The coverage of the project's themes is largely comprehensive with the main theorems, methods, examples, ideas, developments, historical figures, educational theory, etc. included as appropriate.

4-5 The coverage of the project's themes is somewhat lacking, with some standard/canonical ideas, points of view, themes, historical figures or examples omitted or tangentially addressed.

0-3 Significant themes or topics of interest within the scope of the project are omitted.

10% Coherence

8-10 Overall the project's content has a superb coherence, certainty of direction, with the aims of the project being clear, main results well addressed and the conclusions well presented.

6-7 Overall the project's content coheres well, with the scope and aims of the project being clearly addressed.

4-5 The direction of the project is occasionally unclear, with the presence of some results or examples sometimes at odds with other material.

0-3 The project lacks coherence overall, with a sketchiness to its larger conception.

15% Individuality

12-15 The project is highly novel in its conception, and something completely original to the literature. It would make good recommended reading for an undergraduate interested in the project's topics.

9-11 The project is individual in its conception, with a good range of references.

6-8 The project overall is somewhat unimaginative and derivative in its aims. The range of references is a little narrow.

0-5 The project overall is rather derivative in nature, showing little imagination.

25% Presentation

10% Narrative

8-10 The project is superbly readable with an inviting style and well motivated in its direction, populated with well chosen examples and/or historical context.

6-7 The project is easy to read with the different themes linking naturally.

4-5 Poorly motivated and somewhat jarring turns in the narrative occasionally appear.

0-3 The project makes for difficult reading, with an unclear direction and poorly motivated material.

15% Clarity

12-15 The clarity of explanation/argumentation is superb with ideas carefully, roundly introduced. The effort made for the benefit of the reader is obvious. Language is well chosen and never verbose. References are particularly well chosen and carefully cited. Any mathematics/figures are clearly displayed.

- 9-11 The explanation is clear with any new ideas/themes/points of view carefully introduced. The language is unambiguous and transparent. Referencing is carefully done. Any mathematics/figures are clearly displayed.
- 6-8 The explanation/argumentation is occasionally opaque/ambiguous or involves omissions. References and/or referencing is somewhat minimal. Care is occasionally not taken displaying mathematics/figures.
- 0-5 The explanation is commonly vague and poorly referenced. References and/or referencing is poor.

11.2 Class descriptors

CCD Dissertations

- 90–100 Work of potentially publishable standard, as evidenced by its clear individual narrative and insight. The work should show depth and accuracy, and should have a clear focus. It is likely to go beyond the normal level. The standard one sees in winners of one of the examination prizes.
- 80–89 Work in this range will be at the level of a strong candidate for a DPhil applicant. The project will be an easy choice as a winner of a college essay prize. It will have depth, accuracy and a clear focus. It will show a strong command of material. It is likely to contain original material, which may take the form of new mathematical propositions, new examples, or new calculations, for example.
- 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 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.

COD Dissertations

70–100 The candidate shows clear focus on the question, with precise and accurate details (mathematical and other), imaginative selection of examples and appropriate selection and quality (rather than quantity) of sources, and cogent argument, supported by evidence.

Within this band the following finer gradations may be helpful:

- 90–100 A polished work of high individuality, well researched and of potentially publishable quality (in a gazette of a professional society say).
- 80–89 Demonstrates strong individuality of content or insight. Would be an appropriate entry for a national or university prize.
- 70–79 Work of high or very high quality, but perhaps lacking the originality that would be expected of publishable work. Might be a good candidate, for example, for a college prize.
- 60–69 Work that addresses the given topic, with solid command of factual content, reasonable range of examples and sources, coherent argument and analysis, and correct referencing and bibliography.
(Essays at the lower end of this range may lack some of these qualities or show them only intermittently.)
- 50–59 Work with some use of facts, sources, and arguments, but marred by one or more of a failure to address the topic, serious or frequent errors of fact, a high proportion of indiscriminate information, speculation or unsupported argument, and incomplete or inaccurate referencing.
- 40–49 The candidate shows some knowledge of the topic but the work is marred by several of the following:- high levels of error or irrelevance, muddled or superficial ideas, incoherent or non-existent argument, incompetent use of sources, or very poor writing style.
- 30–39 The work demonstrates a little knowledge of the topic but no coherent argument.
- 0–29 The work demonstrates almost no knowledge of the topic.

12 Problems and complaints

Students who experience any problems with their project at any point should ensure they discuss this with their supervisor as soon as possible. If they feel unable to approach their supervisor, they should contact their college tutor, the Director of Undergraduate Studies (Part C students)/Course Director (OMMS students) or one of the academic administration team in the first instance.

If a student wishes to make a formal communication to the examiners relating to their dissertation, then it must be stressed that in order to preserve the independence of the examiners, they are not allowed to make contact directly. Any communication must be via the Senior Tutor of their college, who will, if they deem the matter of importance, contact the Proctors. The Proctors in turn communicate with the Chair of Examiners. Students who have any queries about the examinations or anything related to the examinations, for example, illness, personal issues, should not hesitate to seek further advice from their college tutor, from the Director of Undergraduate Studies (Part C students)/Course Director (OMMS students) or from one of the academic administration team.

References

- [1] A. S. C. Ehrenberg, *Writing Technical Papers or Reports*, The American Statistician **36** (1982), no. 4, 326–329. <http://www.jstor.org/stable/2683079?origin=JSTOR-pdf>.
- [2] N.J. Higham, *Handbook of Writing for the Mathematical Sciences*, SIAM, 1998.
- [3] S. Katzoff, *Clarity in Technical Writing*, Second Edition, NASA, 1964. https://archive.org/details/nasa_techdoc_19640016507.
- [4] D. E. Knuth, T. Larrabee, and P. M. Roberts, *Mathematical Writing*, Mathematical Association of America, 1989. Available at <http://tex.loria.fr/typographie/mathwriting.pdf>.
- [5] S. G. Krantz, *A Primer of Mathematical Writing*, American Mathematical Society, 1997.
- [6] L. Lamport, *L^AT_EX: A Document Preparation System*, Second Edition, Addison Wesley, 1994.
- [7] London Mathematical Society, *Writing Mathematics*. <http://www.austms.org.au/Publ/Bulletin/writing.pdf>.
- [8] T. Oetiker, H. Partl, I. Hyna, and E. Schlegl, *The Not So Short Introduction to L^AT_EX2_ε*. <http://www.ctan.org/tex-archive/info/lshort/english/lshort.pdf>.
- [9] Sue Rodd and Ola Törnkvist, *Journals of the London Mathematical Society: house style and instructions for copy-editors and typesetters*. <http://www.lms.ac.uk/sites/lms.ac.uk/files/Publications/LMSHouseStyle.pdf>.
- [10] N. E. Steenrod, P. R. Halmos, M. M. Schiffer, and J. R. Dieudonné, *How to Write Mathematics*, American Mathematical Society, 1973. Second Edition, 1981.
- [11] W. Strunk Jr. and E. B. White, *The Elements of Style*, Fourth Edition, Longman, 1999. First Edition, 1918 available at <http://www.bartleby.com/141/>.

A Guidance on giving an Oral Presentation

Each student is required to give an oral presentation to their supervisor and at least one other person with some knowledge of the field of the dissertation. These will usually take place in the final two weeks of Hilary Term. The presentation does not count towards the final assessment of the dissertation, however, it will give you an opportunity to consolidate the material you have covered and to practise your presentation skills and you will receive feedback on your talk afterwards.

The presentation should last approximately 25 minutes and you should aim to talk for at most 15 minutes, leaving the remaining time for questions and discussion. Since the presentations do not form part of the final assessment for the dissertation you are not required to wear subfusc. Your supervisors will advise you whether you may attend other students' talks on a similar topic.

After you have given your presentation there will be time for questions and discussion. This will give chance to your supervisor to test, through questioning, your understanding of the material included in the project. This should help to clarify the structure of your dissertation and the level of details required.

You may prepare slides for the presentation. Since you are likely to have mathematical equations in the presentation, LaTeX is recommended. There are various LaTeX classes for creating slides including the beamer class. A sample file using the beamer class can be downloaded from <https://www.maths.ox.ac.uk/system/files/attachments/PresentationTemplate.zip>. An alternative to using slides is to give a presentation on the whiteboard. This will require a similar level of preparation to writing slides and you will still need to decide carefully in advance exactly what points you wish to make on the whiteboard.

Before writing the presentation it is worth writing an outline of the talk in the form of a few bullet points to make clear what you will cover. You should describe the problem you have studied and why it is interesting. One model for the remainder of the talk is to describe the methods you have used to approach the problem and your key results and conclusions. Remember that it is not necessary to describe all the work you have done; in fact this will likely be impossible within the time limit. Your audience will appreciate a coherent description of a portion of your work much more than a high speed and difficult to follow presentation of all that you have done. It is appropriate to aim the level of your talk at a fellow OMMS/Part

C student doing a similar selection of courses but not having specialised in the topic of the dissertation.

How many slides you prepare is partly down to subject area and personal preference. If you have more than one slide per minute, you almost certainly have too many. However, up to 15 slides may be appropriate if you have a lot of figures and results that can be discussed fairly quickly. Regardless of how many slides you have, it is sensible to prepare the key points you would like to make about each slide and then practise to check the presentation takes about the right amount of time. Similarly if you plan to give a whiteboard presentation, you should practise this in advance to check you have enough time to write and discuss everything you intend.

When you make the slides you should ensure the font size is large enough to read from a distance and that there is not too much information on each slide. It is recommended that you avoid fancy backgrounds and special effects (e.g. moving type) as these tend to distract the audience. Overlays (where parts of the slide are revealed at once) can be effective if used relatively sparingly.

Giving proper credit for any material copied or adapted from other sources is just as important in a presentation as it will be in your final dissertation. In particular remember that if you include a figure in your talk that you did not generate yourself, then you must state where it came from. Text taken from other sources must of course also be appropriately quoted and cited – for Oxford’s policy on plagiarism, see <https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism?wssl=1>.

When you give the talk remember to face the audience and speak clearly. Make sure you explain the key points on each slide and be sure you explain the important features to pick out from figures and tables of results. Avoid reading from a script: the commentary may be a little less perfect this way, but it is usually more natural and engaging which helps to retain audience interest.

The presentation will give you a chance to step back from the minutiae of your dissertation to think about how its overall impact and narrative (or that of a section) is going. This should be a useful opportunity ahead of completing the writing up.

COD Dissertation Proposal Form

Oxford University: Mathematical Institute
COD DISSERTATION PROPOSAL FORM
APPLICATION TO THE PROJECTS COMMITTEE

**READ THE RELEVANT EXAMINATION REGULATIONS
FIRST**

Your name (BLOCK CAPITALS)

Your supervisor's name (BLOCK CAPITALS)

The title of your project (BLOCK CAPITALS)

.....
.....

Your email address

Your college (BLOCK CAPITALS)

Your course

For Part C students only

(a) Please specify the courses you offered for examination in Part B

.....
.....
.....

(b) Did you offer an extended essay? If so, what was its title?

.....

Insert here a typed, short (at least 150 words) description of the project, which should give a little background to the topic and describe what you are going to do. Please also include references.

Obtain here a statement of approval and a recommendation from the supervisor of the project.

Approval: (please continue on a separate sheet if necessary).

Recommended Assessors:

Signed (Supervisor):

Date:

Signature of College Tutor:

Date:

Return the form in a sealed envelope to Gemma Proctor, Deputy Academic Administrator in the Mathematical Institute no later than 12noon on Friday of 3rd week of Michaelmas Term. Keep a copy yourself.

All applications are acknowledged. If you have not received an email confirming the receipt of you application within four working days of getting it to the Mathematical Institute, please contact Gemma Proctor by emailing gemma.proctor@maths.ox.ac.uk.