

Guidance Notes for Dissertations 2018/19

M.Sc. in Mathematics and Foundations of Computer Science

The MFoCS *Handbook* has information on choosing your dissertation topic and the role of the supervisor. This document provides supplementary information on preparing your dissertation and should be read in conjunction with the *Handbook* and *Exam Conventions*.

You can look at some past M.Sc. dissertations on the web by using the Mathematical Institute eprints archive. Go to <http://eprints.maths.ox.ac.uk> and select "Browse by Type" in the top menu to look at theses, although note that the majority of these are from the Mathematical and Computational Finance MSc. course.

Proposal and Supervision

Your dissertation supervisor will guide you while you are preparing and writing your dissertation. Normally, students "find" their dissertation supervisor before the end of Hilary term so that they can start some specialised reading after completing that term's mini projects, and before the beginning of Trinity term.

At the beginning of that term, you should prepare a dissertation proposal with your intended dissertation supervisor and submit it to the Course Administrator by noon on Friday week 2 of Trinity Term for approval by the Course Director. These should include the title and brief statement of the form and scope of your dissertation, together with the name of the person who has agreed to act as your supervisor. You are permitted to fine-tune your title after you submit the proposal but must inform the Course Administrator.

It is normal to have around eight meetings with your dissertation supervisor, mainly during Trinity term, but possibly continuing into July, but the exact arrangements are made mutually. Your supervisor will read and provide feedback on the initial draft of your dissertation (provided that it is submitted to them in good time!).

Your dissertation supervisor should normally be based in the Mathematical Institute, the Department of Computer Science or the Department of Statistics; if you are considering a potential supervisor outside these departments or outside Oxford, you should consult the Course Director at an early stage. Also, if work on your dissertation should require you to work out of Oxford at any point during Trinity term, you must consult the Course Director before making any arrangements.

Presentation of Dissertation Topic

Students are required to give a short presentation to their classmates and to members of the Supervisory Committee on their dissertation proposals during week 8 of Trinity term.

Information on assessment and marking

The dissertation will be read and marked by two assessors, one of which is usually your lead dissertation supervisor. The assessors for the viva voce examination will include at least one internal and one external examiner. The dissertation and viva will be given a combined USM with a weighting of three mini-projects. Whilst the dissertation need not necessarily contain original research to pass, the USM

will include credit for originality and will take into account performance in the viva. The final mark for the dissertation will be decided by the examiners, after further consultation with the assessors if necessary. If these examiners are not able to agree a mark initially, there will be a more detailed discussion of the dissertation and viva voce examination which will lead to an agreed mark with the input of other examiners if necessary.

The assessors will give credit for qualities such as content, mathematics and presentation. Here is a brief explanation of these terms:

- Content: the examiners are looking for some of a student's own thoughts and contributions: students must do more than rehash text books and lecture notes; they should use original sources and must not plagiarise.
- Mathematics: proofs and assertions should be correct, and the mathematics should be appropriate for the level of study. In applied topics, the derivation of the model should be properly justified.
- Presentation: the mathematics must be clear and well laid out; the English should be clear and grammatically correct; sources should be properly acknowledged, references should be properly cited. Students should give some thought to notation, choice of typeface, and numbering of equations and sections and the pages should be numbered. Students should be sure to supply complete and accurate references for all the sources used in completing the project, and be sure to cite them properly in the text.

There is always a risk that a project might not succeed, especially if the original plan had involved significant original research. Although this is a rare occurrence, examiners are aware of the possibility. They accept that a well-written account of the work done, with an explanation of why the original aims were not met, can nevertheless be worthy of high credit.

Excellent brief advice on mathematical writing is to be found on the London Mathematical Society website <http://www.lms.ac.uk/sites/lms.ac.uk/files/Publications/LMSHouseStyle.pdf>

Although there are some small differences between American and British styles, the book *A Primer of Mathematical Writing* by Steven G. Krantz, published by the American Mathematical Society (1991) is also recommended, as is the older *How to write Mathematics* by N. E. Steenrod, P. R. Halmos, M. M. Schiffer and J. Dieudonné, American Mathematical Society (1973). Supervisors may recommend papers which illustrate good practice in writing mathematics and in citing sources.

For referencing several conventional systems are in use. Under most conventions the bibliography is listed in alphabetical order of surname of the first author. One convention labels items serially by number; another uses some form of abbreviation of authors' names for labels; in another an item would be referred to by the author's name and the year of publication (Gauss [1801], for example). The London Mathematical Society's advice to its authors at <https://www.lms.ac.uk/sites/lms.ac.uk/files/Publications/lms2eau1.pdf> explains a common version of the first system.

Plagiarism

Plagiarism is presenting someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition. Plagiarism may be

intentional or reckless, or unintentional. Under the regulations for examinations, intentional or reckless plagiarism is a disciplinary offence.

Please see the University's guidance on plagiarism

<http://www.ox.ac.uk/students/academic/guidance/skills/plagiarism> for further information.

Practicalities

Please remember to back up all the files relating to your work (this is done automatically for you if you are working on the Mathematical Institute computer network). It is very important not to leave the final details of your dissertation to the last minute. You should show your supervisor a final draft at least two weeks before the deadline for handing in.

The preferred length is between 35 to 65 pages. The dissertation must be typed, and it is recommended (though not obligatory) that LaTeX be used. You are advised to become familiar with this during the year if you are not already fully conversant with another word processing package that can handle mathematical formulae (and diagrams).

Select an easily readable font, such as Times New Roman or Arial. Font size 12pt is preferred, but a minimum font size 11pt is recommended for text and 10pt for footnotes. The typing should follow the guidance for a research thesis: <https://www.ox.ac.uk/students/academic/exams/research>. You may find the OCIAM thesis class for LaTeX a helpful starting point. It can be downloaded from <https://www.maths.ox.ac.uk/members/it/faqs/latex/thesis-class>.

The title page of your dissertation should include your candidate number, the title of your work, your degree course, the term and year of your submission. **Do not put your name anywhere on your submission.**

The dissertation does not require a separate abstract. However, it is strongly recommended that a short abstract (of less than one page) be included at the beginning of the dissertation, separate from the Introduction. This abstract may, but need not, be that submitted to the Chairman of the Supervisory Committee for prior approval (though these will have been made available to the Chair of Examiners along with the title of the dissertation). Please highlight the novel contributions made in the dissertation within this abstract.

Your dissertation may be printed double-sided and you should use a colour printer if your dissertation contains colour figures. Remember that many people may be printing dissertations prior to the deadline so allow enough time for this. The dissertations should be submitted with the pages securely held together with a soft binding. Loose leaves in ring binders or held together by staples or paper clips are not acceptable. Reception will be able to assist with this if required but will need at least 24-hours' notice.

Submission details

You will be sent detailed information on hard copy and electronic submission in the form of a *Notice to Candidates*.

Vivas

Vivas will be held on Wednesday 18th, Thursday 19th and Friday 20th September. Each viva lasts for half an hour and the timetable will be available nearer the time. You must wear sub fusc. You should expect at least two examiners to be present at your viva. You are required to bring a copy of your dissertation with you. You will be expected to give a 10-15 minute presentation on the dissertation and the examiners may ask questions throughout. The viva is an oral examination and you are not permitted to use presentation slides or any notes, though use of the whiteboard is permitted.

Archiving your dissertation

We will electronically archive the dissertations online so that they can be used by future MSc students. These will only be accessible from within Oxford (i.e. via a password protected webpage) but let the course administrator know if you are not willing for your dissertation to go in this archive.