

MSc in Computational Mathematical Finance and MSc in Financial Modelling and Optimization Dissertation

Overview

During the period from June to August, candidates for the MSc work on a project on an approved topic and write a dissertation based on this work. The project gives the student the opportunity to apply skills developed earlier in the programme to real problems in Computational Mathematical Finance and Financial Mathematics and Optimization. Projects either take the form of an industrial research project with a sponsoring organisation or an academic project on a topic within the field of financial mathematics or stochastic analysis.

Students are strongly encouraged to seek the opportunity to do their project in collaboration with an outside partner in a financial institution (e.g. investment bank, hedge fund, asset manager or a fintech company) which is able to provide a research project where financial mathematics skills are needed. A wide variety of such organisations provide work based projects through the Scottish Financial Risk Academy (SFRA). Students may also find their own work based project (for example by applying for an internship). Projects need to be approved by the Project Coordinator, Stefan Engelhardt, to ensure they are suitable for an MSc. More detailed information will be provided in Semester 2.

If the industrial partner requires confidentiality then the dissertation can be treated as confidential. However this must be arranged by informing the Project Coordinator at the start of the project. This arrangement must be approved by the program director and dissertation organizer by the end of June. Confidential dissertations will be read by the Academic Supervisor and examiners, but will not be available for reference.

Here is a list of different types of dissertations. This list is not exhaustive, nor are the entries mutually exclusive; it is just meant to give some ideas about what makes an acceptable dissertation.

- A theoretical essay that describes, in considerable depth, some piece of mathematical theory relevant to finance. Papers in research journals are often very terse and assume a lot of prior knowledge on the part of the reader; an acceptable project could be to explain a recent paper, fill in details, making its results more accessible and putting them in wider context.
- A numerical project would describe and implement one or more numerical methods for pricing, hedging or reserving for derivatives or portfolios, and perhaps aim to measure how well it performed using real or simulated data.
- A subject review surveys a chosen area, summarising the research literature and providing an overview of its development, importance, methodology and outstanding problems.
- A data-based project would analyse market or other data, fitting them to suitable models and drawing conclusions.

Prior to the final assessment of the taught component of the MSc programme, all students are considered as MSc candidates. Following the Board of Examiners meeting in June, students who complete the taught component at MSc level proceed to the dissertation stage of the MSc programme. The award of the MSc degree thereafter depends solely on the achievement of a dissertation mark of at least 50%.

It is the responsibility of each MSc candidate to prepare a dissertation on a subject chosen by agreement with a member of staff who will act as an Academic Supervisor. Dissertation topics will be agreed by mid-May. Detailed work will be carried out during the months of June, July and August, with sufficient time

being allocated to writing up the dissertation. In many cases the research for the dissertation will involve working with an outside organisation for at least part of the summer months.

To avoid delays all MSc students “conditionally progress to dissertation” so that they can start their projects on time. This means that all MSc students should start working on their MSc project on 3rd June. It doesn’t mean that students “progress to dissertation” for purposes of their degree requirements; this will be decided at the progression board.

Once the progression results become available later in the summer, we will contact those who have failed to progress to dissertation due to their exam performance and explain what next steps they will need to take.

The dissertation must be submitted online via “Learn” by 23rd August 2024 (4pm UK time)

Dissertations are read by two internal examiners before being reviewed by the External Examiner.

You are strongly advised to keep your dissertation on OneDrive or other cloud storage which has version control. Do not to use only a local drive or a USB pen drive for this purpose since they are easily lost or damaged. No compensation or extension will be given for work or data lost due to any kind of computer failure.

Role of the academic supervisor

- The Academic Supervisor will give advice on the subject area, relevant literature, presentation format, methodology, structure of the dissertation, and scheduling of the work to be done. The final responsibility for the dissertation always lies with the student. Advisers are not expected to read and amend chapters, but they may require periodic progress reports and may give advice on sample text. The responsibility for the quality and content of a dissertation lies with the author of the dissertation.
- Academic staff acting as Academic Supervisors cannot be expected to be available at all times, especially during the summer period. Meetings should be arranged between Academic Supervisors and students about once per week in the first half of the project period and once every two weeks in the second half.
- In the case of projects based in an outside organisation, students should meet with their Academic Supervisors for two to three times during the period to update the progress of the dissertation. Their role in this case is to ensure the project will fit within the guidelines for an MSc dissertation. They are not expected to be experts on the topic of interest to the industrial partner.
- Students may ask their Academic Supervisors to read a draft of part of the dissertation, but it is up to the Academic Supervisor's professional judgement as to how much of the dissertation he or she is willing to read. Clearly, an Academic Supervisor cannot examine a dissertation before it is formally submitted and any comments which an Academic Supervisor makes on a draft are provisional in that the Board of Examiners may come to a decision which differs from that of the Academic Supervisor.

Assessment criteria

All dissertations are expected to conform to the following standards:

- The dissertation must add to the understanding of the dissertation subject.
- The dissertation must show awareness of the relevant literature.
- The dissertation must contain relevant analysis: an informed description of a problem is not sufficient.

- The dissertation must be presented using a satisfactory standard of English.

Students should inform their Academic Supervisor and the Programme Director of any factors that will adversely affect their ability to work on their dissertation topic. Extenuating circumstances will be taken into account by the Board of Examiners, but this information must be available prior to the meeting of the Board. Exceptionally, it is possible for extensions to be granted if justified by illness or other personal problems. This can be done if relevant information is given to the Academic Supervisor or the Programme Director.

Dissertation format

Dissertations should consist of the following:

- Title page with your NAME, EXAM NUMBER, PROGRAMME TITLE, DISSERTATION TITLE and YEAR
- Abstract
- Acknowledgements
- Own work declaration (signed and dated)
- Table of contents
- Main text (including introductory chapter and final chapter on conclusions and/or recommendations)
- Appendices (optional)
- Bibliography

The main text of the dissertation must not exceed 35 pages, based upon a 12-point font size and 1.0-line spacing. The main text referred to here, does not include such things as tables, graphs, figures, appendices and computer code. You are strongly advised to use LaTeX for typesetting your dissertation.

Dissertations must be type set on white A4 paper only. The document may be either single- or double-sided. The following minimum margins must be observed.

Left 30mm Right 15mm Top 15mm Bottom 20mm

The pages in the main text, appendices and bibliography must be numbered consecutively.