

# MSc Project Guidelines

These guidelines are not intended to override any official QMUL regulations, which will still apply. This document provides guidance for dissertation projects for the following MSc programmes:

- MSc Data Analytics
- MSc Financial Mathematics
- MSc Mathematics

## 1. Project

- 1.1 An MSc project is an extended piece of independent study and written work. In these guidelines, we will use the term 'project' to describe all of the work that you will do for this module, and the term 'dissertation' to refer specifically to the written document that you will submit, and on which you will be assessed.
- 1.2 The project will involve an in-depth study of a particular advanced topic in the field of your MSc programme. It will be based around research papers, advanced textbooks and other resources. Your project may involve, for example, explaining some existing advanced results, deriving new results, implementing a mathematical model numerically to investigate the behaviour or accuracy of that model, implementing an advanced algorithm and either studying the theoretical complexity of that algorithm or applying the algorithm implementation to explore problems relevant to your programme of study.
- 1.3 Your supervisor will describe an outline of the structure of your project, and suggest some books, papers and other resources you should consult.
- 1.4 However, it is expected that you will be proactive in finding further references and resources, and in coming up with your own ideas for further investigations, examples and results. Credit will be given for this. Of course, you should discuss any such ideas with your supervisor.
- 1.5 The main work on your project runs from the completion of your exams (beginning of June 2024) until the dissertation submission date, usually in the first week of September, a period of around three months. You are expected to work full-time on your project during this period. If you undertake other activities during the summer (e.g. part-time employment), then you may find it difficult to produce a dissertation at the required level before the submission deadline.

- 1.6 The project is not a 'joint effort' between you and your supervisor. It is entirely your own responsibility to undertake the necessary work and to produce the required dissertation in a timely fashion. Although your supervisor will give you help and encouragement, it is not the job of the supervisor to give you specific instructions every week. It is up to you to decide exactly what work you will do, how you will do it, and when. See the next section on supervisions for more details.
- 1.7 You should aim to 'take ownership' of your project within the first three or four weeks after the examination period (i.e. you should have a clear idea of what is to be done, and how you plan to do it). After this time, the role of the supervisor will become more like that of a consultant.
- 1.8 The project should be entirely your own work and the supervisor may ask questions to check this, especially during the writing-up stage. Help from others (except very general help) is not allowed, and will constitute cheating. This also includes help with writing the dissertation, proof-reading, etc.; see the discussion of **plagiarism** in Section 3 below, and if any doubt please discuss with your supervisor or programme director.
- 1.9 A viva/presentation element will not normally form part of the project or its assessment.

## 2. Supervisions

- 2.1 You should have a meeting with your supervisor as soon as you have been provided a dissertation topic. In this meeting you should discuss the general scope of the project, relevant reading, and any preparatory work to cover in semester B. In early June, after your exams, you should aim to prepare a provisional project plan, including target dates for the various sub-tasks that have to be undertaken.
- 2.2 From then onwards, supervisions will take place by arrangement with the supervisor. Supervision meetings are generally more regular at the start of the project. By mid-July you should be able to work largely independently on your project, and should be aware that supervisors will often be away attending conferences during the summer and taking their annual leave. You are advised to discuss your supervisor's availability early in the project and agree an advance schedule of meetings.
- 2.3 If you are unable to attend a pre-agreed supervision, then please email your supervisor at least 24 hours in advance (unless you are very unwell, or there is some emergency). Likewise, if your supervisor needs to cancel a supervision, then they should give you at least 24 hours' notice by email (unless they are very unwell, or there is some emergency). Thus, please check your college email before leaving home in the morning, if you are planning to travel to Queen Mary specially for a supervision.
- 2.4 Note that supervisions are not the same as private tutorials. It is not the job of the supervisor to teach you the material, but, rather, to give general guidance, and to point you in the right direction (e.g. by recommending resources). Generally speaking, it will be you who 'drives' the supervisions, and not your supervisor. Please come prepared to each supervision with some idea of what you want to discuss in that supervision. Of course, if you encounter particular difficulties, then your supervisor can give you more specific help if necessary.

- 2.5 You should submit a draft of your dissertation (including any associated source code) to your supervisor significantly before the final deadline. Your supervisor will give some general feedback on this, and will highlight any obvious and major errors, but cannot proof-read it or give more detailed comments and corrections. The correctness of your project is your responsibility.

### 3. Dissertation

- 3.1 The dissertation should contain a detailed exposition of the work that you have undertaken. As well as describing your specific mathematical investigations (including definitions, methodology, theorems, proofs, examples, and any new results or computational investigations), you should also include a more general review of the literature that puts your work into context, along with sections such as 'Introduction' and 'Conclusions'. Included in your 'Introduction' section should be a clear summary of what you have achieved in the project work presented, such as any new results, generalisations, corollaries, examples, new connections, or computer investigations.
- 3.2 You should aim to write your dissertation such that it can be understood by one of your fellow students on your MSc programme who is not an expert in the particular area of your project. This means that you should explain carefully the details of any background mathematics or methods that you use.
- 3.3 However, it is not necessary to devote many pages of your dissertation to explaining in detail any basic undergraduate mathematics that you use. (Any such basic material should be explained in a few paragraphs, at most, perhaps followed by a reference to a standard textbook.)
- 3.4 There are not strict rules concerning the length of a dissertation, as this will depend on your topic and approach. The following comments are intended to give you some guidance:
- Your dissertation should contain a **title page**, giving the following information only: Title of project, student name, student number, the dissertation module code and year, supervisor's name and school.
  - A separate page should contain an **abstract** of between 100 and 300 words, summarising the key points of your dissertation.
  - Another separate page should contain a **signed declaration** that the work is entirely your own, and that all sources have been fully acknowledged. You should be aware of the serious nature of plagiarism (as defined in 3.5 below) and the severe penalties which can result.
  - Optionally, you may include a page for **acknowledgements** and/or a **dedication**, although this will not be marked, and will not contribute to the page count.
  - You may include a **table of contents** if you wish. Alternatively your 'Introduction' section could explain the structure of the document.
  - Do not worry too much about the **word count** for the dissertation, since the number of words is not a good measure of how substantial a mathematics dissertation is.

- The **body** of your dissertation should contain approximately 30 to 40 pages of text and formulas. This excludes the title page, abstract page and declaration page, along with any tables, charts and diagrams in the body of your dissertation. Table of contents, appendices and bibliography are also excluded from this page count.
- You should include a detailed **bibliography** (list of references), giving full details of all the books, papers and other resources cited elsewhere in your dissertation. Various referencing styles are in popular use. I suggest you choose a style used in a respectable mathematics journal, such as the Journal of the London Mathematical Society. Remember that (i) you must be entirely consistent, and (ii) each reference must be complete, allowing the resource to be easily and unambiguously identified. Also remember that a reference should be cited in the text of your project at every place it is made use of. (Helpful guidance on referencing is available via the 'Cite Them Right Online' resources: <http://qmplus.qmul.ac.uk/course/view.php?id=7672>.)
- **Appendices**, if present, should contain material that supports the main body of the text, but which does not have to be read in detail. Any appendices will, however, be marked.
- The **total page count** should not exceed 60 pages.
- Please **number** all the pages of your dissertation.
- You should use 1.5 or double **line spacing**, and a **font size** of 12 point. Do not use a fancy **font style**.
- There is substantial credit given for a professional **presentation**.
  - You are strongly advised to use  $\text{\LaTeX}$  and not Microsoft Word.
  - $\text{\LaTeX}$  is not a WYSIWYG (What you see is what you get) editor and so takes some time to master. There are plenty of YouTube tutorials on the topic (see for example <https://www.youtube.com/watch?v=SoDv0qhyysQ>)
  - Some  $\text{\LaTeX}$  implementations produce PDF files that are incompatible with QMUL systems. Under Windows you are advised to use  $\text{\TeX}$ Maker (available here <http://www.xmlmath.net/texmaker/> also for Linux and MacOSX) and  $\text{\MiKTeX}$  (<https://miktex.org/>). Note that you have to first install  $\text{\MiKTeX}$  and then  $\text{\TeX}$ Maker.
  - You will be provided with a QMUL SMS MSc Dissertation  $\text{\LaTeX}$  template. You are strongly encouraged to use this.
- If your project has involved the development of programs you should document this in your dissertation.
  - The source code need not be included verbatim in your dissertation if such programs are essentially a 'means to an end'. (Your dissertation should still, of course, describe what your programs do, and the mathematics/algorithms involved. You might consider including pseudo-code, if appropriate.)

- On the other hand, if you have developed, say, a particularly novel or fast algorithm that, in itself, constitutes a major achievement (and for which you want specific credit), then the relevant code should be included verbatim in the dissertation (probably as an appendix). Any such code will be expected to meet high programming standards, including proper commenting.

3.5 In your dissertation you should make it completely clear which results are your own, and which are someone else's. Any results mentioned in your dissertation that are not your own should be properly referenced. Otherwise you would be guilty of **plagiarism** as explained in the QMUL Academic Regulations:

“QMUL defines plagiarism as presenting someone else's work as one's own irrespective of intention. Close paraphrasing; copying from the work of another person, including another student; using the ideas of another person without proper acknowledgement; and repeating work that you have previously submitted – at QMUL or at another institution – without properly referencing yourself (known as 'self plagiarism') shall also constitute plagiarism.”

Note that suspected plagiarism attempts will be referred to the QMUL Appeals, Complaints and Conduct Office which can impose extremely severe penalties on your MSc (see Paragraph 33 of the QMUL Academic Misconduct Policy 2023–24).

3.6 You should also acknowledge (in your dissertation) any books, journal papers, lecture notes, research notes, other people's MSc/PhD theses, websites, third-party computer programs, etc. that you access/use during the course of your project, even if you do not directly incorporate material from these into your dissertation.

## 4. Submission

- 4.1 The strict deadline will be communicated to you by the SMS professional services team. As an indication, you should expect it to be in the first full week of September. If you believe you have extenuating circumstances preventing you meeting the deadline, you should follow the official procedures.
- 4.2 Late submissions will be penalised as follows: for each day that the submission is late, 5 marks will be taken off the 100 marks available for the project; any submission made later than seven calendar days (168 hours or more late) will be given an automatic zero mark (see paragraph 3.48 of the QMUL Academic Regulations 2023–24).
- 4.3 Precise details about the submission procedure will be published by your programme director or the SMS professional services team nearer the time. You will be required to submit a PDF version of your dissertation via QMplus and plagiarism-detection software will automatically be used.

## 5. Assessment

- 5.1 Your dissertation will be marked by your supervisor and at least one other member of Queen Mary academic staff, who will agree an overall mark for your project. The dissertations will also be scrutinised by the Subject Examination Board (including the External Examiners) for consistency of marking.
- 5.2 The comments in Table 1 below are intended to give you a indication of how much weight will be assigned to various aspects of your dissertation. However, you will not be provided with any breakdown of your final mark.
- 5.3 A mark of 0–49 is a failing mark, given to an unsatisfactory dissertation having serious flaws in its content or presentation. A mark in the range 50–59 is given to an acceptable dissertation, which may still have some flaws in its content or presentation. A mark of 60–69 is for a basically good overall, but not excellent, dissertation. In this range, a mark of 65 or more is only given for a well-presented, sufficiently advanced and correct project dissertation. A mark of 70 or higher is for an excellent dissertation, with advanced correct content, very well explained and presented.

<b>Approx. weight</b>	<b>Description</b>
10%	Abstract, introduction, statement of goals of project and motivation, background and literature review (breadth and depth), and referencing (accuracy, adherence to citation conventions).
50%	Quality of the project work itself (as described in the dissertation), taking into account its difficulty. This includes research methodology, the discovery and choice of resources, the application of these resources, explanation/exposition and correctness of mathematical proofs, any computer programming, if applicable, analysis of results, and form of added value to the topic being studied, such as new explanations, examples, insights, generalisations, or corollaries.
10%	Conclusions, description of your work in context, self-critical analysis, recommendations for future work, etc.
20%	Quality of presentation: Logical structure of document, clarity and coherence of exposition, correct use of English (punctuation, spelling and grammar) and precise mathematical writing, layout and style, sensible use of sections and subsections, lack of typing mistakes, choice of sensible (and standard) notation and other conventions, sensible use of equation numbering, appropriate use of tables, charts, diagrams, etc.
10%	Independence, initiative and ambition (as described in the dissertation): How far did you go, or attempt to go, beyond the project description that your supervisor originally gave you? Did you prove new mathematical results or make new discoveries?

Table 1: Indicative marking scheme