MSc Projects in the School of Mathematics

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1. Background

The School of Mathematics runs MSc programmes in the areas of Statistics and Data Science, Financial Mathematics, Operational Research and Computational Applied Mathematics. A full list of programmes can be found here. A major part of each of these programmes is a dissertation based on students working full-time on a research project for between 10 and 12 weeks, commencing late May or early June.

We are enthusiastic to offer our students the opportunity to work on their project with external partners. This gives companies access to talented MSc students and, because each project is under the joint supervision with a member of our School, this can provide a simple mechanism for organisations to start interacting with academia on research issues. There is no financial commitment to your organisation; all we ask for is some of your time to help specify the project and provide regular feedback, and access to relevant data. The work and results can be confidential if required.

If desired, external organisations proposing and supervising an MSc project with us can interview or otherwise screen students prior to accepting a specific student. Additionally, external organisations can request a report and/or presentation from the student on the outcomes of the project.

We explain below the timetable of these summer projects, the expectations around supervision and our general assessment criteria. We have an online system for submission of project ideas using a simple form. If you would like to discuss any details, please contact us through Rosie Wilkie, Business Development Executive at rosie.wilkie@ed.ac.uk or Business.Development@maths.ed.ac.uk.

2. Typical projects

Operational Research dissertation projects typically give students the opportunity to apply skills developed earlier in the programme (e.g. on solving linear, non-linear and discrete optimisation problems, doing simulations and programming) to challenging practical problems. Projects usually involve reviewing the literature, applying existing or developing new mathematical models and solution methods, and designing and carrying out a computational analysis.

Statistics dissertation projects typically give students the opportunity to apply skills developed earlier in the programme (e.g. classical and Bayesian methods for statistical inference, parametric and non-parametric regression methods, computational statistics/programming) to real statistical research problems. Projects usually involve modelling of the problem and applying existing packages, or using programming to develop statistical methods and test them in novel applications.

Financial Mathematics dissertation projects allow students to make use of the knowledge and skills developed on the programme (e.g. stochastic analysis, Monte Carlo methods, statistics and optimisation, construction of algorithms and relevant programming skills) by working on a real mathematical finance problem within an organisation, although students may also work remotely. Projects often require the design and implementation of computational analysis to a specific area, and can involve a literature review, the application and implementation of existing mathematical models, or development of new approaches to solution methods.

Further information and example project descriptions can be found on our webpages.

https://www.maths.ed.ac.uk/school-of-mathematics/knowledge-exchange/msc-student-projects

3. Operation and practicalities

3.1 Project allocation process

Project proposals are reviewed by academics and confirmed as suitable for one or more of our MSc Programmes. Project topics are then allocated to students.

3.1.1 General Allocation Pool
Normally all projects, academic and industry, are communicated to our students at the same time and they are asked to make a ranked preference. Academic supervisors are also asked for their preferences to act as internal supervisor for external projects. All of these preferences are then optimised to give as many students as highly ranked a project as possible.

3.1.2 Interview Selection
It is possible to select a student through an application and interview process. This must be made clear at the point of proposing the project to allow enough time. We can provide basic support for this but organisations need to arrange and undertake interview themselves.

3.2 Marking process
We would really appreciate if you can also mark the final report. If this is not going to be possible please tell as at the earliest opportunity. You will be provided with a marking scheme and access to our online marking tool. If marks vary significantly between the internal and external markers, discussion is required to reconcile the decision.

3.3 People involved in the project

Please find a list of responsibilities of each key role in Section 5.

Student: A post-graduate student on one of our taught MSc programmes

Organisation: A non-academic organisation who has posed a relevant problem and provided access to tools and data as required for the student to research and write a dissertation.

External supervisor: An employee of an external organisation who has the capacity and business knowledge to support the student through the 12 weeks of dissertation.

Internal Supervisor: All projects with an industry partner will also be allocated an internal academic supervisor from UoE.

Project co-ordinators: Faculty members of the school who have been given specific responsibility within their programme to organise the MSc project process including allocations and co-ordination between other academics.

BDE and Professional Services: Business Development Executive staff and occasionally other members of the school will support communications between industry partners and the school.

Other: As required you may also work with our legal teams on confidentiality agreements although the BDE should co-ordinate this activity.

3.4 Confidentiality and non-disclosure

We understand that data, knowledge and outcomes of the MSc projects can be commercially sensitive or are otherwise required to be kept confidential. We have drafted a general confidentiality letter which can be found in *Appendix 1: Standard Confidentiality letter*. If this is not sufficient for your project please inform us as early as possible to allow our legal team to give advice on a separate agreement.

4. Timetable

The indicative timetable the School of Mathematics works to is below:

- **20 Jan – 10 March:** BDE and academics available for guidance on projects and topics
- **11 March**: Final deadline for project proposals to be submitted.

For projects for the general allocation pool:

- o **End-March**: All project opportunities promoted to MSc students.
- o **Early April**: Deadline for receipt of student expressions of interest.
- o **Mid-April**: Students are matched to projects based on ranking.

For projects requiring interview selection:

- o **w/c 14th March**: Project opportunities promoted to MSc students and applications received by company.
- o **21st March – 1st April**: Interviews to be conducted by company.
- o **7th April**: Final student selection communicated with UoE project team.
- **Early June**: University Exam Board confirms the student's eligibility to proceed to MSc project.
- **End-May/early June** Meeting of student, supervisor and company. This is when the project commences, and a project plan and timetable is agreed upon.
- **End-August**: Dissertations are submitted according to University deadlines.
- **Mid-September**: Marking is completed
- **October:** Feedback on project sought from student and from external supervisors.

5. Responsibilities

The Student, the External (Organisation) Supervisor and the Internal (School of Mathematics) Supervisor each have explicit responsibilities in order to ensure the success of a project.

Responsibilities of the Student

- To deliver the project in the format determined either by the programme requirements or as agreed after discussion between relevant parties.
- To establish appropriate supervision arrangements with the External and Internal Supervisors, typically at least for once every 2 to 3 weeks with more frequent meetings at beginning of the project.
- To be responsible, in conjunction with the Organisation, for appropriate sourcing and referencing of data, and handling commercially sensitive or confidential data in accordance with any required standard imposed by the Organisation.
- To act in a professional manner and be respectful of the culture and working practices of the Organisation, whilst representing the University.
- To attend the Organisation's premises and other locations, as required, to ensure delivery is on track with the Organisation's expectations.
- To be compliant with all legal workplace standards as advised by the Organisation relating to quality assurance, environmental standards, health & safety, etc.
- To be aware of any issues relating to confidentiality, data protection, and intellectual property rights. If working with personal data to become familiar with the Organisation's GDPR procedures and privacy notices
- To make the Organisation aware of any special requirements (e.g. relating to medical or additional support needs).
- To provide feedback at the end of the project, explaining what worked well and any aspects of the collaboration that could be improved.
- To contact the University Supervisor immediately, if there is a problem, complaint or grievance.

Responsibilities of the Organisation

- To provide an External Supervisor to act as the main point of contact for the student.
- To provide an agreed level of guidance during the project period. This can vary from a small amount of time at key stages of the project, to regular ongoing contact, or hosting a student in the workplace.
- To manage, together with the Internal Supervisor, the Student's delivery to ensure they achieve their intended outputs from the project as agreed in the initial project plan.
- To indicate which (if any) data sources and information provided are confidential and should not be released with the final report. It is better to do this early in the project to allow the Student time to amend the project output accordingly. Confidential data provided by the company should be marked as such when provided to the Student.
- To provide the student with GDPR procedures and privacy notices
- To ensure that the self-contained Student output is suitable to be examined for the purpose of awarding a degree, including access to the output by necessary staff (including internal and external examiners, nominated administrative staff). Access to the report will be required by examiners and nominated administrative staff whether or not a project is deemed confidential, and any confidentiality agreement should include this.
- Ensure that the Student is made aware of and complies with workplace regulations relating to quality environmental standards, health & safety, etc. If Student is based in the workplace, the Organisation needs to complete and return the attached Health and Safety checklist (see *Appendix 2: Health and Safety*) prior to the project start date. Standard visitor policy for the Organisation to be applied for all other workplace visits.
- To engage with the Internal Supervisor to provide feedback, which may or may not form part of the Student's final assessment, as agreed at the outset.
- To contact the University Supervisor immediately, if there is a problem, complaint or grievance.

- To provide feedback at the end of the project, explaining what worked well and any aspects of the collaboration that could be improved.
- To provide appropriate liability and insurance cover, if necessary[1].

Responsibilities of the Internal Supervisor

- To review the project scope with the Organisation in advance to ensure it meets academic requirements and learning outcomes.
- To engage with the Student during the project to offer appropriate guidance and to visit the Organisation, as is appropriate.
- To give advice to the Student on the subject area, relevant literature, presentation format, methodology, and structure of the dissertation and
- To manage, together with the External Supervisor, the Student's delivery to ensure they achieve their intended outputs from the project as agreed in the initial project plan. The Student may ask the Internal Supervisor to read a draft of part of the dissertation, but it is up to the Internal Supervisor's professional judgement as to how much of the dissertation he or she is willing to read.
- To engage with the Organisation in the case of concerns, where issues have been brought to attention by the Student or Organisation.
- To arrange back-up facilities for prolonged periods - two weeks or more – when the Supervisor is unavailable.

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[1] In most cases, students will be covered automatically by employers liability insurance
https://www.abi.org.uk/globalassets/sitecore/files/documents/publications/public/migrated/liability/abi-guide-to-insurance-and-work-experience.pdf

Appendix 1: Standard Confidentiality letter

CDA (SoM MSc dissertation project) 2022.pdf

Appendix 2: Health and Safety

The Organisation shall comply with all health and safety laws, rules and guidelines and shall be responsible for the health and safety of the Student whilst on its premises or elsewhere in connection with the Organisation's business activities.

It is recognised that the Student will not be familiar with the Organisation's premises and the Organisation will adapt its procedures and supervision accordingly.

Where required, the Organisation will carry out a risk assessment, provide training and protective clothing and equipment, make the Student fully aware of any special hazards or dangers and immediately report any accidents involving the Student to the University.

The Student is required to: take reasonable care to avoid injury to themselves and to others; not interfere with or misuse any clothing or equipment provided to protect their Health and Safety; and to report any accident or injury immediately following the Organisation's procedures.

	Pre-placement Health and Safety Checklist to be completed by the Organisation if the Student will spend time on-site or conducting fieldwork in relation to the WBP	YES	NO
1	Do you have a written Health and Safety policy?		
2	Do you have a policy regarding health and safety training? Will you provide all necessary health and safety training for the Student?		
3	Is the Organisation registered with Health and Safety Executive or the Local Authority Environmental Health Department?		
4	**Insurance**		
	Is Employer and Public Liability Insurance held?		
	Amount of Indemnity held in £ (for example £5 million)	£	
5	**Risk Assessment**		
	Do you carry out risk assessments of your work practices?		
	Are the results of risk assessment implemented?		
6	**Accidents and Incidents**		
	Is there a formal procedure for reporting and recording accidents and incidents?		
	Have you procedures to be followed in the event of serious and imminent danger to people at work?		
	Will you report to the University *all* recorded accidents involving students?		
	Will you report to the University any sickness involving students which may be attributable to their work?		

The Organisation's nominated contact for compliance with the requirements of health and safety legislation is:

Name:		**Position:**	
Email:		**Telephone:**	

FAQs

- **Do I need to pay the student?**
  We do not expect you to pay for the student's time as this is not an internship. Rather it is a key part of our MSc programme and the primary aim is for students to develop a structured dissertation report which can be used to gain their masters qualification.

  However, if you expect the student to travel to your office and this is outside the City of Edinburgh then we would ask that you pay reasonable expenses towards this.

- **How much of my time do I need to spend supervising the student?**
  We suggest that you meet the student for around an hour once a week to specifically discuss the project. If the student is physically within your team of course the contact may be significantly more than this. We would encourage you to invite the student to any relevant team or company meetings for them to get a better sense of the organisation and how you work.

  We appreciate that the projects run in a period when many people are on annual leave at various points. We would ask if you can let the student know when you will be unavailable and whether there is another appropriate contact.

- **What happens if I am concerned that my student is not engaged, becomes unwell or otherwise cannot complete the project to the expectations set at the start?**
  Please contact the academic supervisor as soon as possible if you have concerns about the student. The University can provide a variety of support.

  If it has become apparent early in the project that the student does not appear to have the expected skills and knowledge for the project, again please raise this with the academic supervisor as early as possible so that they can consider whether something else is suitable.

- **What happens if I leave the company part way through the project or am otherwise unable to continue with supervision?**
  Again please contact the academic supervisor or Business Development Executive as soon as you can in this circumstance. Depending on how well progressed the project is it may be possible to continue the project topic with the academic supervisor. It would also be possible to consider a different supervisor in your organisation if there was someone willing and able to do so.

- **What outputs can I expect to see from the student?**
  You will receive a final copy of the written dissertation report. If you would also like a copy of any code written as part of the project that has been created outside your own infrastructure please make this clear to the student as early as possible.

  It's important to understand that the dissertation project is not contract research and is not intended to produce specific research results but is considered as a part of the student's MSc research and training programme. Whilst of course we hope that the outcome is useful for your organisation there is no guarantee that the results shall be error free, or fit for any specific purpose.