Postgraduate MSc Project Guidelines

University of Bristol

Department of Computer Science

December 8, 2010

These Postgraduate MSc Project Guidelines detail the entire MSc project process from motivation through to final submission; inclusive of conduct, supervision, milestones and assessment. Unless explicitly stated the following applies to ALL MSc projects in the Department regardless of the degree title or theme. This document will be revised and updated annually. Upon publication these guidelines should be **strictly** referenced and adhered to for the academic year to which they relate.

In part this document is inspired by guidelines produced by Keith Martin for RHUL, the BCS Guidelines on Course Accreditation (Postgraduate Project Requirements) and the QAA Higher Education Master's Degree Characteristics document published in September 2009.

Prior to 2010 the Research Skills unit detailed in Chapter 3 of these guidelines was titled the Project Specification and Design unit. During this transition year some legacy documentation and School timetables may still refer to the previous title for this unit but they should be considered synonymous.

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Chapter 1

Introduction

1.1 Why do you do an individual project?

In the BCS Guidelines for course accreditation it states that postgraduate projects should reflect the ethos of advanced study and scholarship appropriate to a masters degree (whether generalist or specialist). Projects are designed to give you an opportunity to demonstrate:

- a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of the specialist academic discipline
- a comprehensive understanding of techniques applicable to their own research or advanced scholarship
- originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline
- deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences
- demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level
- critical self-evaluation of the process

These core requirements are structured to provide you with exactly the skills that future employers expect of people with an MSc. This is true regardless of whether you go on to work for a computing-related employer, in other sectors of industry or commerce or if you continue in academia toward a PhD.

We want our students to go out and impress future employers. When in an interview we want you to be able to not only discuss your thesis but to confidently explain *why* the work has value and to answer questions that challenge the relevance of your work in a wider context. This is what employers tell us they find so attractive about Bristol graduates; the fact that they can answer

such questions with passion and confidence. We have therefore designed our MSc project process to enable you to gain the necessary experience, knowledge and confidence to excel beyond your MSc.

For many writing an MSc thesis will be the most challenging experience they have at university. To make the process as simple as possible we divide writing your thesis into two distinct stages.

- **Research Skills** 20CP:
  The Research Skills unit (currently called the Project Specification and Design unit) results in a *Research Review*.

  In this unit you will write a mini-thesis as practice, and get constructive feedback on this. You will also do a lot of the necessary research and literature review in preparation for your final thesis. We will give you guidance in how to research, structure and write your thesis. This Research Skills stage represents about a quarter of the time you will spend on your thesis.

- **Individual Project** 60CP:
  Your Individual Project will result in the submission of an MSc thesis. Although you can start your project at any time toward the latter part of the programme, you will usually begin as soon as your summer exams finish and work on your project *full time* until the end of September.

The final mark for your Individual Project is derived mainly from marking your thesis, independently of whether your project involves significant software or hardware development. This is for several reasons:

- It tests your ability to document and disseminate ideas, motivate your project and meet all the objectives set out for you.
- This treats all students – regardless of project type – on an equal basis.
- It is your thesis which will represent your work on leaving the University. Employers will not see your code or implementation details but they may want to read your thesis.

However, this does not mean that your thesis should not discuss any implementation details or that we will not take into consideration any software or hardware developed for the project. More importantly you should discuss the design process behind any implementation. What it does mean is that we will be marking the thought process behind any software or hardware that you build and what that system enables you to do.

1.2 What is expected of you?

Here is an ABC check list of the type of things we will be assessing. You are expected to have demonstrated an ability to perform the following core skills:

A) To work independently on a Computer Science related project for which you have defined the objectives and rationale

In other words you are being asked to

- **Work autonomously**. Your work will be self-motivated, with an individual deliverable. This does not mean you cannot talk to other people about your project (indeed we encourage you to discuss your work with as many people as possible) or read and absorb other people's ideas about your topic (indeed you must do this). What it means is that the reports must be based on your own work, be written in your own words, and present your own ideas about your chosen topic.

- **Work on a project related to your chosen MSc speciality**. Advanced students will receive an MSc in a specific subject, therefore you should expect, and future employers will expect, that the subject of your MSc project is related to your degree title or theme.

  Given the nature of the MSc in Computer Science, MS50 projects will be expected to contain a substantial programming component and demonstrate complex software development.

  Of course, your work may be influenced by or reference other areas of Computer Science (or indeed other academic areas such as the physical or biological sciences, as a non-exhaustive list of examples).

- **Have defined objectives and rationale**.

  A project must be a well defined unit of work. You must define what the goals of your project are, and what it achieves. More importantly you need to explain why these goals and achievements are worthy and important. In other words it is not just enough to explain **what** you have done, you also need to describe **why**.

B) Apply knowledge about an area to a specific problem, which may be engineering, analytical, academic or applied in nature

You are being asked to absorb information (from course materials, resources, experiences and the literature) and then **do something with it** by applying it to a particular research problem. In other words you are being asked to **add value** to the prior information you have gleaned. There are many ways you can add value:

- By conducting experiments which have not been done before.

- Implementing something which has not been done before.

- Designing a novel architecture to solve a problem.
- Applying theory to a practical environment.
- Developing new theory.
- Analytically comparing different approaches to solving a problem.
- Conducting a detailed critique of a particular technique or technology.
- Assessing standardization work.
- Producing a comprehensive overview of a new area for which no such literature exists.

The above list is not intended to be exhaustive — good projects add value in many different ways. But your thesis should demonstrate clearly in which way you have added value to existing work in the area.

C) Produce a well-structured report, including introduction, motivation, analysis, and appropriate references to existing work

We are not marking how many hours you put in, or how much stress you put yourself under, in the long run all we mark (and all any future employer will see) is your thesis. The final mark will be a combination of both the content of your thesis, and your ability to write a thesis.

You will be given guidance and training in writing a thesis, and indeed one quarter of the way through the project you will write a mini-thesis as a Research Review and receive feedback. This should be considered a practice-run for the final thesis. Your thesis must exhibit the following traits:

- **Be well structured** – it needs to be organized in a logical way.
- **Be driven by a clear and defined motivation**
- **Contain analysis**. Whatever you do you must include a critical analysis of the subject. You should demonstrate how the topics in the report relate to one another.
- **Adopt appropriate techniques and technology**. Whatever you do must be done with the most appropriate methodology. Applying numerical experiments in an area where theoretical models are more appropriate may reduce your marks, and vice-versa.
- **Contain relevant references to existing works**. You must demonstrate that you understand how your project fits into the wider context of the subject area.
- **Be creative** – we adopt Sir Ken Robinson's definition of creativity:

  "The process of having original ideas that have value."

1.3 Administration

We end this introduction with a general note: If you are in any way confused by this document, or confused by any aspect of what is required of your project then you should first consult your Project Supervisor. If this turns out to be unfruitful, or you do not yet have a project supervisor, then you should consult the Unit Director for your MSc Project (either Erik Reinhard or Majid Mirmehdi). Minor administrative issues can be addressed to the Graduate School Office. This year Nyoaka Squire is the Postgraduate Programmes Coordinator. If you are still confused you should contact Neill Campbell - the Head of Department.

Chapter 2

Project selection

As already said, the project consists of two units: Research Skills and the MSc Individual Project. The first is a 20 Credit Point (CP) unit and the second is a 60CP unit. This means the first part corresponds to $\sim$ 200 hours of work, whilst the second corresponds to $\sim$ 600 hours of work. Throughout the entire project you will work closely with an academic supervisor. Step one is to select a project and a relevant supervisor.

2.1 The selection process

1. During the Autumn Term **all academic staff** will formulate a list of projects. In order to offer as wide a range of projects as possible each member of staff should create between four and eight proposals. Where a project is proposed by an RA – the RA will be the named project supervisor (with an academic member of staff acting as mentor for the supervision).

   As well as a title, each project will be clearly defined by a detailed synopsis which defines the nature of the work and includes any prerequisites or supervisor expectations. Project descriptions will clearly indicate the Type of project (2.3) and the relevant School research group to which the work relates. Some staff may decide to propose projects at this stage with the intention of allowing students to adapt them (see point 4 below regarding new project proposals).

   Research groups will meet to preliminary discuss and brainstorm project ideas for the coming session.

   General projects (that are not directly related to a specific research group) will be posted to a separate list of projects for which any staff member could be a possible supervisor.

2. At the start of the Spring term the relevant research groups will pre-approve the list of projects that have been created by staff. Once approved these will be made available online for all MSc students to access.

3. You will have *Weeks 12 and 13* to select a project by talking to staff who are offering the projects that you find of interest. You will usually

take an existing project offered by a member of staff, but it may be that in talking to a member of staff you design a new project proposal of your own. Where a **completely new** project is being proposed it must be supported by an academic member of staff and be submitted online before the end of *Week 13* in the same format as the staff proposals – the relevant panels will review and approve any new projects at the end of *Week 13*. Minor changes do not need to be re-approved as these are deviations, which as the next paragraph explains are to be expected in the normal course of a project. We expect at most ten percent of projects to be student designed, whereas ninety percent will be from the list provided by staff.

4. We expect students to deviate from their original project idea as the project progresses, indeed if you could plan a project in perfect detail at the outset there would be little need to do the project at all. However, a significant deviation from your original proposal needs to be justified and discussed with your supervisor.

5. By *Week 14* you will have selected your project and started to discuss ideas with your new supervisor who will have to officially accept you. Note, it is NOT possible for you to select a project without agreement from an academic member of staff - the project supervisor.

   Clearly, supervision is a two-way process. You cannot simply select a project from the list – you must be accepted by and talk to the supervisor proposing the project. You cannot select the same project as another student. Similar ideas must be clearly differentiated in separate project proposals. The online registration system will require the supervisor to actively agree to your being supervised by them.

6. Ultimately, it is the marking panels' responsibility to decide project suitability and allocation.

7. The panel have a responsibility to ensure that you are **all** provided with the same opportunity for supervision and staff contact during your project. Where the number of students accepted by individual lecturers results in a significant imbalance that could affect the quality of supervision the panel will seek to reallocate projects with minimal disruption.

8. A staff panel meeting will be held in Week 13 to discuss project selection, including the distribution of projects amongst supervisors and research groups.

2.2 Advice on project selection

Staff will present projects not just in their own research area but also in proportion to the numbers of students on each of the MSc programmes. Please consider the following when you select a project:

- You should pick a topic which interests **you**. This is by far the best way to ensure you stay motivated throughout the project. Asking yourself which topics you found of most interest in the taught component of the course so far, or in your previous degree, is often a good place to start.

- Where possible you should make best use of your existing knowledge and experience as a starting point. This way you play to your strengths and avoid steep learning curves of grasping new programming languages or technology.
- Beyond an academic qualification, your MSc is designed to provide you with the best opportunity to advance toward your chosen career path. Your target profession, sector or academic institution may play a role in your project selection.
- As a department we have close links with industrial partners and we encourage collaborative projects. For some projects an external supervisor may well play a key role BUT an internal academic must act as the primary supervisor.
- You should select a relevant topic of timely interest. This does not prevent you from re-investigating older concepts, but you should re-target them for utility in contemporary Computer Science.

When thinking of a project you might like to consider the following progressive set of questions:

- Why should **you** do it – rather than someone else? What specific skills or experience do you have that complement the task?
- Why is this topic of interest to the Computer Science community? After all this is an MSc in a Computer Science department.
- How might your project benefit academia beyond Computer Science? Perhaps there is an application of your project that could aid research in another academic subject?
- Is there potential for your project to impact wider society beyond academia?

You need to answer these questions in order – there is no point in doing a project which makes a major contribution to Theoretical Physics, or saves millions of pounds for the Health Service if you are not personally motivated by the idea or it does not involve any Computer Science. This last point is very important. Commercial impact may motivate a project but you are marked on the Computer Science component of your thesis not on projected market impacts.

2.3 Project Types

Projects can be of varied types, which reflect the diverse nature of Computer Science. In essence we consider there are essentially three "types" of project, although any specific project is often a combination of the three basic types.

- **Type I:**
  Software or hardware development. These are projects which build something *new*, utilizing some *concepts* from Computer Science. The key words are *new* and *concepts*; developing something which has already been done, or which is relatively trivial using standard applications will not allow you to get an MSc. The added value in these projects will mainly come from the design and evaluation work needed.

- **Type II:**
  Investigatory. In these projects you are asked to work on some research problem, possibly coming up with new results or new techniques. Usually the research problem is motivated by some real world issue. Sometimes such projects involve practical experimental analysis (via programs), sometimes they are more about designing or investigating a solution (via pen-and-paper). The added value in these projects will come from the analysis work you need to do in both in defining the requirements, developing solutions and evaluating your solution.

- **Type III:**
  Theoretical. These projects are mainly about developing models or theories which explain some concept or idea in Computer Science. Such projects are harder to validate, in the sense of showing success criteria for your work, since theories take many decades to establish and validate. Often such thesis are more mathematical in nature than others. The added value in these types of projects will come from the mathematical, logical, or other, analysis you provide in your thesis, which is over and above that found in the existing literature.

The Research Skills unit will provide lectures to enable you to understand how your own project fits into these basic types. In addition all types of project will require an extensive literature review before you have the knowledge needed to start your thesis. Thus the Research Skills unit will enable you to perform this review, and consequently enable you to achieve more in your summer project.

You can select any type or style of project but we normally expect students on MS50 (the MSc in Computer Science) to do a Type I project. MS50 students who are interested in selecting a Type II or Type III project should discuss this with the Course Director, who this year is Majid Mirmehdi.

2.4 A discussion of project styles

This section (2.4) is provided primarily for staff and as a point of reference for marking panels. Many projects will result in a combination of the three basic types. To provide more background, we give a set of more detailed possible project styles. This set is not exhaustive, and is only to give you an idea of the range of possible project styles and methods.

Note: in all cases you are expected to go beyond the taught components of your course and demonstrate your own original thoughts and contribution.

2.4.1 Empirical Science

Much of Computer Science is about developing new algorithms for problems, or applying existing algorithms in novel situations. As such it very much resembles standard empirical science in that one can test whether Method A is better than Method B, by collecting data and analysing the performance. In Computer Science such projects would normally involve programming, or possibly hardware

development work. Hence such projects are often *Type II* projects, in that they are essentially investigatory in nature, but they involve a component of *Type I* projects, i.e. they usually require a reasonable amount of implementation.
Note: your final thesis is marked on what the thesis contains and not the code. So it is important in such projects that you do not treat the code itself as the end-product, you should consider what the system allows you to do, and how that may be demonstrated and evaluated. Such projects are by far the most common type of project in our department.

2.4.2 Engineering

Many computer systems are inherently complex. Suppose you want to solve a real-world problem, to do so you may need to glue various high level technologies together in a thought experiment. Example projects could be to design a banking payment system for adoption in Africa, where the computing system of choice is a 2G mobile phone (access to conventional PC networks or modern 3G services are limited). Alternatively you may want to compare existing solutions in a particular domain - for example different online banking interfaces. These are all subjective and qualitative comparisons where there may be no correct solution. Such projects we refer to as *Type II* projects, but unlike empirical science style projects they are unlikely to involve significant development work. As such evaluation is a key problem, and should be well thought-out at the planning stage. Engineering a system typically leads to the discovery of challenges that would not have been obvious without actually going through the engineering process. The process, however, is very different from the empirical process in the scientific method: in the scientific method, one must have a clearly identified problem with a potential solution that can be objectively evaluated. In engineering one encounters problems only in the process, and mostly these problems are highly contextual and subjective. Several solutions are optimal depending again on the context (showing that a solution does not work is only partially helpful – typically you want to present a complete solution). As such, Engineering style projects are harder to define as to what constitutes a correct solution, indeed one may not exist. It is often impossible to even produce a prototype for demonstration, as the architecture is too complicated. However, a good thesis will argue why the proposed solution satisfies the requirements of a system.

2.4.3 Theory and Algorithms

There are at least two types of project which fall into this category. In the first you would focus on developing or studying models. These models take the form of definitions or theories which you could investigate for a new area, or an area in which the definitions and existing theories are currently underdeveloped. Those interested in cryptography may, for example, consider the types of definitions for encryption and signature scheme met in your course. Having done this, an in depth analysis of their consequences when applied to algorithms, protocols or systems may be suitable. In such a project you need to argue why the definitions you use make sense and why your theories fit the area you are trying to model. In the second type of project you would work on analysing or developing novel algorithms with better provable performance than is currently

known. This could involve simply presenting an algorithm with a better space or time complexity or alternatively investigating existing algorithms where certain aspects, be they empirical or theoretical, are not yet clear. A well engineered implementation of a state of the art algorithm whose performance in practice is not yet known is also a legitimate project that would straddle several areas of interest within the MSc programme.

2.4.4 Review and Survey

In many areas, especially new research areas, many publications exist with no order. A valid contribution is therefore to bring order to chaos and present a coherent literature review of the area. Such projects often lead to PhD research, or assist future MSc students by forming a basis. As such these are projects of the *Type III* variant, but in areas in which the Computer Science is not yet advanced enough to enable students to make a theoretical contribution of their own. Such projects can be (incorrectly) thought of as simply reading papers and summarising them. However, they are not to be considered a soft option. To excel at such projects you need to fully understand complicated technical literature and then distill this literature down in a way which brings new insight to a problem or area. In some sense these projects are akin to an extended Research Review – but at a much deeper level. Such projects inherently carry a risk – you may be tempted to simply produce a summary as opposed to introducing some new intellectual content, analysis and critical review. On the other hand when done correctly such projects can achieve very high marks and produce thesis of long standing value to the community with high impact. It is not uncommon for such a thesis to be receive a large number of citations when it is placed online; as others around the world make use of the synthesis of a specific topic completed by a student. Producing a summary may involve re-casting existing works into a coherent form, comparing published results, discussing and exploring inconsistencies, spotting trends, and so on.

2.4.5 Computing and Society

A major barrier to technological deployment normally comes from business, societal or human factors. To investigate how technology impacts on society and the marketplace and to develop new understandings is a very complex task. Such projects owe more to techniques in the social sciences than to techniques in the physical sciences, indeed these topics are close to what product and systems analysts may do in companies. These are examples of *Type II* projects. Such projects are often very difficult to complete successfully as they often require access to data, people or skills which are not easily available. Such projects are usually only worth considering if there is a strong industrial partner to provide data and to guide you.

2.4.6 Product Development

Suppose you have an idea for a **new** product or service which involves some **significant** Computer Science component which can differentiate it from competitors, then this would be a valid project. At first sight this just looks like an implementation project, but the real innovation and added value is in the fact

that it is a new product and contains significant Computer Science innovation. These are therefore the main example of a *Type I* project. New products can be designed by combining technologies in new ways, so you don't need to create completely new Computer Science research. You just need to combine things in a novel way. Again, *new* is the key word, but if the elements you combine are sufficiently deep and complex then your mark will also be better (and your product more innovative). Combining a web server and a database is not new, and it combines known standard technologies. You should not think that such a project will allow you to opt out of demonstrating scientific understanding – indeed complex concepts and recent academic publications in the area become more important in this context.

Chapter 3

The Research Skills unit

This unit is designed to introduce the fundamental skills that you will need to embark on your project. In order to identify and understand prior works a key phase in any project is background research. For academic projects this results in the creation of a comprehensive literature review. The reading and background research you conduct during this time will form the basis of your thesis by establishing a project history and placing your work in context to previous research and methodologies. This process, of reading, distillation and writing will help you to formulate and understand the aims and objectives of your project in more depth than the initial project proposal created by your supervisor – **before** you embark on the *real* scientific research in the summer.

The reason you need to choose your project by *Week 13* is that by the end of *Week 23*, ten weeks later, you will need to submit a report which constitutes $\sim$ 200 hours of study. In other words you are expected to devote roughly half of each week to the creation of your Research Review during this period. If you choose your project and supervisor too late in the process it will quickly become impossible to catch up.

The Research Review will contain a comprehensive literature review centered around your project **and** introduce and explain your intended individual project. The material in the report may be re-used as part of your final dissertation, and this should be borne in mind when creating it.

3.1 Guidelines

1. Although the majority of the time allocated for this unit is intended for independent study and for you to liaise with your supervisor you must attend the lectures on researching and report writing. These are usually given as a set of lectures during the Spring term. There will be around 10 lectures covering aspects such as:

    - Types and styles of projects. What makes a good project?
    - How to write.
    - How to use references.
    - How your final thesis should be structured and presented.

- How to avoid plagiarism.
- Evaluation and metrics – how to measure performance

2. Your Research Review must be submitted electronically as a **pdf** document, and TWO soft-bound copies of the dissertation (identical to your electronic submission) must be handed in to room 3.37 MVB on or before the deadline. You will be required to scan your student card as the barcode will register the time and date that you have submitted your hard copies. This is why you cannot rely on friends or others to hand in your dissertation, as hand in date and time will be unique to your student number. If you cannot submit personally, you must contact the Course Director in advance of the deadline and discuss possible alternative arrangements.

3. Your Research Review will be read in detail by at least two staff members, a marking panel will determine your actual mark. Details of how marking panels work are discussed in a separate document.

4. At least one of the academics who reads your Research Review will have some familiarity with your subject area, but they will **not be your supervisor.**

5. One reader is highly likely to come from a different research area, so your report needs to be understandable to a non-specialist – although they will be an academic Computer Scientist.

6. Your Research Review will be marked as to whether it satisfies the following criteria:

   - You should demonstrate that you understand the aims and objectives of your Individual Project.
   - You should show an ability to research and collate information.
   - You should show an ability to digest and critique existing literature.
   - You should clearly explain where or why your Individual Project will add value.
   - You should demonstrate an ability to structure and write a comprehensive scientific report.

7. Markers will take into account the different success criteria implied by the different project types.

3.2 Supervision

You should see your supervisor at regular intervals, at least once per fortnight. Some supervisors meet with all their students at once, some meet with their students on an individual basis. If you cannot find a time to meet your supervisor then please contact the Unit Director. Experience shows that the more a student interacts with their supervisor then the higher the final mark the student obtains. As previously stated supervision is a two way process – your supervisor is not expected to chase you if you regularly miss arranged sessions.

3.3 The Research Review

For some projects with a significant development process, or experiment to perform, the Research Review may consist more of analysis of choices of technologies to be used in the final implementation. For other more theoretical projects the Research Review could consist of a significant research review. But all Research Reviews must provide a thoroughly referenced background literature review, as to how your work sits within the overall subject area.

Typically a Research Review will contain at least a twenty page literature review. Such a literature review must be extensive and of a suitable quality of source material. For example references to Wikipedia are not acceptable source material, since it is just an online encyclopedia, nor are websites; you should be using primary source material such as academic papers and standards documents. With each reference you cite you need to argue in the review as to why it is relevant to your project. Thus a general overview of a subject is not sufficient to obtain high marks, it needs to be focused. The literature review should read as a survey paper, namely it should be a stand alone piece of work which could be given to another student to learn about your specific topic. It is this literature review and the one page summary which will be marked, the appendix mentioned below will **not** be marked but will be used as a basis for the discussion with panel members at the end of June.

- The exact structure and format required for your Research Review will be discussed during the Research Skills unit and style files will be made available online. Your Research Review should start with a one page summary which details the following points:

- Simply – what your final thesis will be about. This should introduce your chosen Individual Project in your own words (NOT a reiteration of the original project proposal).

- In general terms whether your project is more of Type I, II or III.

- What methodology you will adopt, explaining whether the project will involve significant amounts of programming, theoretical discussion, product engineering or experiments.

- How your literature review relates to your topic?

It is also required that the project ends with an appendix, at most four pages, detailing:

- Any significant progress have you made on your Individual Project. Whilst you may not have started any real implementation you might detail design decisions that have resulted from your research such as which technology or programming environment you have selected and why.

- An approximate timeline for your project, broken up into work blocks.

- What the success criteria for your project will be, i.e. what you think would constitute a thesis worthy of a distinction in your chosen area.

The purpose of this appendix is to convince your supervisor and the marking panel that you are ready to proceed to the project.

The Research Skills unit is like any other unit. You should pay the same respect to attendance at lectures, deadlines and plagiarism as you would any other unit. Failure of the Research Review does not necessarily mean that you will fail to progress to the project. If this is your only unit failure you may be eligible for a compensated pass to proceed and you will not need to resubmit the Research Review a second time. If for ANY reason you have to resit other units and fail the Research Skills unit you will not be allowed to proceed to project and WILL have to resubmit a new version of your Research Review by 1st September. Information about resubmissions and your progress on the MSc as a whole will not be available until all exam boards have been completed.

Chapter 4

The Individual Project

4.1 Research Review feedback

1. Feedback for your Research Review, specifically your project summary, will be given at the end of June – the week of the MSc examination boards.

2. You will receive direct feedback on the plans for your thesis outlined in your appendix. This will be via a **short compulsory feedback interview** between you and representatives from the marking panel, not necessarily your markers.

3. You will receive written feedback and rationale for the mark for your Research Review. This feedback will be combined with any additional comments that result from your interview, so that you have a record of what was said. These notes may give you additional suggestions as to how to proceed in the coming months.

4. Your supervisor will obviously have access to the panels' written comments but any concerns regarding your mark that have not been addressed during the interview must be voiced through the Unit Director. Supervisors are not allowed to directly contact your markers or the panel members on your behalf.

5. Once these feedback interviews are complete you proceed to project under the direction of your supervisor.

4.2 Advice to Staff and Students

Styles of supervision will vary but as a guide you are expected to meet your supervisors at least once every fortnight throughout the summer, although staff can be expected to take some time off for a vacation. If staff are away for an extended period they will arrange other supervision for you. If you feel your supervision is inadequately provided then you need to contact the Unit Director or Head of Department at that point – not retrospectively.

Chapter 5

Submission and Final Assessment

5.1 Poster and demonstration event

In September there will be a poster and demonstration event organised for all MSc project students. This is a busy and exciting annual event (in the style of an academic conference poster session) where you will be able view and discuss your work with your peers, academic staff and invited industrial partners. Importantly you will be given the opportunity to discuss your work with your markers and present any results or demonstrate any software or hardware you have developed during your project. The timing of the event is such that you will have a number of weeks to act on any feedback you receive from your markers prior to submission of your final dissertation.

You will meet each of your markers individually at an allocated time and are expected to use your poster to present your project and where appropriate provide a live demonstrate of software or hardware. The session is NOT assessed formally but creating and presenting a poster design is a useful summarisation exercise and an excellent opportunity for your markers to see an overview of the work before assessing the full dissertation. Although you will only be allocated a short time with your markers (15-20 minutes for both the presentation and demonstration) the story you tell, from your original motivation for the work through to your results and conclusions, may well form the structure of your final thesis.

5.2 Poster submission and guidelines

Your poster should be designed as a normal portrait A4 PDF file and submitted to the online submission system well in advance of the event. Your design will be automatically scaled to A1 and printed on the department's A1 printer. You will obviously need to pay attention to the resolution of any photographic images or illustrations you include in the design. Printing a large volume of A1 posters is very time-consuming process - please submit your poster well before

the event. We do not guarantee printing of your poster if it has been submitted late and/or there are problems with your file. There will be no printing on the day of the presentations.

5.3 Thesis submission

The submission process for your Individual Project should be familiar, since it mirrors the Research Skills unit.

1. As for your Research Review, your thesis must be submitted electronically as a **pdf** document, and TWO soft-bound copies of the dissertation (identical to your electronic submission) must be handed in to room 3.37 MVB on or before the deadline.

2. The Department is not able to bind dissertations. Local companies that can bind dissertations include Prontaprint on Park Row (ask for thermal binding) and Kall Kwik on Fairfax Street (ask for fastback binding). The front and back cover pages of your dissertation should be light blue soft card or light blue paper (card is preferable). You can get the blue card or paper from local stationery shops such as Ryman on the Triangle or Stationery World on Park Street.

3. Different to your Research Review your thesis must start with a one page executive summary which details:

   - The aims and objectives of your project.
   - What was the type of project? Is your project a literature review, an experiment, a theoretical investigation or an engineering project.
   - Importantly this summary must detail exactly what has been implemented or completed in addition to what you presented in your Research Review
   - The summary should end with a list of five elements which you are most proud of having accomplished – to excite your markers.

4. As well as your dissertation you should submit all of the source code written for your project, as a single compressed file (.tar.gz or .zip). Do not submit an uncompressed file because these can be garbled by the submission system. The reason for this submission is to enable your project to be assessed properly. If your project is of a more theoretical nature, source code may not need to be submitted; if in doubt ask your supervisor for advice. If there are commercial restrictions that prevent you submitting the source code, please inform your Course Director.

5. The date for submission is a hard deadline - extensions will not be granted. If for some reason you find that you are unable to spend the required time on your project then you must talk to your Course Director as soon as possible. In very exceptional circumstances it may be possible to arrange for you to complete your project within the following year. However, taking on paid employment or any other activity in place of working on your project will not be accepted as a legitimate reason for such deferrals.

5.4 Composition

Your thesis should reflect the ethos of a masters project (as detailed at the beginning of this document) and should demonstrate the following:

- That you have worked independently beyond the taught components in the course.
- That you have chosen (and justified your choice) of an appropriate method of enquiry.
- That you have demonstrated original thought and creativity.
- That you have completed the task you set out to do (as specified in your Research Review appendix); or there is a reasonable justification for your deviation.
- That you have demonstrated an ability to collate information, critique literature and show excellence in report writing.

The literature review you created for your Research Review should equate to only one quarter of the work represented in your final thesis.

5.5 Final Marking Mechanism

Your thesis, as well as your earlier Research Review, is marked using the department's marking panel process. Details of this are provided in our Marking Panel Guidelines Document, but essentially it means that your mark is derived and checked in a highly robust manner.

- At least two members of staff read your thesis in detail.
- Your thesis is discussed at a panel meeting of a sub-set of all the academic staff. At this meeting your mark is determined and placed within a ranked list of all students.
- An external examiner, usually an eminent Professor from another institution, validates the marks.
- These validated marks are then passed to the Departmental and Faculty Exam boards which approve them.

Chapter 6

Failures and Resubmissions

If you fail the Research Skills unit in June this does not preclude you from starting your project – unless you also fail a number of other units which would imply you do not have enough credit points to progress to project.

Failure in your Individual Project in September will mean that you do not qualify to obtain an MSc. In various circumstances resubmissions are allowed, the criteria for this are explained in the degree regulations. In all cases a resubmission is marked under the same criteria as the original submission, although sometimes the pass mark may be different. In addition – in all cases it is a marking panel which determines your mark and not a set of individual markers. In this way your mark is obtained by a consensus of academic opinion on your work.

Appendix A

Timeline

Autumn term	-	Staff formulate and submit project proposals
Autumn term	10	MSc Project Guidelines are introduced to students
Spring term	11	Staff projects are reviewed and approved by research groups
Spring term	12 13	Students meet potential supervisors to discuss projects. Staff to confirm supervision
Spring term	13	Research Skills unit lectures commence
Spring term	13	Any new projects that result from discussions with staff are submitted
Spring term	13	Marking sub-panel meet to approve new projects
Spring term	14	Unit Director confirms project allocation and publishes results
Spring term	14	Students begin Research Review
Spring term	-	Research Review reading and supervision
Spring term	23	**Students submit Research Review**
Spring term	30	Feedback interviews conducted and marker comments released
Spring term	30	Students proceed to project
Summer term	-	Individual Project implementation and supervision
Summer term	48	Poster and demonstration sessions
Summer term	52	**Students submit Individual Projects**

[a] Specific submission deadlines, interview and panel dates will become available online