Brunel
UNIVERSITY
WEST LONDON

School of Engineering & Design

Electronic and Computer Engineering (ECE)

MSc INTERIM PROJECT GUIDELINES

MSc Programme

2009-10

Contents

1 Introduction

This document provides valuable information and advice on establishing your project topic, preliminary background work and the writing of the interim report. PLEASE READ IT CAREFULLY. If there is any point in the document about which you are at all uncertain, please consult your Project Supervisor, Tutor or Course Director. You will soon be provided with a further document - MSc Dissertation Guidelines - which will provide advice on the execution of the main part of the project and on writing the Dissertation.

Through the Project you are required to demonstrate your ability to apply and build upon the specialist knowledge you have gained in the taught part of the course and, perhaps more importantly, to demonstrate your capacity for independent, advanced work in an academic and/or professional environment. This will involve most of the following activities: literature survey, critical review, project planning, specification, experiment design and execution, synthesis, analysis, careful documentation, evaluation of results, definition of future work, and preparation of a dissertation report.

A well-executed project and dissertation provide the evidence that you are worthy of the title Master.

2 Project Timetable

The normal timetable of events for Full-time MSc Project students:

First week of February   Project titles and suggestions handed out to students

End of February   Project Topic agreed with Supervisor

End of June   Submission of Interim Report

Please post a hard copy of Interim Report to:

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Uxbridge, Middlesex
UB8 3PH,
UK
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3 Selecting a Topic

You will be provided with a list of project topics by Departmental staff. These will range in detail from a fully considered project proposal to an outline of research activities. Use this period to explore a variety of options. Engage in discussions with your tutor, lecturers, Course Director and fellow students.

Undertake some initial research of your own to assess the topic and acquire some perspective on the material. Professional journals are a particularly rich source of ideas.

4 Defining a Topic

As soon as possible you should define your topic and gain the agreement of a member of staff to act as your Project Supervisor (the MSc Dissertation Guidelines describe the role of the Supervisor). Throughout the project selection process you should bear in mind the following:

What are the necessary attributes of a project?

> It should be clearly relevant to your MSc course subject
> It offers an opportunity to demonstrate a range of intellectual and applied skills developed in the course
> It can be completed in the time available
> It can be completed with the resources at your disposal

What are the desirable attributes of a project?

> It is personally interesting
> It is relevant to your employment prospects
> It contains novel aspects

Having selected a topic you must complete the appropriate form (see Appendix A), which is used to indicate that a topic outline has been agreed between yourself and your Project Supervisor. It also serves to officially notify the Department of your intentions and must be countersigned by your supervisor.

5 Developing a Topic

Having established an outline topic between yourself and your Project Supervisor, you must now begin to sharpen the focus of your project and produce an interim project plan.

In planning your project you should remember the following:

Specific focus:

> The process of project development is usually one of progressive restriction, in which an initial extensive potential field of investigation is progressively narrowed down to one that fits the time and resources available. You are also expected at this point to think more precisely about the objectives of the proposed project.

Attributes to be demonstrated:

> Consider the end-point of the work, namely, what qualities the markers are seeking. These qualities are implicit in the aims and objectives (which should be kept in mind throughout your project work), but for your convenience they are extracted here.

This project work, as reported in the Interim Report and Dissertation, is expected to demonstrate some or all of the qualities identified below. Your project work is intended to develop, and to demonstrate, generally applicable capabilities, as well as MSc-specific skills.

Qualities to be demonstrated

General
- project planning, including keeping to time
- identifying and assembling relevant sources of material
- critical judgement
- analytical capability
- ability to synthesise
- clarity in exposition• • Specific
- familiarity with appropriate investigative techniques: IT and CAD resources, design methods etc.

Subject-specific
- personal understanding of the topic

Three of the attributes are somewhat abstract and require further comment. They are of particular interest in that they do not appear spontaneously as you work through the project plan; you must build them in as the work progresses and especially when writing the dissertation.

Critical Judgement
This means that you should weigh carefully the views of others before espousing them. Indeed, the most important application of critical judgement will be to your own thoughts, results and writing. You must estimate the errors in your data and consider their effect on the conclusions that you draw. You must also try to assess the significance of possible errors in the data and thinking of others.

Analytical Capacity
In a general sense, analysis can be defined as:
> Ordering and structuring of data to produce knowledge

or, even more simply,
> Resolving into simple elements.

The essence is rearrangement of information into a simpler, and hence more useful, pattern. This operation is sometimes carried out using analytical tools: mathematical, computing or statistical processes. However, some analysis is carried out through the rearrangement of ideas and non-numerical information, and is expressed in words rather than symbols.

Ability to Synthesise
Synthesis is virtually the opposite of analysis. Some definitions are:
> Building up separate ideas and facts into a connected whole

and, more briefly,
> Combining or putting together.

This process will take place continually, on a small scale, as you write your dissertation, since every paragraph should display this capacity. On a larger scale, it is applied in the construction of the complete dissertation, in the processes of linking all the elements - objectives, project design, data collection, analysis, and inference - into a continuous stream running from beginning to end of the document.

6 Project Planning

Since the project will probably involve only one person - you - you should not need to deploy a wide range of project-management tools. However, the simple time-plan that we require, in the form of, say, a Gantt chart, is useful in making explicit to you and your Project Supervisor what you hope to

accomplish and how you intend to do it. The construction of the plan will also provide a check on the feasibility of your ideas: can all the things that need to be done be fitted into a reasonable time-frame?

We do not prescribe a particular form of chart, but leave you to construct one appropriate to your project. An initial version is submitted with your interim report.

As the project progresses, you will find the chart helpful in monitoring progress. Almost inevitably, you will find that your progress slips behind your aspirations.

7 Conducting a Survey

The interim report must contain the beginnings of the survey which will ultimately form an integral part of your Dissertation. The starting point will be a quick preliminary survey, to discover something of the 'shape' of the relevant field of information; in doing this you will identify key abstracts, journals, books, series of reports, and so on.
What is the point of a literature survey?: it tells you what has already been done, and provides information relevant to your particular purpose. In addition to facts, you can find methods and procedures appropriate to your project.

The marking scheme for the Dissertation, indicates a distinct mark for the literature survey in terms of the "Quality of Review". However, a significant fraction of the marks for clarity and technical content, and, more explicitly, the bibliography, are also linked to the literature survey, either directly, or through the influence of background knowledge on the development of the project. It must be realised that what is expected in a dissertation is not a simple listing of sources, nor a bald statement of the content of relevant publications, but a critical survey of the more important bodies of information and sources of ideas relevant to your project.

8 Using Information Sources

The most coherent collections of technical information are to be found in libraries, in particular, those with a marked technical bias, or those that are so large that they encompass many fields of technology. All students registered for a higher degree at Brunel University are eligible to borrow books from its Library.

It should be noted that many libraries of institutions of higher education allow anyone to enter and to consult their materials. This access does not extend to borrowing rights, unless special arrangements are made or a fee is paid. Students working in the United Kingdom may also be able to make use of the library facilities of professional institutions, in particular, the Institution of Electrical Engineers (IEE).

Library Resources
Given access to a library, what can you expect to find there? The materials likely to be of interest as you carry out your project are categorised below:

> *Primary sources*
> * Journal articles
> * Conference proceedings
> * Trade papers
> * Reports of agencies
> * Theses and Dissertations
> * Government publications
> * Patents
> * Standards and Codes
> * Specifications
> * Directories

Secondary Sources
- Textbooks
- Review series and articles
- Subject abstracts
- Indexes of publications, etc
- Citation indexes

Tertiary sources
- Handbooks
- Bibliographies

In Technology-related fields, the major limitation of secondary and tertiary sources is their currency, that is to say, the time that has passed since they were published and the even longer time that has elapsed since the information they provide was generated. Primary sources, especially conference proceedings, are up-to-date, but may be difficult to obtain.

For a considerable time, certain holdings of some libraries have been maintained in compact forms such as the micro-fiche. Moreover, significant aspects of their collections are now being made available in computer readable form, often in compact-disc format. This is most likely to be true of the materials most often referred to, namely, directories, citation indexes, and the library-stock indexes themselves. These media often provide much more convenient access to information than the traditional forms, and include facilities for copying relevant matter in paper or machine-readable form.

The library also operates an Inter-Library Loan system which allows access to materials that are not available locally. A charge is made for the use of this facility. Incidentally, in the case of papers, the 'loan' often takes the form of a photocopy which you can retain.

Commercial Information
You may have access to relevant information that has been generated as part of your work or that of an organisation that employs you. There are advantages and disadvantages in using such information. On the one hand, it may relate very specifically to your project, and may allow you to deal with a problem of particular interest to you or your employer. On the other hand, such information may have been recorded in an informal way without independent assessment, and it may be commercial sensitive. This last point is particularly important: you should use such sources for your project only when permission has been given by its owners, usually the company that generated the information, but sometimes the organisation that commissioned the work. The University's staff always treat information that is not in the public domain as confidential, and arrangements can be made to ensure that a Proposal or Dissertation can be kept securely.

The Process of Searching
For almost every possible project topic, there will exist many more potential sources of information than you can read - or even locate. Hence it is necessary to have not only rational methods of finding information, but also a rational way of deciding when to stop.

Search methods may adopt a large number of sources. Your library is a key source, either directly or through inter-library loan and the Internet is another.

The Internet
Everything that has been said about libraries applies to information searches on the Internet and the student should become familiar with search methods. You will find both primary and other categories of information, such as:

- bibliographies
- recent publications, which often appear promptly
- newsgroups where points of interest are discussed
- software packages and tools are discussed or may be available for downloading
- tutorial packages for rapid familiarisation
- commercial product catalogues

Note that net information is very often not refereed, newsgroup discussion can be anecdotal, and packages may promise more than they can provide. Critical evaluation is essential as always. For these reasons, and the fact that net-based information is often transitory, net addresses (eg., http://..., ftp://....., etc) should NOT be used as References, but may appear in a Bibliography. Always use a published source (e.g. published journal, book, etc.) for any material you wish to reference.

Computerised Searches
Of particular value are computer-search procedures that scan the titles or abstracts of papers, to locate 'key words'. The utility of this operation depends on the selection and use of the key words, that is so say, on the 'search strategy' adopted. To be sure that you have located most of what is relevant, you must apply the appropriate key words in conjunction with each other.

Keeping a Record
It is obvious that you should record crucial aspects of your survey, but that is easier said than done. Early on, you will not know what will be 'crucial'. Nevertheless, you should record full details of relevant publications as you encounter them, so that you can readily locate them again. Notes of key points, and photocopies of significant pages, should also be kept. Perhaps the best way of doing this is to maintain a sub-section of an overall project log -- into which copied material can be inserted.

Ending the Search
Enough has been said to allow you to carry out a literature survey, but how do you decide when to stop? When do you have enough? Some ways of answering these questions will be suggested.

Reference to your time-plan will provide an answer of sorts. You might continue your search for and study of the literature for just that period that has been set aside in the plan, and then stop. Of course, if there are some loose ends that can be chased down in spare moments, they can be followed up subsequently. Though not very scholarly, this procedure has much to commend it, in view of the 80/20 Rule which often applies to searches for information:

Finding the final 20% takes ten times as long as acquiring the first 80%.

Another approach is to think about the section of your dissertation that will present the results of your literature survey. Early on you will have produced an outline design of your dissertation. In the space available, how many papers or other publications can you introduce and comment on critically? How many more general works can usefully be included in your bibliography? How many data sources are you likely to draw upon? The answers to these questions will vary from topic to topic, but the total of the numbers is unlikely to exceed, say, thirty. That is not to say that you should stop when you have identified thirty relevant sources. However when you have found thirty highly relevant publications, the addition of another will probably displace one already on your list. Thus the law of diminishing returns has begun to operate.

However you decide to terminate this phase of your work, you should not allow it to occupy much more time than has been agreed with your Project Supervisor, without contacting him or her to propose a restructuring of the entire project. That said, you should keep an eye on current publications throughout the period of your project, in case anything really relevant to your work appears as you work.

9   The Interim Report

The interim report should be approximately fifteen A4 pages (plus bibliography) and should include:

- *Introduction*
    This section should briefly overview the project topic.

- *Background to the project*
    This section should provide a more detailed review of the technical field, largely based upon survey material.

- *Initial survey*
    This survey is a quick preliminary survey, to discover something of the 'shape' of the relevant field of information; in doing this you will identify key abstracts, journals, books, series of reports, and so on. Key technical issues will be summarised.

- *Aims and Objectives*
    A clear statement of the Aims and Objectives. Remember, aims and objectives are generally a statement of what is to be achieved, not how it is to be achieved.

- *Experimental/investigative methods to be adopted*
    An outline of the key activities necessary to complete the project, itemising the experimental methods to be used (in, for example, a design-based project), or the investigative techniques to be adopted (in the case of, say, a critical survey).

- *Time-plan*
    Strongly related to the key activities identified above.

- *Deliverables or specific outcomes*
    A clear statement of the expected outcome(s).

The report must be submitted to your Project Supervisor, bound to an appropriate standard.

This Report must also be bound at the back of the Dissertation when the latter is submitted, and its relationship to the actual pattern of work on the project should be considered in the Dissertation.

It may be that the Introduction and Background sections can be carried over into the dissertation with little alteration. Similarly, the initial survey work may be developed and carried forward. This is an instance of a habit you should seek to develop: building up the final report (in this case, the dissertation) as you proceed. This process has much to commend it in terms of efficiency and elimination of errors.

In view of earlier exchanges of ideas with your Project Supervisor it is unlikely that your Interim Report will contain anything that will be severely criticised. However, your Project Supervisor will make further comments after reading the report, and these will help you in fine-tuning your plans.

You will not be informed of the mark assigned to the Interim Report, but a letter grade will be given, to provide an indication of your progress to that point. Strictly speaking, all marks are subject to moderation by the Board of Examiners, and by the External Examiner in particular.

Appendix A : Notification of Project Topic

Electronic & Computer Engineering

MSc Projects

Please email the form below to Dr Maozhen Li (Maozhen.Li@brunel.ac.uk) once you have decided a topic for your project.

NB: Please note that any one project supervisor is limited to the number of projects he/she can supervise and therefore an early decision on your project is in your best interests.

MSc Project Topic 2009/10

Name:..

Student ID: ....

Course:.....MSc Distributed Computing Systems Engineering...

Project Title:...

Project Supervisor:..

Date:..