Department of Engineering and Mathematics
Faculty of Arts, Computing, Engineering and Sciences

Project Guidelines for Courses Using the Project Module 16-7150 (April 2007 Re-validation)

MSc	Advanced Design Engineering
MSc	Advanced Engineering
MSc	Advanced Engineering and Management
MSc	Advanced Manufacturing Engineering
MSc	Advanced Materials Engineering
MSc	Advanced Mechanical Engineering
MSc	Forensic Engineering
MSc	Logistics and Supply Chain Management
MBA	Industrial Management
MSc	Computer and Network Engineering
MSc	Electronics and Information Technology
MSc	Telecommunication and Electronic Engineering
MSc	Railway Infrastructure Engineering
MSc	Advanced Engineering Metals
MSc	Materials and Manufacturing Management
MSc	Embedded Systems,

Apr 2012

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1. INTRODUCTION

In order to obtain an MSc or MBA, it is necessary to undertake a major individual project. This project must be demonstrably at Level 7 in terms of the work carried out and the critical reflection and analysis evident in the report. Students and staff must carefully follow these guidelines in order to ensure the efficient progress and assessment of projects.

It is now mandatory to assess risks involved in project work. This concerns potential hazards that students may encounter in laboratory environments, computer suites, unsupervised environments (for example, evenings and weekends) and collaborating companies. ***Students may not proceed with their project work until the necessary clearance has been obtained.***

This project module includes a Research Methods element which is worth 15% of the 60 credits of the project module. This is supported by separate documentation available on the postgraduate project module Blackboard site. It may vary somewhat in style and content from course to course. Typically, its assessment might involve the submission of an acceptable project specification form (including the time plan), risk assessment, research method and preliminary literature review of the relevant field of work. This would normally comprise around 3000 words and should be submitted one month after project start date. Details of the marking scheme and hand in dates will also be made available on the project Blackboard site. The material submitted for the research methods element must also be included in an appendix to the main project report (see later in this document)

It is not possible to be awarded the 15% for the Research Methods element separately from the 60 credits for the entire project.

2. AIMS

The project is a central and very important activity within all Postgraduate courses. The main aims of the projects are to:

- Provide a realistic exercise in the practice of engineering at an advanced level, including an element of originality.
- Be a vehicle for integrating knowledge from several subject areas.
- Provide a task of the intellectual depth appropriate to a Masters qualification.

3. CONTRIBUTION TO THE DEGREE CLASSIFICATION

Your project mark makes a significant contribution to the degree and hence to the degree classification (e.g. whether or not you get a distinction).

Programme	Credits	% Contribution to Overall Mark
MSc and MBA	60	33%

4. STRUCTURE

Projects, irrespective of the subject discipline, include a number of major tasks:

Problem identification

Students need to identify suitable and challenging problems for their projects. There are two broad types of project. These are design-and-implement projects and investigative projects.

Investigative projects may be associated with the research work of members of staff in the University, or may arise from an industrial problem with an uncertain solution. It is, perhaps, less likely that this will be the type of project carried out by a student working in industry. Such projects often lead to the student being a joint author of a publication, which is good for the CV and raises the national profile of the Department. In these cases, because investigative projects cannot always lead to a positive outcome (e.g. to new knowledge or a new product) the assessment will emphasise your effort, competence, and achievements. Thus, no student would be penalised if the project was unsatisfactory through no fault of their own. However, especially at Masters level, a thorough critique would be expected of any unexpected aspects of the project. Investigative projects can be very interesting and will certainly develop a range of abilities and bring your knowledge of the topic to the state of the art.

Industry-oriented projects carried out with industrial support and collaboration are encouraged, and are naturally the most likely type of project to be carried out by students employed in industry. The project should either be a real project, which will enable the student to apply the knowledge acquired during the course of study; or a realistic simulated situation having the same characteristics. Industrially-based projects promote an awareness of the practical issues facing engineers in industry and provide excellent experience for those not yet employed in industry but wishing to have an early industrial appointment in their career. When carrying out industrially related projects the following must noted:

A mentor (possibly your line manager) must be appointed as an “industrial supervisor”. S/he will be your day-to-day contact for discussing the progress of the project and resolving practical difficulties. S/he will not, however, contribute to the marking of the final report.

An academic supervisor must be appointed, who will advise on the academic level of the work, and hence its suitability as a Masters level project. S/he will also advise on any academic problems and on the preparation of the final report if required, and will assess the report. It will be second-marked by an academic moderator.

The project must meet the required MSc/MBA level of standard and originality. A synopsis submitted at a very early stage will be used to assess whether this is the case. If the project requires specialist facilities, it must be confirmed at the outset that these will be available.

When a project is carried out in collaboration with other staff in industry, the student must specify exactly what will be his/her contribution to the overall and final ‘product’.

Project formulation

Having identified a suitable problem, it is necessary to consider other constraints such as time, cost and technical limitations in devising a practical work plan. This is carried out, typically over several weeks if you are working, as part of the Research Methods assessment. An appropriate methodology/technique should be identified in

consultation with knowledgeable individuals in the industry concerned, and the Course Leader or other academic advisor. Any potential hazards that the student may encounter should be discussed at this stage. These items form part of the specification, and a full specification must be completed, assessed and passed before work is commenced.

Literature survey
A literature survey is essential to discover and report on what has already been done in the chosen area of work, and by which experimental and theoretical techniques. This allows the student to understand the problem area in detail, provides insight into how similar problems have been addressed in the past, and provides a background against which the project can be judged in terms of relevance, importance and novelty. The Learning Centre provides a variety of resources such as CD-ROMs, databases, journals, internet access and on-line searching facilities (which are also available off-site via the internet). Submission of a preliminary literature review together with the specification and research method/approach normally marks the end of the Research Methods phase of the project.

Project management and execution
It is the student's responsibility to complete the project on time. Late submission is not allowed (the mark is set to zero). A poor quality project can seriously affect the final degree classification (e.g. the possibility of obtaining a merit or distinction). Students should keep their academic supervisor informed about the progress made. Students must maintain a logbook to record the progress of project work.

Project assessment
The degree of originality/novelty will be one of the factors taken into account in deciding the classification of the project. This might refer to the extension of the specification of some previously engineered item, to some new design aspect, to a novel solution to an old problem, to the application of an established method to a new problem, to a new, cheaper, or improved product, to a new discovery, etc.

Some project guidelines
Allow for mishaps! Don't leave assessments until just before the deadline.
Always remember that computers can crash, and materials can get lost or stolen. Therefore always back up your project work. Failure to do so will not be accepted as a reason for not completing on time. You have been warned.
Read around your project topic and carry out a comprehensive literature survey. If the project is a continuation of ongoing work at SHU, obtain the previous report from your supervisor.
When carrying out your project, be methodical. For example, constructing a complex electronic system or software simulation without proper testing of its building blocks could cost you a lot of wasted time and effort.
Be aware of the project deadlines and meet them. Failure to meet deadlines carries a severe penalty (loss of all marks) in accordance with the Faculty regulations.
If you have difficulties completing your project or making the required progress, raise this immediately with your supervisor (if it is an industrial project, try your industrial supervisor before your academic supervisor, as s/he is likely to be more familiar with your problem). If you have any problems in this regard, then contact your Postgraduate Programme Manager in the Faculty of ACES. If it becomes apparent that, for good reasons, you will not be able to complete your work by the deadline, then you must submit an Exceptional Extension Request form (EER1) to your course administrator at

least 24 hours before the deadline, but as early as possible.

Project dissemination/assessment
Dissemination of results is as important as the carrying out of the project. The dissemination of results is by means of the final report. If industrial confidentiality is absolutely necessary, then it can be arranged – but the University needs to know this at an early stage of the work.

5. CONSIDERATIONS

The following aspects should be considered before the project arrangements are finalised:

Subject relevance
The project must be relevant to the course of study. Course knowledge will most likely be involved. The project may involve the need to learn new material, possibly not covered in the course, but this must be relevant to the degree being pursued.

Technical content
The project must have a substantial technical content requiring the use of modern technology/engineering techniques. The student must therefore have some understanding about the methodology and/or techniques involved. If there are any doubts, the subject specialists in industry or the Faculty should be contacted as appropriate. Please note that book based projects (i.e. a straightforward evaluation of published material) are not allowed.

Project management
This is an important aspect of the project. The student should identify the major phases of the project and estimate the time needed for each phase, making sure that all activities fit within the time available. A week-by-week plan is essential, and will be expected to form part of the specification resulting from the Research Methods section of the work.

Resources
The resources required for a project must be clearly identified at the start of the project. Equipment, materials and manpower (e.g. technician assistance) need to be considered. Requirements for any special equipment should be discussed with the project supervisor well before the project begins.

Health and safety requirements (risk assessment)
It is essential that you consult your supervisor and other relevant staff about health and safety aspects of your project. Within the University, you must follow all safety procedures specified by the technical staff. In industry, the local health and safety regulations must be fully observed, but it is still necessary to produce a risk assessment for the University. Usually, a copy of the risk assessment carried out in the industry will suffice.

6. PROJECT DEVELOPMENT

Project ideas may be proposed by the student, either as their own idea or suggested by industry. For non-industrial projects, projects may be chosen from a project list provided by the faculty, or by contact with individual staff members. If a project list is

used, some of the titles may be derived from and associated with the research work being undertaken within the Faculty. As such they will probably offer involvement in state-of-the-art work and will contribute to the technical standing of the Faculty. Successful work may result in publications which enhance the reputation of the faculty and provide a good start to an engineering career.

A starting point for industrially-based projects could be your own work on industrial placements. Perhaps some interesting problems may have already been identified which need more focused research to solve them. Colleagues at work may also be able to suggest problem areas that may be developed into projects. Areas of potential project work can be discussed with industrial colleagues or the Course Leader.

Although you may undertake project work at your company, your academic supervisor must be aware of the details and will require that your work provides an appropriate challenge and standard (if it doesn't, you will be referred and will have to repeat some, or all of the work). The supervisor may make one or more visits to your workplace during the project. Work carried out before the commencement of the formal project period may not be presented for assessment, although previous work may be referenced.

7. PROJECT SUPERVISION

In the case of industry-based projects, if the demands of an industrial partner conflict with the educational requirements, then the academic supervisor will need to ensure that the educational needs of the student are met, otherwise the project may not reach the required academic level, leading to referral. A moderator from the academic staff (i.e. a second marker) will be appointed for each project in order to participate in the assessment procedure. The second marker will be appointed by the project officers taking into account any suggestion by the supervisor and the individual project workloads of potential second markers.

8. PROJECT TASKS AND DOCUMENTATION

Project Specification

At an early stage in the Research Methods workshop, students will be required to submit a brief synopsis of their proposed project. This will be assessed for initial approval of the topic with respect to the likelihood of its providing the required academic level. In the case of industrial projects, it is expected that the synopsis will also have been agreed by whoever is likely to be the student's mentor (industrial supervisor), so that the project is acceptable from an industrial / employment viewpoint. As the final part of the Research Method workshop, the project specification form must be completed with full details of aims and objectives, work planning, risk assessment etc. The academic supervisor must approve details of the project specification. The objectives and tasks undertaken may be modified as the project progresses. Such modifications should be discussed with the supervisors.

Risk assessment

It is now mandatory to assess the potential hazards/risks involved in the execution of the project. The students should not proceed with their project until the necessary clearance is granted.

Log book
Students should maintain a logbook to record ideas, progress made, results, data and other relevant information. The logbook may be used to assist discussions with the technical staff and supervisors, and will be an important reference for preparation of the final project report and any other relevant documentation. The log book should be presented for assessment during the viva-voce (see below).

Final report
The project report will be in the style of a structured dissertation exhibiting critical analysis and evaluation, and technical (or business/management) depth appropriate to Masters level. It should be written concisely to describe the work carried out and its findings. A draft copy of the final report should be submitted to the supervisor at least three weeks prior to formal submission of the report. Please see the **Appendix** for more information. The department of Engineering and Mathematics requires high standards in report writing and significant faults in the project report will result in the report being returned unmarked to the student for resubmission.

Viva Voce and Demonstration

The Viva Voce is an interview session arranged between the project student, supervisor and moderator once the project report has been initially assessed. It is the student's responsibility to arrange the viva voce at a suitable time and location to all attending. It will be used to demonstrate that the student has a good understanding of the work submitted and that the work has been carried out by the student. During the viva voce the student will be expected to defend the findings of the project. The student may wish to demonstrate computer packages developed or to show laboratory procedures, hardware etc. The Viva Voce will help the supervisors to decide on a final mark for the project.

APPENDIX

PREPARATION OF THE FINAL REPORT

Purpose: To document all major aspects of the project.

Length: 10,000 - 15,000 words, single-sided, double-spaced,

Submission: Forward **two** (2) copies to Postgraduate Reception in the Harmer Building. Address both of them to your supervisor, who will redirect one of them to the second marker. You must also submit an electronic copy to your supervisor.

Report
Presentation: Report covers will be supplied.
Reports should be **Thermally Bound** (student's responsibility).

Format:

Title
The title of the report should be short, descriptive and objective.

Writing Style
The style of writing adopted should generally be objective, formal, impersonal and written in the third person, past tense. The work should be reported clearly and concisely, arranging points relevant to the argument and omitting non-essential matter. The report should be written so as to be comprehensible both to the specialist and to those with only general knowledge. The student should aim to write for his/her peers, rather than the general public.

Margins

Left margin (binding edge)	40 mm
Right margin	25 mm
Top/Bottom margins	25 mm

Font
Arial 12pt font should be used for the majority of the text. Different fonts may be used as necessary for mathematical expressions or emphasis.

Report Contents
The main body of the report should be organised into logical sections as follows:

Title Page (see below)
Preface (see below)
Acknowledgements
Abstract
The abstract should succinctly summarise the entire report (*including the conclusions*) and should be limited to one page. In some reports the abstract may take the form of an executive summary

Contents
Table of contents, with page numbers, so that material is easy to locate.

Nomenclature (if applicable)
May also be extended into a glossary of terminology if unusual terms are used.

Introduction
Background to the problem, importance and relationship of the work to previous work etc., aims & objectives.

Critical literature survey
Usually it is advisable to write this as a separate section however it may be integrated into other sections of the report if desired, but it is vital that it is present and identifiable.

Relevant Theory and Analysis
There should be a theoretical section in most reports. The theory of the methods and analysis techniques etc. must be included.

Approach/Methodology/Experimental Procedure

Outcomes and/or Results

Discussion of Outcomes and/or Results
These should be discussed **critically**. Experimental and theoretical errors should be assessed or measured and should be incorporated in the results. Results should be compared with those predicted theoretically and their reliability assessed in the light of the estimated errors.

Critique
Critically compare your achievements, the project outcomes and actual timings of the plan of work with the original specification. Discuss and comment on discrepancies. (Costing , discuss the costing of the project if appropriate.)

Conclusions & Further Work
These should be based upon the work described in the report. Recommendations should be included. Conclusions should not contain any new technical matter.

References (see below)
References must be correctly cited both in the text of the report and in the reference section. Referencing is a process which requires significant attention to detail and concentration. Errors in referencing are considered a serious problem with the work and will normally result in the report being returned to the student unmarked for correction. It is very important to ask for guidance on referencing if problems exist or individual students are unsure about how to present and use their references

Appendices
As required. Published data (e.g. application notes, data sheets, COSH sheets etc.) should not normally be included as appendices. Advice should be sought from supervisors where a question arises as to what should be included in a appendix for a particular report. A copy of work previously submitted for the Research Methods element of the dissertation must also be placed in a separately bound appendix. Failure to do this will mean that a mark of zero will be recorded for Research Methods.

General points applicable to the whole report

Numbering
The headings should be numbered consecutively. Sub-headings numbered 1.1, 1.2 etc., may also be used. Figures, tables, displayed equations, references and appendices should also be numbered consecutively. This may be done on a chapter-by-chapter basis or on a complete report basis.

Diagrams and Tables
Figures or illustrations will be of two kinds, line drawings and photographs. Each figure should have a descriptive caption and they should be numbered consecutively throughout the text. Figures and photographs may be in black and white or colour, but must appear the same in every copy of the report. Tables should be titled and numbered. Each column should have an explanatory heading. Tables should be referred to within the text by number. Diagrams and Tables should be of the highest quality.

Units
The physical quantities, units and numerical quantities should follow the SI system (International System of Units) whenever possible. When other units are used (e.g. BTU, BHP etc) then the use of these units must be justified. If non SI units are used then great care must be taken to ensure the reader is aware of the fact.

References
Follow the Harvard Referencing System. Please refer to the separate comprehensive guide “Citing References” which can be found on the Project Blackboard Site and on the LC website. If in doubt seek advice on referencing.

Front Cover Sheets are available from Postgraduate Reception in the Harmer Building.

The Title Page and the Preface Page should be as detailed on the following page.

TITLE PAGE

_____ UNIVERSITY

Faculty of Arts, Computing, Engineering and Sciences

[PROJECT TITLE IN FULL]

BY

[STUDENT'S NAME IN FULL]

[COURSE NAME IN FULL]

[MODE OF STUDY]

[ACADEMIC SESSION]

PREFACE PAGE

This report describes project work carried out in the Faculty of Arts, Computing, Engineering and Sciences at Sheffield Hallam University between [start month] and [finish month] [year].

The submission of the report is in accordance with the requirements for the award of the degree of [*full name of the degree*] under the auspices of the University.

PROJECT SPECIFICATION FORM

Faculty of Arts, Computing, Engineering and Sciences
Department of Engineering and Mathematics

Project Specification Form

	Surname	Initials
Student		
Industrial Supervisor		
Academic Supervisor		
Moderator		
Course		
Industrial Collaborator		

1. Title
(The essence of the proposed work should be captured in the title and be as informative as possible.)

2. Background
(Introduce the industrial and academic context of the work.)

3. Aim & Objectives
(Identify the overall aim of the project and the individual measurable objectives against which you would wish the outcome of the work to be assessed.)

4. Work programme
(Describe the programme of work and the milestones that can be used to measure its progress.)

5. Deliverables
(Outline the major deliverables of the project – usually tangible things which would not have existed if the project had not happened – perhaps a new, or modified, piece of equipment; perhaps a measurable increase in production or decrease in maintenance or wastage; perhaps a report or conference paper explaining some new findings)

6. Resources
(Identify the resources required to carry out the above programme of work.)

7. Beneficiaries
(Show who is likely to benefit from the proposed work.)

8. Risks/Hazards
(Identify any potential risk/hazards involved in the project) Each project must have a completed risk assessment form. For work wholly completed away from the university a company risk assessment form (or equivalent) must be submitted at the same time as the project specification. If in doubt seek advice from university technical staff or supervisors.

Student		Academic Supervisor		Subject Group Leader	

9. Work plan
(Illustrate the work plan with a Gantt chart.)