

School of Electronic, Electrical & Computer Engineering

**Final Year MEng Research Projects 2013-2014**

Read this document through carefully.

Ignorance of its contents will not be accepted as an

excuse for failing to carry out the project requirements.

Any ambiguities must be resolved in writing by the

Project Coordinator and may not be used as a mitigation

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# Final Year MEng Research Projects 2013-14

## 1 Overview of final year project

The final year project represents the major learning activity where the emphasis moves away from a structured environment and places the responsibility firmly on you. **Thus you will be primarily responsible for establishing the content, conduct and deliverables of the activity.**

For the MEng programmes about half of the final year is devoted to work on individual projects, designed to develop and demonstrate powers of initiative and independent thought. Some projects will arise from the research programme of research groups within the School, others will originate from industrial partners - all are expected to contain a level of research, design and development. **The project is worth 60 credits towards your final degree.**

Project allocation occurs at the end of the Summer vacation. As soon as your Supervisor has been allocated, you should make contact with your supervisor to formulate your project specification and plan for tackling the project.

An initial report outlining your intentions and work plan together with preliminary design work should be submitted to the Postgraduate Office by noon Wednesday 23rd October 2013.

Your supervisor will normally make available an average of half an hour a week to discuss and review your project work. You will maintain a formal record of these meetings using the standard meeting form. These will be examined as part of the project assessment process. It is your responsibility to keep your supervisor fully informed of your progress and to instigate meetings. Unless you see your supervisor, he/she cannot give the support and advice you may need, and he/she cannot ensure that the examiners are fully acquainted with the circumstances of your project. Neglecting to see your project supervisor often enough is the most serious mistake you can make on your project.

### 1.1 Problems or queries

Dr Mike Spann, (Room 415: email M.Spann@bham.ac.uk) is in charge of the final-year projects. You may contact Dr. Spann either by email or by attending his office hours - please see the final year timetable for details. If you use email you must put **‘MEng FYP2013’** into the subject of the email. This way Dr. Spann will be able to sort your emails and deal with them more efficiently. In general your project supervisor should be able to deal with most queries relating to the project and you should contact them in the first instance.

Administrative support will be provided by Sam McCauley (S.O.McCauley@bham.ac.uk) in the Postgraduate Office.

### 1.2 Important Project Dates

|  |  |
| --- | --- |
| Supervisor allocations form e-mailed to Dr Spann and Sam McCauley | Friday 13th September 2013 |
| 1st meeting with Supervisor | Week 1 |
| Project induction | 30th September 2013 |
| Project Title and Outline e-mailed to Sam McCauley along with risk assessment and general ethical questionnaire. | Friday 11th October 2013  |
| 1st Report emailed to Sam McCauley | Wednesday 23rd October 2013  |
| Technical Presentation | 9th-10th December 2013  |
| 2nd Report | Friday 13th December 2013  |
| Bench Inspection | 24th – 25th March 2014 Many students prepare a poster which will also be used during Project Open Day |
| Final Report | Monday 14th April 2014 at 12:00 |
| Project Open Day Presentation | 1st MayA poster conforming to University guidelines is required for this assessment. Templates will be available on WebCT |

### 1.3 Duration of project

You will be able to undertake experimental work during the Autumn and Spring terms. The laboratories will be open for project work from 9.00 a.m. to 5.00 p.m. Monday to Friday only.

You are required to submit reports as explained under “Assessment” below. This includes reports at the start and end of the autumn term as well as a major report at the end of the spring term.

A project assessment will take place at the end of the autumn term. Here all students will give a formal presentation on their project.

Final reports on projects must be submitted via WebCT with logbooks being submitted to the Postgraduate Office during the Easter vacation. Postal submission by first-class recorded delivery post is acceptable. Evidence of posting must be retained. The normal penalties for late submission will apply.

Early in the Summer term is the Project Open Day where you are required to discuss your project with the External Examiners, staff, parents and students. A range of industrial representatives attend the Open Day, including members of the Industrial Liaison Committee. Some of those attending will have suggested and perhaps sponsored projects; others may be head hunting. A number of recent students have made contact with their future employers at Project Open Day, so creating a good impression is important.

### 1.4 Laboratory Equipment, Component Stores and Project Budget

Information regarding projects, how to use the Component Stores, PCB fabrication and miscellaneous technical information is available on the technical support website at http://www.eee.bham.ac.uk/techsupp***.*** You are strongly recommended to consult these pages.

Projects will be carried out either in the MEng Project Laboratory (Room N216) on the second floor, or less usually, in a laboratory of one of the research groups[[1]](#footnote-1). In the main laboratory a “Hot-seat” scheme is in operation where students are not allocated a specific bench, but work at whichever one is free on a day-by-day basis. Each bench is equipped with a standard set of equipment, comprising of:

1. BWD Multifunction test unit comprising:

(a) Function Generator

(b) Power Supply +/15 Volts and +5 Volts

(c) DVM

(d) Frequency Counter

(e) Amplifier

2. Tektronix TDS210 (or TDS1002B USB interfaced) Real time digital storage scope

3. A Networked PC

You must check with your supervisor that the bench space and the standard set of equipment is suitable for your project, otherwise your supervisor must arrange for the project to be conducted in a research area.

Test leads and additional test equipment, if you are working in a research area, are available for loan from Mr. David Checkley in Room N206 between 2:15 p.m. and 2:45 p.m. daily. Students issued with equipment are responsible for ensuring its security against theft and loss and will be required to pay the full replacement cost for any damage or shortage.

Each student is allowed a budget of £100. Books and tools may not be purchased on the project budget. Expenditure beyond this limit will not normally be permitted unless special arrangements are made with your supervisor and agreed with the Project Coordinator. The Component Store is open from 10:00 a.m. to 1:00 p.m. and 2:00 p.m. to 4:00 p.m. daily to enable staff, students and researchers to obtain electronic components, tools, stationery and computer consumables. Everyone is able to use the facility, using the internal budgeting system for project and funded purchases. Additionally, Undergraduates are able to make cash purchases from the stores for items directly related to their course. The stores are located in the Metallurgy and Materials building.

Full details on how to use the Stores and a location map is available on the web site at <http://www.birmingham.ac.uk/schools/eece/about/index.aspx> you then need to click on the health and safety link and enter your university username and password to access this resource.

Components not available in the Stores may be purchased from external companies by filling in the web-based form that is accessible from the Technical Website address above. Students are able to check the progress of their orders here. Orders are normally processed weekly on a Thursday. Delivery times vary from supplier-to-supplier and it is wise to check delivery times before placing an order to ensure that your work will not be held up by long delays. It is up to you to plan your work to take account of possible delays.

### 1.5 The Teaching Resource Room N206

This area is your main technician contact room. It has a library of data books from major manufacturers that are available for reference; these should not be removed from the room. A small selection of free-issue components such as resistors, capacitors and cables are available from here for use in your project. Telephone, surface mount and heavy soldering facilities are also available in this room; please ask the technical staff for help prior to using any facilities. Software, manuals, books, components, etc, purchased from final year project funds, must be returned to Mr. David Checkley at the end of the project.

### 1.6 Logbook

You are required to maintain a detailed log book covering all aspects of your project work. You should take your log book to every meeting with your supervisor. The log book will be examined during the bench inspections as part of the assessment. You should use your logbook to record all of your activity on your project. The ability to keep a good logbook is an important skill for an engineer.

### 1.7 Project Progress Reporting

#### 1.7.1 Student’s actions

Before each meeting with your supervisor, you should fill in the “Progress since last meeting” section on the “Meeting form”. This form should then be stapled into your log book, or kept safely in a dedicated folder, and should be taken along to each meeting with your supervisor. These sections should be discussed with your supervisor at each meeting. During the meeting you should discuss with your supervisor a list of aims and actions to be completed before your next meeting, and you should write a summary onto the form. At the end of the meeting, you and the supervisor should sign the form.

Copies of the “Meeting form” can be obtained from the General Office. If you have to miss a meeting, then you should inform your supervisor in good time. Failure to attend meetings without prior notification, or failure to produce the “Meeting form” at the appropriate times will be interpreted as a sign that you are not taking your project seriously.

At the end of the term, part of the assessment of your project will be through a bench inspection, in which you give a presentation about your project, and a demonstration of what you have got working, to an assessment team. As part of this, the assessment team will inspect your log book in order to see that you have kept good records of your work and your thinking throughout the project. A good set of well-completed Meeting forms is one ingredient that can help demonstrate to the team that you have been planning and recording progress well.

#### 1.7.2 Supervisor’s actions

During each meeting, your Supervisor will check that you have attached a copy of a completed Meeting form into your lab book or folder. They will discuss the “Progress since last meeting” section on the Meeting form with you (the student) and write appropriate comments on the form in the space provided. An action plan will be discussed with the student and will be summarised (by the student) on the form. The form should be signed by both supervisor and student.

On the “record of meetings form” the supervisor will record the date on which the meeting was arranged, and record confirmation that the student attended and that a Meeting form was filled out during the meeting. If a student persistently fails to attend or persistently fails to produce the required Meeting form, then the postgraduate office will be notified.

### 1.8 Printed Circuit and Photographic Work

Requests for printed circuit board manufacture should be made to Mr. David Checkley in Room N206. PCB costs will be charged against your project budget. Whenever possible, layouts should be generated with the ARES software that is available on the computer network. It is essential that you read the relevant section concerning PCBs on the Technical Support web site before starting work. Printed circuit boards will only be made if the work is submitted with a completed proforma, available on the technical support website and signed by your supervisor. You should only use the School PCB manufacturing facilities as a last resort - making PCBs for aesthetic reasons is not effective use of your time. Assembling circuits on breadboard or strip board may be more efficient and effective.

A digital camera is available for short-term loan from the Teaching Resource Room N206.

Students wishing to reproduce waveforms from an oscilloscope should use the special Oscilloscopes available from Room N206 (please read the instructions on the web site).

### 1.9 Photocopying

You are responsible for any photocopying charges that you may incur. You may use any convenient copying bureau facilities. Students who wish to make photocopies can either use the machine in the General Office or in the Ground Floor Learning Resources Room.

### 1.10 Mechanical Workshop

Students may carry out their own metal/wood fabrication work in the mechanical workshop under the guidance of Mr. Warren Hay and Mr. Adnan Zentani. The workshop is located in the Metallurgy and Materials Building. Prior to going to the workshop you should discuss in detail with your supervisor your chosen design.

### 1.11 Safety, Morality and Legality

Students must read the safety notes issued to them before commencing any work, a copy is also available on the website.

It is now mandatory that all work and projects be assessed for hazards before the work commences. A risk assessment form is available on the website (in the safety section on the Technical Support website), along with a project resource allocation form and MUST be completed. Should this form identify any risks or hazards you MUST consult your supervisor before carrying out any work.

You may be questioned explicitly about risks and safety measures during your bench inspection and failure to consider this aspect of the project adequately will be heavily penalised.

A statement about safety will be expected in the final report. In many cases, i.e. software only project, this will simply be “No Safety Hazard”, but you must think whether any potential safety hazard exists. Be aware that non-electrical hazards (sharp objects, rotating machines, tripping hazards, obstructions that may cause injury, hot objects, etc) account for most accidents. It is the duty of all students to ensure that their work is carried out in a safe, legal and moral manner.

### 1.12 Ethical Considerations

You are strongly cautioned about the legal risks of working with human subjects (questionnaires, experiments, etc). Any such work must be vetted by the Human Research Ethics Committee before commencement and you should seek the guidance of your supervisor (forms attached). Work with persons under the age of 18 is specifically forbidden.

## 2 Assessment

Final-year MEng projects are assessed as indicated in table .

|  |  |
| --- | --- |
| First Report | 5% |
| Second Report | 5% |
| Technical Presentation | 5% |
| Final Report & Bench Inspection [Assessment Team] | 0.666(70% + 14%) |
| Final Report & Supervisor’s Report [Supervisor] | 0.333(70% + 14%) |
| Project Open Day Poster Presentation | 1% |

Table 1: Final year MEng project assessment.

Each assessment will be closely matched to the National QAA UK-SPEC benchmark statements and implemented with respect to the following sentences. **Much of the study undertaken at MEng level will have been at, or informed by, the forefront of an academic or professional discipline. Students will have shown originality in the application of knowledge, and they will understand how the boundaries of knowledge are advanced through research. They will be able to deal with complex issues both systematically and creatively and they will show originality in tackling and solving problems. They will have the qualities needed for employment in circumstances requiring sound judgment, personal responsibility and initiative in complex and unpredictable professional environments.**

### 2.1 First Report

The primary aim at this stage is to ensure that you discuss the project with your supervisor and undertake any necessary preparatory work, especially planning and reading the engineering literature.

This should be submitted by 12.00 noon on Wednesday, Week 4, of the Autumn term. In it you should:

• state, in your own words, the aims, objectives and research challenges of the project;

• give your proposals for carrying out the project, as far as possible at this stage;

• indicate where the main effort will need to be concentrated;

• state what you see as the main technical difficulties of the project;

and present:

• a detailed management plan (e.g. as a Gantt chart or a week-by-week timetable);

• a specification of any special items and facilities needed;

• a costing;

• a literature survey of any background reading carried out so far, including a properly detailed reference list;

• evidence to show that you can start effective work on the project with immediate effect;

• a statement of the safety implications: any hazards and necessary precautions. This must be done even if the conclusion is that there are no safety hazards, e.g. in a software project.

• a statement of the ethical considerations and completed the Human Research Ethics form contained in the appendix.

Please do not use the above list as headings in your report. Please read the attached assessment sheet before writing the report and remember that the assessor is looking for evidence that your project is well underway. Conciseness in the main body is important, so this report will normally be quite short, typically 12 pages (excluding the vital technical appendices). Your Supervisor will mark your report. If you are awarded a fail grade on this report, or are late in submission, you will be interviewed by the Final Year Project Coordinator and possibly the Head of Academic Programmes. You will receive a copy of the completed assessment sheet.

### 2.2 Second Report

The second report should be by noon on Friday of the last day of the Autumn term. In this report you should include:

• an introduction to the subject area of the project pitched at a level that other final year students should understand

• an extensive literature survey

• a progress report

• a summary of design and theoretical work as appropriate

• details of the work still to be undertaken and a management plan for the second term’s work

• a costing to date and future projections.

• technical annexes providing tangible evidence of your progress and achievements

This report represents a ’dummy run’ for your final report and should be stand-alone and of high quality. Please do not use the above list as headings in your report. Please read the attached assessment sheet before writing the report and remember that the assessor is looking for evidence that your project is well underway. The layout of the report should be clear, logical and concise, please consult your supervisor if in doubt. No guidance is given about report length, as a suitable choice is part of the assessment criteria. If you are awarded a fail grade, or are late in submission, you will be interviewed by the Final-Year Project Coordinator and possibly the Head of Academic Programmes. You will receive a copy of your completed assessment sheet.

### 2.3 Technical Presentation

The Technical Presentation is held at the end of the autumn term. A member of the Assessment team will chair the presentation and your supervisor (not mandatory), plus a second member of the Assessment team, will attend your talk. The members of staff present will assess the presentation. The presentation should take 20 minutes, which includes 15 minutes for the talk and 5 minutes questions.

There may be an overhead projector and a data projector available for your presentation in some of the allocated rooms. You may connect your own laptop to the projector (if one is present). Please make sure any electronic presentation works, as you will not be given any longer than your allocated time.

Any 4th Year student may attend any of the presentations. The assessment covers:

• structure and organisation of talk, use of visual aids, time keeping, clarity of explanations, etc

• apparent progress

• tangible evidence of achievements - demonstrate working system or sub-systems

• ability to answer questions

Video recording equipment is available for you to practise your presentation. This can be booked via Mr. David Checkley in the Teaching Resource Room (N206).

### 2.4 Bench Inspection

The Bench Inspection is carried out during Week 11 of the Spring term. The Bench Inspection Team consists of two project team assessors and (possibly) the project supervisor as an observer. You are expected to give a 10-15 minute presentation (this may be subject to change) on the project using appropriate visual aids (in addition, the majority of students generate a poster to be used again on Project Open Day). As this is a bench inspection you may be questioned during your presentation. The assessment covers:

• adequacy and quality of the presentation

• your ability to answer questions.

• completeness and legibility of the log book

• your project achievements (including working demonstrations, etc)

• tangible evidence presented to assessment team to ease their task

### 2.5 Final Report

The report is assessed by the supervisor and two project team assessors, who complete independent assessments. In assessing the report, performance under the following headings will be marked:

• presentation (structure, editing, spelling and grammar)

• extensive literature survey and background knowledge

• academic and technical achievements including quality and quantity of design, theory, analysis, software, construction and experimental work (as appropriate).

• judgement, innovation, originality, conciseness and clarity

• Appendix 1: Routes to Exploitation. All reports must contain a planned ’route to exploitation and commercialisation’ in-keeping with Research Council funding policies. The appendix must describe how the work could lead to improvements in a particular application and have an impact to society. The text in this section should be brief and should be able to be read by non-specialists.

Please do not use the above list as headings in your report. Please read the attached assessment sheet before writing the report and remember that the assessors are looking for evidence of **your** contribution to the project. The layout of the report should be clear, logical and concise, please consult your supervisor if in doubt. Considerable weight will be given to conciseness and clarity, and marks will be deducted for untidiness, illogical arrangement, vagueness, verbosity, irrelevance (do not insert pictures of PP3 batteries! ), incorrect English or poor spelling.

You are advised to examine a number of papers in professional journals and copies of PhD theses in the Main Library. You should also make use of the extensive online databases which are available through the University online library system. Please browse through IEEExplore, and the Web of Science. The report should contain:

• an abstract or executive summary

• a list of contents

• an introductory chapter or section outlining the aims of the project

• An extensive literature survey which should summarise any relevant published work in a suitably integrated manner and be embedded in the report

• Details about the design, analysis and testing

• a clear and concise discussion of the results

• the conclusions drawn from the results.

To avoid risking accusation of plagiarism, which is a serious offence, any material from another source quoted directly in your report must be enclosed in quotation marks and properly attributed, i.e. a reference given in the text and full reference details included in the reference list. It must be clearly identifiable as a quotation. The Harvard referencing system should be applied to all sources used in your work. Details are included within Appendix 1 of this document.

Heavy penalties, affecting degree class, have been applied in recent cases of inadequate attribution (referencing) of material. Conversely, a student who demonstrates that they are ’well read’ tends to be awarded high marks - provided they demonstrate a working system!

Figures, tables and graphs should be numbered and properly captioned. Make sure your graphs have units, labels, and are clear. Tables should have the correct number of significant figures. If you calculate a number in a simulation program and quote the result to a high number of significant figures - then you must justify the high level of certainty in your result. For example 345.527 V implies an accuracy of 1 mV. Perhaps 345.5 V would be better?

Generally, you should assume that the reader of your report is an engineer but has no specialised knowledge of the project topic. Jargon and ambiguous abbreviations must be avoided. Abbreviations must be spelt out on first appearance unless they are universally understood (e.g. spell out PWM but not DC). The reports must be pleasing to-the-eye and easy to read. Project reports must be typed on A4 paper, using at least 1.5-line spacing and a minimum font size of 11 points. Conciseness is important, so the length of the report, including diagrams and appendices but not program listings, must not exceed 100 pages. The most common mistake is to assume that there is any relationship between report length and mark awarded. Although additional material may be submitted on WebCTwith the report they will not form part of the assessment.Your report must be submitted to WebCT from where it will be printed by the School in back and white so please ensure all images will work in this format and do not rely on colour.

### 2.6 Handing in Instructions

MEng reports must be submitted electronically in PDF format to Canvas, technical information (coding, schematics etc) should also be submitted to Canvas at the same time. The School computers allow the user to select a pdf printer that automatically generates a suitable file. All reports will be subject to an electronic plagiarism search using a database of web-based resources and previous project reports. Log books must then be submitted before the published deadline to the Postgraduate Office with a completed Coursework Receipt Form.

### 2.7 Late Submission

Engineers normally have to work to stringent deadlines. Your final report must be submitted by 12 noon on the date described with the Project Calendar.

As with all other coursework, you can apply for an extension to the deadlines if you have documentary evidence of serious medical or other problems. Applications for extensions to deadlines must be submitted to the Postgraduate Office **before** the deadline and will be processed as quickly as possible. If you submit your report late without having had an approved extension to deadline, then penalties will be applied at the rate of 5% per day. If you believe that you have a valid reason for submitting late **and** for failing to submit an extension to deadline request before the deadline, then you must submit a Notification of Extenuating Circumstances and Fit to Sit form (available via my.bham.ac.uk and the Postgraduate Office) along with any supporting evidence (e.g. a medical certificate) which will be read by the Mitigations Committee, who will then decide whether a penalty is justified.

Delay arising from computing facilities will not normally be considered adequate excuse for late submission, as you are expected to allow time for such mishaps in your planning. **Loss of computer files is not an adequate reason; it is essential to make frequent backups and keep them safe.**

The final report accounts for 70% of the final project mark. It should be remembered that every year there are cases of very able students failing to reach their potential as a result of poorly written Final Reports - please do spend some time in the Main Library reading a selection of PhD theses.

### 2.8 Project Open Day

Project Open Day is on Thursday of the first week of the Summer Term. You will be required to discuss your project with the External Examiners, Industrialists, Parents, Staff and Undergraduate Students. An A1-sized poster should be prepared using one of the PowerPoint templates that will be emailed to you during the Easter vacation and available on WebCT. This must comply with published University guidelines for publicity material. The poster should facilitate a variable-length presentation (from seconds to minutes) to a passing audience. This component is assessed and is worth 1% of the final project mark (and possibly much more if an assessor is visiting you in order to help to understand your Final Report).

### 2.9 Assessment Culture

It is very important that all students consider their achievements from the view point of the assessors. Primarily, the assessors will be attempting to associate a mark with the breadth and depth of the perceived understanding of the project material displayed by the student. Generally, a project demonstrating a broad range of successful outcomes is viewed more positively than a project relying on a more limited range of outcomes. To help you, please look at the diagram shown in figure and think how your project deliverables relate to each area. You may interpret the words in a manner to suit your particular project. The central areas represent the core area of your project and you must demonstrate that you have made these achievements in your project report. The outer areas cover some of the techniques and tools that you have made. It is important that the methods you use in the project are scientifically robust and as a consequence you are likely to use several of the techniques identified in the outer area.

It is important that you can robustly defend any of the findings of your work. If, for example, you have done a detailed computer simulation of some physics based system, then some comparison with other work, or experimental results is vital. You should also think carefully about the method that you use for the comparison. A common question in bench inspections is “how have you validated your results?”

Two thirds of the marks allocated to your project will be awarded by a specialist team of very-experienced MEng assessors. They may have a different view as to what constitutes a reasonable set of tangible deliverables from that of your supervisor. This diagram is included in order that you may shape the direction of your project as it progresses.

### 2.10 MEng Grade Descriptors

Many of the assessments are based on grade descriptors that will be interpreted liberally by the assessors to suit the wide diversity of projects. The grade descriptors shown in table are published to staff.

 

Figure 1: Schematic of key techniques and achievements of your final year project

|  |  |  |
| --- | --- | --- |
| **Degree class** | **Mark band** | **Characteristics** |
| First class honours (1st) | 1+=>751-=70..74.99’ | ***Excellent***Considerable capacity for original thinking; outstanding capacity to analyze and synthesize; outstanding grasp of subject matter; extensive knowledge base. |
| Upper second class honours (2.i) | 2.i+=65..69.99’2.i-=60..64.99’ | ***Good***Good grasp of subject matter, some evidence of originality, critical capacity and analytical ability; good understanding of relevant issues; good familiarity with the literature. |
| Lower second class honours (2.ii) | 2.ii+=55..59.99’2.ii-=50..54.99’ | ***Satisfactory***Satisfactory understanding of the subject matter; ability to develop solutions to straightforward problems. |
| Third class honours (3rd)**= Fail at MEng** | 3+=45..49.99’3-=40..44.99’ | ***Marginal***Minimally acceptable familiarity with subject matter, critical and analytical skills. |
| Failure**= Bad Fail at MEng** | 35..39.99’ | ***Inadequate***Insufficient understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature. |
| Bad Fail | <35 | ***No Serious Attempt*** |
| Blank – No Show | 0 | ***No work submitted, or did not attend presentation*** |

Table 2: Grade descriptors

## 3 Appendices

## Harvard-Birmingham System

**1. About referencing**

Good referencing is an essential part of academic scholarship. It has three functions:

1. To acknowledge an intellectual debt to another author where you have drawn on ideas, words, facts, claims or other material from his or her work, either explicitly or implicitly;
2. To support specific facts or claims which you make in your text;
3. To enable the reader to find sources to which you have referred easily and quickly.

If you acknowledge your sources correctly, you will avoid plagiarism. University guidelines on the University website.

**2. About the Harvard System**

The Harvard System of referencing and bibliography has been adopted as the standard for the presentation of academic text at the University of Birmingham. It should be used in all your work unless your School or Department has instructed you otherwise.

Citations are used within the text whenever sources are referred to or directly quoted. A reference list including all sources consulted is provided at the end of the document.

**3. Citing references within the text**

**3.1 Referencing ideas**

Where the author’s family name falls naturally within the text, put the date of the publication in brackets after the family name.

Bloggs (1990) demonstrated the importance of suspended sediment in determining the pollution profile of rivers. However, Smith and Jones (1992) claim that additional factors such as channel hydraulics have been shown to be equally influential.

When referring to a source in passing, include the author’s family name and date in brackets. If you have multiple references, separate them with semi-colons and order them either alphabetically or chronologically:

These ideas have been pursued by other American scientists (Graf, 1994; Outcalt, 1996; Wolman & Brown, 1999).

For three or more authors use the first author’s family name followed by “et al.” or “and others”.

Where reference is being made to a specific part of a work, a page reference should be given, e.g. (Gregory, 1990, p.26). This applies particularly where you are making reference to a particular figure, diagram or table within a work.

**3.2 Primary and secondary sources**

You may wish to refer to an author’s idea, model or dataset but have not been able to read the actual chapter containing the information, but only another author’s discussion or report of it. Similarly you may refer to a primary source, e.g. an author’s letters or diary, or a government report, that you have only ‘read’ as cited or reproduced within another author’s text. In both cases you should acknowledge the use of a secondary source using the following format:

The model of Mitchell (1996) (cited in Parry and Carter, 2003, p.160) simulates the suppressing effects of sulphate aerosols on the magnitude of global warming.

In this example ideally you should list both the Parry and Cater (2003) and Mitchell sources in your reference list but many schools will accept the listing of the secondary source (i.e. Parry and Carter) only.

**3.3 Quoting words from published material**

When quoting words from published material, the quoted text must be enclosed in quotation marks. For example:

Harvey (1992, p.226), however, now questions the validity of quantitative geography, stating:‘…the so-called quantitative revolution has blinded many researchers to the truths they are supposedly seeking’

Lengthy quotations are indented and separated:

Harvey (1992, p.226), however, now questions the validity of quantitative geography, stating:

‘…the so-called quantitative revolution has blinded many researchers to the truths they are supposedly seeking: results are scorned if they are not liberally sprinkled with equations and formulae. The growing popularity of qualitative methods, however, is thankfully reversing this trend’.

Here, the use of three full stops (ellipsis) is used to indicate missing text.

**3.4 Citing authors of book chapters**

If the book in which the chapter appears is edited by a different author, you still need to cite the author of the chapter (see 4.3.2).

**3.5 Citing anonymous works**

When citing works with no identifiable author, cite the title of the work (see 4.3.4).

**3.6 Citing works of Corporate Authorship and Official Publications**

In situations where works have no named personal author use the issuing organisation as if it were the author (see 4.3.5).

**3.7 Prolific authors**

If you wish to cite an author who has published more than one item in the same year, use lower case letter to distinguish between them. E.g., Smith (1990a) is the first piece of Smith’s work referred to, Smith (1990b) the second and so on. The letters should also be included in the reference list.

**4. The Reference List**

A complete reference list or bibliography should be included at the end of any written work. A reference list includes all cited items only; whilst a bibliography includes all cited items and any other works consulted but not cited in your text. In either case, all cited sources must be included. Items are listed alphabetically by author’s family name, year (and letter if necessary). The name that is given in the reference list must be the same as the name used in the text. For each work listed, certain elements should be present:

**4.1 Books**

1. Name(s) of author(s)/editor(s)
2. Year of publication (in brackets)
3. Title of book **emboldened**
4. Edition, if not the first
5. Number of volumes, if more than one
6. Place of publication
7. Name of publisher

Parker, C.C. and Turley, R.V. (1986) **Information sources in science and technology: a practical guide to traditional and online use**. 2nd ed. London: Butterworths.

The date should be the original date of publication of the edition being cited, not the publication date of the first edition or the date of the most recent reprinting. Other elements may be appropriate, such as the sub-title of a book, or a volume number and series title if the book is issued as part of a series. Conceivably (in a full bibliography, for example), the international standard book number (ISBN) might also be included.

**4.2 Periodical (i.e. journal) articles**

1. Names(s) of author(s)
2. (Date)
3. Title of article
4. Title of periodical **emboldened**
5. Volume number
6. Part number (if used by the journal) in brackets
7. Page numbers

Broida, T.J. and Chellappa, R. (1991) Estimating the kinematics and structure of a rigid object from a sequence of monocular images. **IEEE Transactions on Pattern Analysis and Machine Intelligence**, 13 (6): 497-513

**4.3 Particular types of references**

**4.3.1 Works of personal authorship**

Personal authorship is where the work is authored either by a single individual or two or more authors in collaboration. The first author’s name is always presented in inverse order with surname preceding forenames or initials. Subsequent names are also inverted.

**a. Works by a single personal author**

These require the essential elements for works given above:

Williams, J.G. (1991) **The bible, violence and the sacred: liberation from the myth of sanctioned violence**. San Francisco: Harper.

**b. Works by two personal authors**

In a joint-authored work list both of the authors:

Heymann, H.G. and Bloom, R. (1990) **Opportunity cost in finance and accounting**. New York: Quorum.

**c. Works by more than three authors**

The abbreviation “et al” or “and others” can be used. For example, in a work authored by six authors the first three should be named followed by et al:

Herron, C.M., Mirkov, T.E. and Solis-Gracia, N. et al. (2005) Severity of Citrus tristeza virus isolates from Texas. **Plant Disease**, 89 (6): 575-580

**4.3.2 Works produced under editorial direction**

These are items produced under the general editorial control of one or more editors. Individual chapters, however, may each be written by different authors. The abbreviation (ed.) or (eds.) is used to denote an edited collection:

Seidman, S. and Wagner, D.G. (eds.) (1992) Postmodernism and social theory: the debate over general theory. Cambridge (MA): Blackwell.

**4.3.3 Parts of books**

If you wish to refer to a chapter in a book or a particular part of a publication, construction of the reference will depend on whether or not the author of the chapter or part is also responsible for the whole book.

**a. Author of the chapter is also the editor of the book**

Parrot, B. (1990) The dynamics of Soviet defense policy. Washington DC: Wilson Center Press. pp.7-40

**b. Author of the chapter is not the editor of the book**

1. Name(s) of author(s)
2. Year of publication (in brackets)
3. Title of chapter (in speech marks) In
4. Author or editor of book
5. Title of book **emboldened**
6. Edition, if not the first
7. Number of volumes, if multi-volumed work/series
8. Place of publication
9. Name of publisher
10. Page numbers

Lake, D. (1991) “British and American hegemony compared: lessons for the current era of decline.” In Fry, M.G. (ed.) **History, the White House and the Kremlin**. London: Pinter. pp.106-122

Here it is clear that the chapter by Lake in an edited collection by Fry has been drawn upon specifically, rather than the book as a whole.

**4.3.4 Anonymous and pseudonymous works**

Truly anonymous works have no identifiable or ascertainable author. These should be listed by title first.

**Dod’s parliamentary companion**. (1992) 173rd ed. Etchingham: Dod’s Parliamentary Companion Ltd.

In the alphabetical list of references, file such items by the first significant word of the title, omitting definite and indefinite articles (such as ‘the’).

Where the author is ascertainable, but not given in the item, the real name can be given in parentheses:

(Horsley, S.) (1796) **On the prosodies of the Greek and Latin languages**.

Pseudonymous works should be listed under the pseudonym if that is how the author is primarily known. However, the real name may be supplied in square brackets after the pseudonym for less well-known pseudonymous authors:

Stendahl [Marie Henri Beyle]. (1925) **The charterhouse of Parma**. Translated by Scott-Moncrieff, C.K., New York: Boni and Liveright.

**4.3.5 Works of corporate (organisational) authorship**

These items have no named personal author, but are issued by a professional body, society, government department or other similar corporate body. In such cases the organisation is named as if it were the author:

Swedish Trade Council. (1991) **Swedish export directory**. 72nd ed. Stockholm: Swedish Trade Council.

British Medical Association. (1981) **The handbook of medical ethics**. London: BMA.

Where a list of references includes items published by government departments of more than one country it is advisable to enter the name of the country of origin before the name of the department. This collects such items and makes location and identification of them simpler:

Great Britain. Home Office. (1981) **Direct broadcasting by satellite: report of a Home Office study**. London: HMSO.

United States. Atomic Energy Commission. (1958) **Progress in peaceful uses of atomic energy, July-December, 1957**. Washington: US Government Printing Office.

**4.3.6 Multi-volume works**

For multi-volume works always enter the number of volumes after the general title:

Clarendon, Edward Hyde, Earl of. (1958) **The history of the rebellion and civil wars begun in England in the year 1641**. 6 vols., W.Dunn Macray (ed.). Oxford: Clarendon Press.

Where an individual volume within a multi-volume work is your main source enter the volume number and individual volume title after the general title:

Wright, S. (1978) **Evolution and the genetics of populations. Vol.4, Variability within and among natural populations**. Chicago: University of Chicago Press.

**4.3.7 Unpublished works**

Research may involve consulting materials which have not been published. Use the word “unpublished” only if appropriate. In many cases it is unnecessary. For an unpublished thesis or dissertation use the style:

Wild, M.T. (1972) **An historical geography of the West Yorkshire textile industries to C**.1850. PhD thesis, University of Birmingham.

For material which is soon to be published, but is ‘in press’ at the time of your writing give as much detail as you can:

Kouvatsos, D. (in press) (1993) **Maximum entropy analysis of queuing systems and networks**. Oxford: Blackwell.

Personal conversations, letters or interviews etc are often cited only in the text. If entered in the references use the style:

Smith, J. (2004) **Personal communication**.

Fuller information can be given if available:

Smith, J. (10 July 1999). **Interview with author**. Boston, Massachusetts.

You may also wish to indicate the status of Smith if that is relevant, e.g. Chief Executive of a major manufacturing company.

**4.3.8 Papers in conference proceedings**

For papers cited from the proceedings of a conference there are two possibilities. The sponsoring organisation may be treated as an author:

Institution of Electronic and Radio Engineers. (1970) **Proceedings of the joint conference on automatic test systems. Birmingham, 13-17 April 1970**. London: I.E.R.E (I.E.R.E Conference proceedings; 17)

Or the conference may be entered under its title:

**Fourth world congress of anaesthesiologists. London, 9-13 September 1968** (1969) Amsterdam; London: Excerpta Media Foundation. (International Congress Series; 168)

**4.3.9 Videos, films or broadcasts**

1. Title
2. Year (for films, the preferred date is the year of release in the country of production)
3. Format of the material
4. Director if ascertainable
5. Production details (place and organisation).

**The amazing newborn**. (1977) Film. Consultant: Marshall H. Klaus. USA.

**Programmes and series**

Number and title of an episode should be given, series title and transmitting organisation and channel and date and time of transmission.

**Holby City** (1999) Episode 7, Take me with you. TV, BBC1. 1999 23 Feb.

**Contributions**

Items within a programme should be cited as contributors.

Blair, T. (1997) Interview. In: **Six o’clock news**. TV, BBC1. 1997 Feb 29. 1823hrs.

**4.3.10 Referencing electronic sources**

Electronic sources of information are becoming increasingly important in academic work, but as yet a fixed standard for referencing these does not exist. A good guideline is to emulate the style for printed material as far as possible and to include as much information as possible.

**a. Individual electronic works**

In citing an electronic work such as a webpage, elements include author's/editor's surname and initials, year of publication, title, the word online in square brackets, edition details, place of publication, publisher (if ascertainable).
The web address and the date the page was accessed should also be included:

Environment Agency (1999) **Nitrate vulnerable zones** [online]. [www.environment-agency.gov.uk/modules/MOD43.7.html](http://www.environment-agency.gov.uk/modules/MOD43.7.html) [Accessed September 1st 1999]

**b. E-journals**

If you are referencing an electronic version of a journal article which also exists in print, reference the article as you would if it were the print version, using the page numbers taken from the on-screen article (see section 4.2). A reference to an article from an ‘electronic only’ journal should include author's/editor's surname and initials, year, title, journal title (followed by [online]) and volume and issue details.

Bailey, S. (2005). Assessing the Impact of the Freedom of Information Act on the FE and HE Sectors. **Ariadne** [online], 42. Available from: www.ariadne.ac.uk/issue42/bailey/ [Accessed 20 June 2005].

If the document does not include pagination or an equivalent internal referencing system, the extent of the item may be indicated in terms such as the total number of lines, screens, etc., e.g. "[35 lines]" or "[approx. 12 screens]".

**c. Personal electronic communication (e-mail)**

When referencing personal e-mail messages, give the sender as the author followed by their email address, identify the full date and use the subject line as the title of the work. Identify the recipient of the message and their email address.

Smith, J. (j.smith@bham.ac.uk), (4 April 2005). **Re: How to format bibliographies**. e-mail to T. Jones (t.jones@bham.ac.uk).

**d. CD-ROMs and DVDs**

For CDs and DVDs which are works in their own right (and not bibliographic databases), list the author’s family name and initials, year, title, medium (CD or DVD), place of publication (if known) and the publisher.

Hawking, S.W. (1994) **A brief history of time: an interactive adventure**. [CD-ROM]. Crunch Media.

If submitting a manuscript for publication, formatting conventions may be stipulated by the publisher or in the instructions to authors for a particular periodical. You should consult and study these ‘instructions for authors’ if you are considering submission. These normally appear inside the front or back covers of single periodical issues. The most important principle regarding formatting is consistency – adopt the same practices throughout.

In selecting information for each part of the reference quote from the title page and other preliminaries of the book or article. Generally capitalisation and punctuation can be changed (as long as you are consistent) but the author’s original spelling on the title page should be observed.

**5. Good Practice**

Noting your references as you work is imperative if you are to use your time efficiently. As you make notes or photocopy material note the full reference details. This will prevent you from relying on memory or having to find your source again when you come to write your bibliography/reference list.

Acknowledging your sources correctly is time-consuming but essential, so leave plenty of time for this important activity.

**6. Reference Management Software**

Packages such as EndNote and Reference Manager allow you to create a ‘database’ of references and then output them in a consistent style, such as Harvard (please ensure that you check the style you use to format your references before submission). They also integrate with work processing software so that you can ‘cite as you write’. These packages can be found on a variety of school and student cluster computers. More information can be found at [www.i-cite.bham.ac.uk](http://www.i-cite.bham.ac.uk)

**7. Further Reading**

No guide can hope to instruct you in every conceivable possibility when referencing your sources. By applying these guidelines and by using your own judgement (bearing in mind the need to give enough information for interested readers to locate an item) you should be able to construct a proper reference for any item which you have consulted.

The following works provide detailed recommendations for using the Harvard system of referencing: British Standards Institution. (1990) **Recommendations for citing and referencing published material**. London: BSI (BS 5605). British Standards are available at [www.elibrary.bham.ac.uk](http://www.elibrary.bham.ac.uk).

**The Chicago manual of style: for authors, editors and copywriters**. (1993). 14th ed. Chicago: University of Chicago Press.

Gibaldi, J. (1998) **MLA style manual and guide to scholarly publishing**. 2nd ed. New York: Modern Language Association of America.

University of Illinois at Urbana-Champaign College of Liberal Arts and Sciences (2005) **The writer’s workshop** [online]. Available from: [www.english.uiuc.edu/cws/wworkshop/writer\_resources/citation\_styles/citation\_styles.htm](http://www.english.uiuc.edu/cws/wworkshop/writer_resources/citation_styles/citation_styles.htm) [Accessed 11 July 2006]

 SK04/JH 04/09/06



## MEng Final Year Research Project - First Report Assessment

|  |  |  |  |
| --- | --- | --- | --- |
| **Student Name:** |  | **Supervisor:** |  |

To be filled in by the supervisor. (Staff are to interpret the suggested criteria liberally – to match the particular project)

|  |  |
| --- | --- |
|  | Mark (100%) |
| **Knowledge and Understanding (15% weighting)** | (0-100) |
| The heading ‘Knowledge and Understanding’ will be suitably interpreted by the assessor. |
| This section may include: Identification, classification & description of required engineering system [student understands requirement?] (10%) Social, environmental & legal impacts. Requirement for safe & moral operation [risk assessment, contingency, etc] (5%) |
| **Subject Specific Cognitive & Intellectual Skills (35% weighting)** | (0-100) |
| The heading ‘Subject Specific Cognitive & Intellectual Skills’ will be suitably interpreted by the assessor. |
| This section may include: Creation of new processes or products through synthesis of ideas from a wide range of sources [literature survey, etc] (20%). Use of scientific [formal] principles in the modelling and analysis of engineering systems, processes and products [e.g. annexes for analytical calculations & structured designs] (15%) |
| **Transferable and Key Skills (30% weighting)** | (0-100) |
| The heading ‘Transferable & Key Skills’ will be suitably interpreted by the assessor. |
| This section may include: Communicating effectively with clients, colleagues & public [structure of report, spelling, grammar, etc] (10%). Identify professional, technical & personal development needs and undertake appropriate training & independent research [e.g. demonstrated competence in new programming languages, etc] (20%) |
| **Subject Specific Practical Skills (20% weighting)** | (0-100) |
| The heading ‘Subject Specific Practical Skills’ will be suitably interpreted by the assessor. |
| This section may include: Anything tangible generated to demonstrate a concept. Management of project, people, resources and time [e.g. working relationship with supervisor, time-management, etc] (20%) |

**Please copy this form and give to the student when you are discussing their report with them, and then return the original to PG office by Friday week 4.**

|  |
| --- |
| Feedback to student : Please ensure that these comments convey useful information to the student, independent arbiter and external examiner.**SPECIMEN** |



## MEng Final Year Research Project – Technical Presentation Assessment

Student name: Supervisor: Room: Time: Assessor:

To be filled in by the supervisor. (Staff are to interpret the suggested criteria liberally – to match the particular project)

|  |  |
| --- | --- |
|  | Mark (100%) |
| **Knowledge and Understanding (15% weighting)** | (0-100) |
| The heading ‘Knowledge and Understanding’ will be suitably interpreted by the assessor. |
| This section may include: Identification, classification & description of required engineering system [student understands requirement?] (10%). Requirement for safe & moral operation [risk assessment, contingency, etc] (5%) |
| **Subject Specific Cognitive & Intellectual Skills (30% weighting)** | (0-100) |
| The heading ‘Subject Specific Cognitive & Intellectual Skills’ will be suitably interpreted by the assessor. |
| This section may include: Creation of new processes or products through synthesis of ideas from a wide range of sources [literature survey, etc] (20%). Use of scientific [formal] principles in the modelling and analysis of engineering systems, processes and products [e.g. annexes for analytical calculations & structured designs] (15%) |
| **Transferable and Key Skills (30% weighting)** | (0-100) |
| The heading ‘Transferable & Key Skills’ will be suitably interpreted by the assessor. |
| This section may include: Communicating effectively with clients, colleagues & public [structure of report, spelling, grammar, etc] (10%). Identify professional, technical & personal development needs and undertake appropriate training & independent research [e.g. demonstrated competence in new programming languages, etc] (20%) |
| **Subject Specific Practical Skills (25% weighting)** | (0-100) |
| The heading ‘Subject Specific Practical Skills’ will be suitably interpreted by the assessor. |
| This section may include: Anything tangible generated to demonstrate a concept. Management of project, people, resources and time [e.g. working relationship with supervisor, time-management, etc] (20%) |

**Please return to the PG office immediately.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Feedback to student : Please ensure that these comments convey useful information to the student so that they may improve their future work. The form may also be read by the independent arbiter and external examiner.**SPECIMEN**

|  |  |  |  |
| --- | --- | --- | --- |
| Logbook present: |  | CV present: |  |

 |



## MEng Final Year Research Project - Second Report Assessment

Student name: Supervisor:

To be filled in by the supervisor. (Staff are to interpret the suggested criteria liberally – to match the particular project)

|  |  |
| --- | --- |
|  | Mark (100%) |
| **Knowledge and Understanding (10% weighting)**This section may include: Identification, classification & description of required engineering system [student understands requirement?] (10%). | (0-100) |
| **Subject Specific Cognitive & Intellectual Skills (40% weighting)**This section may include: Creation of new processes or products through synthesis of ideas from a wide range of sources [extensive literature survey using scientific journals, etc] (20%). Use of scientific [formal] principles in the modelling and analysis of engineering systems, processes and products [e.g. annexes for analytical calculations & structured designs] (20%). | (0-100) |
| **Transferable and Key Skills (40% weighting)**This section may include: Communicating effectively with clients, colleagues & public [structure of report, spelling, grammar, etc] (10%). Identify professional, technical & personal development needs and undertake appropriate training & independent research [e.g. evidence of competence in new programming languages, practical implementation, tangible deliverables, etc] (20%). Working with limited or contradictory information [e.g. student has be able to cope with deficiencies in the specification, available data, etc] (10%). | (0-100) |
| **Subject Specific Practical Skills (10% weighting)** | (0-100) |
| This section may include: Manage projects, people, resources and time [e.g. working relationship with supervisor, time-management, etc] (10%) |

**Please copy this form and give to the student when you are discussing their report with them, and then return the original to PG office by Friday week 2.**

|  |
| --- |
| Feedback to student: Please ensure that these comments convey useful information to the student, independent arbiter and external examiner.**SPECIMEN** |



## MEng Final Year Research Project – Bench Inspection Assessment

Student name: Supervisor: Assessor:

To be filled in by the supervisor. (Staff are to interpret the suggested criteria liberally – to match the particular project)

|  |  |
| --- | --- |
|  | Mark (100%) |
| **Knowledge and Understanding (15% weighting)** | (0-100) |
| The heading ‘Knowledge and Understanding’ will be suitably interpreted by the assessor. |
| This section may include: Science appropriate to the specific discipline [understanding of fundamental principles?] (10%) General principles of design [e.g. formalised approach to project, etc] (5%) |
| **Subject Specific Cognitive & Intellectual Skills (30% weighting)** | (0-100) |
| The heading ‘Subject Specific Cognitive & Intellectual Skills’ will be suitably interpreted by the assessor. |
| Creation of new processes or products through synthesis of ideas from a wide range of sources. [literature knowledge, etc] (10%) Ability to produce solutions to problems through application of engineering knowledge & understanding [deliverables] (10%) Use of scientific [formal] principles in the modelling and analysis of engineering systems, processes and products (10%) |
| **Transferable and Key Skills (25% weighting)** | (0-100) |
| The heading ‘Transferable & Key Skills’ will be suitably interpreted by the assessor. |
| Communicating effectively with clients, colleagues & public [presentation skills, visual aids, engage assessors, etc] (20%) Use of creativity and innovation in problem solving [novel solutions, etc] (5%) |
| **Subject Specific Practical Skills (30% weighting)** | (0-100) |
| The heading ‘Subject Specific Practical Skills’ will be suitably interpreted by the assessor. |
| Documentation showing ability to manage projects, people, resources and time [logbook, etc] (10%) Design of system component or process [e.g. tangible deliverables] (10%) Practical testing of design ideas in laboratory (or simulation), technical analysis & critical evaluation of results (10%) |

**Please return to the PG office immediately.**

|  |
| --- |
| Feedback to student: Please ensure that these comments convey useful feedback to the student, where appropriate include guidance on their final report. The form may also be read by the independent arbiter and external examiner.**SPECIMEN** |



## MEng Final Year Research Project - Supervisor’s Report Form

Student name: Supervisor:

To be filled in by the supervisor. (Staff are to interpret the suggested criteria liberally – to match the particular project)

|  |  |
| --- | --- |
|  | Mark (100%) |
| Record Keeping [log book and other documentation] (5%) | (0-100) |
| Intellectual Input & Initiative – some knowledge and understanding will be at forefront of discipline (25%) | (0-100) |
| Ability to work independently, ability to make sound judgements in the absence of complete information (10%) | (0-100) |
| Communication Skills [spoken, listening and written] (10%) | (0-100) |
|  |
| Organisation and Planning [time management, contingency, progress monitoring] (10%) | (0-100) |
| Comprehension of Project – application of specialist skills in a professional capacity (10%) | (0-100) |
| Commitment – self-motivated (10%) | (0-100) |
| Tangible Deliverables – demonstration of their technical, intellectual and transferable skills (20%) | (0-100) |

|  |
| --- |
| Comments : Please note any special factors that should be taken into account and any general points you would like to make, particularly with regard to the level of student input to the project, problems outside the student’s control, extent of help required, etc.**SPECIMEN** |

Notes:

Much of the study undertaken at MEng level will have been at, or informed by, the forefront of an academic or professional discipline. Students will have shown originality in the application of knowledge, and they will understand how the boundaries of knowledge are advanced through research. They will be able to deal with complex issues both systematically and creatively, and they will show originality in tackling and solving problems. They will have the qualities needed for employment in circumstances requiring sound judgment, personal responsibility and initiative in complex and unpredictable professional environments



## MEng Final Year Research Project - Final Report Assessment

|  |  |
| --- | --- |
| Student Name: Supervisor:  |  |

**To be filled in independently by the supervisor and each of the assessors.**

|  |  |
| --- | --- |
| **Knowledge and Understanding** | **Mark (100%)**  |
| Identification, classification & description of required system. [student understands global requirement?] (10%); Social, environmental & legal impacts. Requirement for safe & moral operation. (5%); Resolution of difficulties created by imperfect and incomplete information. (10%); Science appropriate to the specific discipline. [understanding of fundamental principles?] (60%); General principles of design [formalised approach to project, etc] (15%). (weight of this section = 0.15) | (0-100) |
| **Subject Specific Cognitive & Intellectual Skills** |  |
| Creation of new processes or products through synthesis of ideas from a wide range of sources. [literature survey, skill shown in selecting information, validating it and applying it in the context of the overall objective and constraints, etc] (30%); Use of scientific [formal] principles in the modelling and analysis of engineering systems, processes and products [academic and technical achievements in analysis and design] (30%); Ability to produce solutions to problems through application of engineering knowledge & understanding [design deliverables] (40%). (weight of this section = 0.35)  | (0-100) |
| **Transferable and Key Skills** |  |
| Communicating effectively with clients, colleagues & public [structure of report, spelling, grammar, etc] (60%); Use of creativity and innovation in problem solving [novel solutions, originality & initiative, etc] (20%). Appendix 1: Routes to Exploitation (20%). (weight of this section = 0.15)  | (0-100) |
| **Subject Specific Practical Skills** |  |
| Manage projects, people, resources and time [evidence of working relationship with supervisor, resolution of conflicts, time-management, etc] (15%); Design of system component or process. [tangible deliverables, working system, etc] (50%); Practical testing of design ideas in laboratory (or simulation), technical analysis & critical evaluation of results (35%). (weight of this section = 0.35) | (0-100) |

**Please return this form to the Postgraduate Office immediately after completion.**

|  |
| --- |
| Comments : Please ensure that these comments convey useful information to the independent arbiter and external examiner.**SPECIMEN** |

Notes:

* The marks for each section should be returned out of 100% - the weighting values are included for information only.
* Any mark above 75% should be accompanied by a suitable explanation.
* All reports **must** be accompanied by detailed and useful comments.

**Much of the study undertaken at MEng level will have been at, or informed by, the forefront of an academic or professional discipline. Students will have shown originality in the application of knowledge, and they will understand how the boundaries of knowledge are advanced through research. They will be able to deal with complex issues both systematically and creatively, and they will show originality in tackling and solving problems. They will have the qualities needed for employment in circumstances requiring sound judgment, personal responsibility and initiative in complex and unpredictable professional environment.**



# Ethical review of student projects.

For most student research projects, taking place within the School ethical behavior is a matter of adhering to professional practice standards with regard to plagiarism and honest reporting of results and data. However in some cases the details of the project and methods involved will require Ethical review. This includes research where humans are the participants of the research, either directly, to provide information on user requirements or in the evaluation of software and devices developed as part of the project. Ethical review must take place before the start of any substantive research (including pilot studies, but excluding literature review). **In order to identify these cases all students should complete the General Ethics Questionnaire in consultation with their supervisor.** **This must be submitted by your supervisor together with your first Project Report**. Following submission of this form, you and your supervisor will be notified whether or not you need to complete the Full Ethical Review Form and this information will also be given to your assessors.

If you answer **NO** to **all** the questions in the form, further ethical review is not necessary. If you have answered **YES** to **any** of the questions, you need to complete a Full Ethical Review Form and submit it for review before the beginning the relevant part of your research. If, having answered YES to **any** of the questions, you do not apply for ethical review, it will not be possible for the affected parts of your project to be given a mark. **The final deadline for submitting this form is with the second Report.** Forms submitted after this date will not be reviewed. The form is available in the “Ethics for Student Projects” folder in the student section of WebCT. **The form should be submitted via WebCT and an email sent to** **eece-ethics@bham.ac.uk** **in order to notify the ethics committee that you have made a submission.** Failure to submit the email may mean that ethical approval your project may be delayed.

# Research involving human participants.

If you need to complete the Full Ethical Review Form, you will need to consider the following:

1. Human participants. Why will you use human participants and who will you use? How will you recruit the participants.
2. Methods. What methods will you use and what role will the participants play? Will they evaluate software or a device that you have developed or will you be investigating some aspect of human behaviour or performance.
3. Consent. In general, research involving human participants will require informed consent. The investigator will need to provide them in writing with a *Participant Information Sheet*. This will describe the purpose of the research, the methods involved, how the participants will be involved and what will happen to the results, including whether it is expected that a publication will result. They will also need to obtain their consent in writing using a *Consent Form* of which the participant and the investigator must both have a signed copy. Guidance on the format of these is included with the Full Ethical Review Form.
4. Participant Feedback. Informed consent involves the participants knowing the full details of the purpose of the research and about its results. The availability of feedback may simply consist of the participants being able to contact the investigator to ask about the results.
5. Participant Withdrawal. Informed consent involves participants being able to withdraw from the project and withdraw their data. The date by which they must ask for their data to be withdrawn must be stated. This will normally be the submission date of the project report.
6. Confidentiality.In general it is a requirement that participants cannot be identified in a report or publication. Sometimes this is achieved by assigning each participants a unique identifier code which is used to identity their data. In this case the data is treated as confidential and the list of codes must be kept separately. In other cases, no such list will be maintained, so that the participants can never be identified in the dataset and are thus anonymous.
7. Storage, access and disposal of data. Data must be stored on University servers, not on the investigator’s personal computer. It must be stored at least until you have graduated from the University, however, if you wish the data to be published in a journal or otherwise, it must be kept by your supervisor for up to 10 years from the date of publication, in accordance with University Regulations.
8. Risks. This would include physical or psychological risks associated with software or devices developed as a result of the project. All projects must have a separate risk assessment before work starts.

**School of Electronic, Electrical and Computer Engineering**

**UNIVERSITY OF BIRMINGHAM**

**GENERAL ETHICAL QUESTIONAIRE FOR All STUDENTS**

|  |  |  |
| --- | --- | --- |
| **Name of student** |  |  |
| **Email address of student** |  |  |
| **Name of supervisor** |  |  |

|  |  |
| --- | --- |
| **Title of Research Project**: |  |

|  |  |
| --- | --- |
| **Will the research project involve humans as participants of the research** (with or without their knowledge or consent at the time)? This will include any survey, interview or questionnaire that human participants may be asked to complete at any stage as the main part of the project or in the evaluation of the results/deliverables of the project. It will also include any testing of devices, software and other deliverables, which may arise as a result of a project and involves human participants other than the student undertaking the project. Analysis of images or other recordings of human participants or their property and personal possessions is also included. | YESNo |
| **Are the results of the research project likely to expose any person to physical or psychological harm**? (Note, before starting the project you will need to complete a risk assessment in all cases) | YesNo |
| **Will you have access to personal information that allows you to identify individuals, or to corporate or company confidential information** (that is not covered by confidentiality terms within an agreement or by a separate confidentiality agreement)? | YesNo |
| **Does the research project present a significant risk to the environment or society**? | YesNo |
| **Are there any ethical issues raised by this research project that in the opinion of your supervisor require further ethical review**? | YesNo |

If you answer **NO** to **all** the above questions, further ethical review is not necessary. You should have this form available at the bench inspections and include it in your final report.

If you have answered **YES** to **any** of the questions, you need to complete a full ethical review form and submit it for review before the beginning the relevant part of your research. If you do not apply for ethical review, it will not be possible for the affected parts of your project to be given a mark. The final deadline for submitting this form is with the second report. Forms submitted after this date will not be reviewed.

1. University Health and Safety Regulations forbid the presence or consumption of food and drink within laboratories. If you fail to observe this rule, you will be asked to leave the laboratory [↑](#footnote-ref-1)