



Department of Electrical and Computer Engineering

ELECTENG/COMPSYS/SOFTENG700A/B Research Project

Handbook

Purpose

The Part IV Research Project is a major undertaking for both students and staff. This handbook describes in detail the regulations you must follow, and the guidelines you should follow, in order to comply with the requirements of this paper.

Staff will assume that you are completely familiar with the contents of this document, together with the companion document Project Planner. Please read both documents before starting work on your project activity. If you have any questions relating to this document, please contact your supervisor.

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1. Nature and Scope of Projects

The Part IV Research Project is a learning exercise in which the student tackles a significant problem requiring independent thought and action in a situation not too different from many that might be encountered in subsequent professional life. In most cases students will work in groups of two under the direction and continuing guidance of a project supervisor. A second supervisor will be assigned as well to each group to monitor progress. Assessment will be on an individual basis throughout the project. Usually areas of individual responsibility will need to be identified.

Work on the project commences by mid-March and continues to the mid-September, with the expectation that students will spend on average about 10 hours per week on their project throughout. In contrast to other courses in the degree, the Part IV Research Project carries a weight of thirty points.

The student will need to draw upon a good level of theoretical knowledge and skills acquired so far in the degree and extend these in many respects. A survey of the field in which the problem lies and of alternative approaches to the problem will precede detailed work on a solution. The problem may require the design of equipment to carry out some specific task; it may be experimental in the sense of investigating phenomena or the behaviour of complex equipment; it may require the computer analysis and simulation of an engineering system; it may require a software solution; or it may involve elements of all four of the preceding activities. In each case the proposed solution should be thoroughly tested and evaluated to determine its adequacy.

A professional report that adequately covers all aspects of the investigation is a key objective of the project and will be assessed accordingly. Individual reports will be required. In addition, students will be required to give an exhibition of their work, as well as a formal seminar to staff and students.

Project assessment is broken down into the five components shown in Table 1.1.

Table 1.1: Project components

Interim Report
Project implementation
Seminar
Exhibition
Final Report

Apart from the interim report, the remaining components are assessed at the end of the project. Students will be assessed individually for each component.

The two report components, together with the seminar and exhibition, are intended to assess the student's ability to communicate to others and understanding of the project as a whole, as well as give a detailed account for the work undertaken. Collectively they comprise **70%** of the final grade, with each being assessed by at least two members of the academic staff.

The implementation component, which constitutes the remaining **30%** of the final grade and is awarded at the end of the project, is intended to assess the degree of application of the student to the project and the quality of work undertaken. The project supervisor and the second supervisor award this grade jointly.

2. Formal Requirements of courses ELECTENG/COMPSYS/SOFTENG 700A/B

Students are expected to work consistently on their project throughout the year. They are required to submit both an interim and a final report, deliver a seminar on their project, provide a demonstration of their project during the Exhibition Day, and obtain a passing grade overall.

Please note that **ALL** students who enroll in Project will be assessed in each of the components as each of them is measuring a different aspect of the Project work. Students who do not fulfill this requirement will not pass. With the strict timetable constraints, no extensions will be possible for the Reports, apart from extensions according to the standard University Aegrotat/Compassionate pass regulations. In such a case, the Report(s) would still need to be submitted after the deadline and would be assessed according to the University Aegrotat/Compassionate Pass Regulations and our standard assessment criteria. With regard to the Seminar and Exhibition, the University Aegrotat/Compassionate Pass Regulations also apply, but their assessment would be made at a resit Seminar and/or Exhibition. It will not be possible to give substitute grades for the Seminar and/or Exhibition based on previously submitted work – these components are a compulsory part of the course for every student enrolled and must be attempted.

Note: To obtain a pass in the papers ELECTENG700A/B, COMPSYS700A/B or SOFTENG700A/B, students must gain both a passing mark in implementation and a passing mark overall.

Students who fail Interim Report and/or Interim Implementation will be interviewed. The interview will be conducted by both the Project Coordinator and HoD.

Each project member must undertake a peer assessment of the other member. The peer assessment marks submitted by individuals will remain strictly confidential.

The various components of the project are explained in detail below.

2.1 Interim Report

The purpose of the interim report is to present an overview of the project and to report on progress to-date. The intended readership is any person knowledgeable in Electrical/Computer Systems/Software Engineering, but not necessarily a specialist in the particular subject area.

The general form of the interim report should be as for the final report (see Appendix A). The reports will be conference style papers with 3-5 pages written in a double column format. The grading of the interim report will be largely on the same basis as for the final report (see Appendix C).

It is recommended that students consult their supervisors concerning the organisation and content of their report. However, supervisors are NOT permitted to read or comment on drafts of the report prior to submission. It is permissible for the supervisors to comment on the table of contents of the interim report.

The Interim Report must be submitted online.

2.2 Final Report and compendium

The culmination of the project is the presentation of a report of an appropriate form and standard. Its principal aim is to give a complete coverage of the project, the intended readership being any person knowledgeable in Electrical/Computer Systems/Software Engineering, but not necessarily a specialist in the particular subject area. All relevant material from the interim report should be included.

The reports will be conference style papers with 6-10 pages written in a double column format. Additionally, the students will submit technical compendiums to their supervisors, which may be in free format. The compendium should contain all the details of the projects including any software code.

Each member of a project group must submit individual reports and reports must be complete in themselves. This may involve the duplication of results or information in related reports as well as descriptions of work undertaken by another group member. Where work reported has not been carried out by the particular author, this must be acknowledged.

Appendices A and B contain a comprehensive set of guidelines for report writing. The basis of assessment for the final report is detailed in Appendix C.

Students are strongly encouraged to read these appendices.

The supervisor cannot provide help preparing the final report, except to comments on the general structure of the report, and comment on the table of contents.

2.3 Seminar

2.3.1 Presentation

The seminar is an oral presentation of the final report, the audience typically being members of staff and fellow students. Each group will be allocated a period of ten minutes per student, plus ten minutes for discussion and questions, and the seminar must be organised with students speaking only once, in turn.

The first speaker should make it a priority to establish clearly, for what effectively will be a lay audience, the nature of the problem tackled. The overall nature of the solution, (or the reasons why no solution was possible), should then be presented, with more detailed discussion of the work being left to the next speaker.

The allocation of areas for discussion needs to be fully agreed beforehand and the group is

strongly advised to rehearse their presentation. They should avoid reading from a prepared text, or writing on the board during their presentation, except perhaps to answer questions from the audience. Instead, prepared diagrams and other visual aids are recommended.

The seminar programme comprises a number of sessions each chaired by a member of staff, with a panel of staff and student peers to assess the presentations.

Note Students are required to report to the Session Chair ten minutes before the beginning of the session in which they are to deliver their seminar, and are required to attend the entire session. Failure to comply with this regulation will result in penalties being applied (see Section 5.2). The basis of assessment for the seminar is detailed in Appendix C.

2.3.2 Assessing Other Students' Seminars

Students enrolled in ELECTENG/COMPSYS/SOFTENG700A/B are part of the seminar assessment team and are required to attend another seminar session to grade the performance of fellow students. The grades may be combined equally with those returned from the academic staff. Students will be obligated to attend particular seminars and details will be circulated prior to Project Week.

Failure to comply with this regulation will result in penalties being applied (see Section 5.2).

2.4 Exhibition

In addition to the seminar, each project group will be required to give an exhibition of their project, the format of which should be similar to that given at a trade show. As such, the exhibition is intended to be somewhat less formal than the seminar, and on an interactive basis. Both members of the project group must participate. The time allowed per group will be 15 minutes. It is recommended that each student speak for a total of 5 minutes, leaving 5 minutes for questions.

There should be an emphasis on concepts, rather than detail. The particular format adopted should be discussed beforehand with the project supervisor but is at the discretion of the group. However, the quality of presentation should be high, with effective use being made of posters, as well as hardware and software simulations. The audience will be a small panel drawn from members of the academic staff and will not include the project supervisor. The basis for assessment of the exhibition is detailed in Appendix C.

2.5 Implementation

The implementation component, which constitutes 30% of the final grade, is awarded at the end of the project and is intended to assess the degree of application of the student to the project and the quality of work undertaken. The project supervisor and second examiner award this grade jointly. The basis for assessment of the implementation is detailed in Appendix C.

2.6 Exhibition Day

Students are expected to display and discuss their projects with students and staff of this and other departments, as well as with members of the profession and the public, on the afternoon of the Exhibition Day. Consequently, one member of the group must be present at the display at all times to field questions. During the afternoon, representatives of the industrial sponsors of the Project Prizes (see Section 6.0) will judge all projects. The Exhibition Day is an important event in the life of the Department and students will be expected to present themselves well and not to leave their project displays unattended. The day will end with a social function for all concerned. Parents and partners are also invited to attend the Exhibition Day and social function.

3. Overall Project Assessment

Each component of the project contributes to the final grade in courses ELECTENG/COMPSYS/SOFTENG700A/B according to the weightings listed in Table 3.1.

Table 3.1: Assessment weightings

Component	Weight
Interim Report	10.0%
Final Report	45.0%
Seminar	7.5%
Exhibition	7.5%
Project Implementation	30.0%

Appendix C discusses the basis on which the various components of the project will be assessed. The project supervisor and second examiner will assess each report independently. At least two members of staff will assess both the seminar and exhibition. In each case, assessment will be on the basis of the quality of the presentation, its clarity, the extent to which it is well structured, the use of audio and visual material, etc.

Project implementation (i.e. the extent to which the student has applied himself/herself to the project and the overall quality of work) will be assessed jointly by the project supervisor and second supervisor. The grade for implementation will be awarded at the conclusion of the project and is based on the whole year's work. However a projected implementation grade

will be awarded midway through the project in order to give feedback on progress. The projected implementation grade should be used by students to assess their own performance - this is the grade that the supervisor and second supervisor think the student will receive at the end of the project if his or her application to the work continues unchanged.

4. Project Supervision

Each group will be allocated a supervisor and a second supervisor from the academic staff. Students are strongly advised to develop a close working relationship with their supervisor and to discuss their progress with him or her on a regular basis. Usually this will be done at weekly meetings organised by the supervisor and to which both students in the group are expected to attend. (The meetings will initially be organised by the supervisor, but the project students are strongly encouraged to take an active role in organising meetings and keeping the supervisor informed of progress and problems).

In addition, students may be required to report on their progress at joint meetings with their supervisor and second supervisor. Such meetings could take the form of an informal presentation given by the students. It would be desirable for at least two such meetings to be held during the year.

Students should appreciate that in professional life they will be expected to report regularly to their clients or project leaders. Thus, the presentations and weekly meetings described above should be seen as valuable preparation for this. In addition, it is often only by way of these meetings that supervisors and second supervisors can assess how well students are applying themselves to their projects, and thus decide upon a grade for implementation. Students will be assessed on an individual basis.

5. Penalties

5.1 Late Submission of Reports

Reports submitted late, but within three days of the due date (Monday), will be accepted, but a graduated scale of penalties will apply. The scale of penalties is shown in Table 5.1 below.

Table 5.1: Penalties - assuming a submission deadline of 2:00 p.m. Monday

Late Submission	Penalty	Example
Before 2:00 p.m. Tuesday	1 grade point	B+ becomes B
Before 2:00 p.m. Wednesday	2 grade points	B+ becomes B-
Before 2:00 p.m. Thursday	3 grade points	B+ becomes C+
After 2:00 p.m. Thursday		Report failed

Important Notes

- The deadlines in Table 5.1 will be strictly adhered to. Reports will NOT BE ACCEPTED if they are more than three days late.
- Compassionate grounds for late submission may be considered in exceptional circumstances, but application in writing must be made to the Head of Department as early as possible prior to, but in any event within three days of, the due date.
- Students should note that late submission due to equipment problems associated with

the production of their report will NOT be considered under the category of compassionate grounds. Penalties will be imposed automatically in these cases, as detailed above. Students should therefore plan to prepare their document well in advance of the submission deadline.

- Late material will not be accepted once a report has been submitted.

5.2 Seminar and Exhibition

The seminar and exhibition must be conducted at the scheduled times and dates. The seminar and exhibition timetables are advertised well in advance and students are expected to make themselves available for these project assessment components. Failure to do so will incur a penalty as described in Table 5.2 .

Table 5.2: Penalties relating to the seminar and exhibition

Infraction	Penalty
Failure to attend seminar at which student's own presentation is scheduled.	Seminar grade is 0%.
Failure to attend <i>complete</i> session in which student's own seminar is scheduled (but presents own seminar), or failure to meet with session chairing person 10 minutes prior to start of session.	50% of own seminar grade.
Failure to attend <i>complete</i> session in which student is scheduled to assess other students' seminars, or failure to meet with session chair 10 minutes prior to start of session.	50% of own seminar grade.
Failure to attend exhibition at which student's own presentation is scheduled, or failure to be ready at the scheduled time.	Exhibition grade is 0%.

Important Notes

- The penalties in Table 5.2 will be strictly enforced.
- Compassionate grounds for failure to attend may be considered in exceptional circumstances (as outlined in Section 2.0), but application in writing must be made to the Head of Department as early as possible prior to, but in any event within three days of, the due date.
- Students should note that non-attendance due to lecture clashes, or similar, will NOT be considered under the category of compassionate grounds. Penalties will be imposed automatically in these cases, as detailed above. Students should therefore plan for their seminar and exhibition well in advance of the scheduled times and dates.

6. Project Prizes

During the social function at the conclusion of the Open Day a prize is awarded to the best project in each of several categories. The prize in each category is judged and awarded by an industrial sponsor. Representatives from each of the sponsoring organisations will inspect projects during Open Day and then choose the winning group in each area. If there is no project worthy of a prize in a specific area, then that prize will not be awarded.

All project groups automatically qualify to compete for one prize, and all project groups compete for the Best Poster Prize.

Normally each year's project prize categories are as follows:

- Control Systems
- Electronic Systems
- Embedded Systems
- Image Processing and Visualisation Techniques
- Intelligent Systems
- Power Systems
- Power Electronics
- Radio Systems
- Robotics
- Signal Processing
- Software Tools
- Internet Applications
- Software Applications
- Telecommunications
- Best Poster

7. Project Administration

Matters relating to the overall organisation and administration of projects are the responsibility of the Project Coordinators and any questions regarding such matters should be referred to them. In respect of matters relating to specific projects, students should deal directly with their supervisor.

7.1 Laboratory Access

All EEE, CSE, and SE project groups will be given swipe-card access to the laboratories. In addition, if requested by the supervisor, some project groups will be allocated a workspace in special laboratories to make use of specialist equipment. *All students must realise that this access is a privilege, and that access will be revoked if standard laboratory rules are not followed.*

7.2 Project Resourcing

It is expected that all groups will exercise a degree of professionalism with regard to their conduct as they undertake project. Many projects will require access to physical resources which are limited, e.g. test equipment and all groups are expected to share these resources – not only between themselves but also with postgraduate students and staff who may require access. Planning is the key for effective utilisation of these resources.

It is also important that **NO** items of equipment be moved from one laboratory to another, or outside the Department, without the authorisation. The Department has a considerable investment in equipment which it uses to underpin its various teaching and research programmes, and the unapproved movement of equipment can have serious implications for both scheduling and insurance. For this reason, **ANY** unauthorised movement of equipment will be viewed as a disciplinary matter.

Every EEE and CSE project group will be allocated a primary and a secondary technician. It must also be recognised that the Department only has a limited number of technical staff to support the project activity, and for this reason an 'open-door' access policy will not be possible.

It is expected that all project groups will exercise a degree of self-reliance during the project activity, and excessive reliance on technical support may detrimentally affect implementation grade(s). All groups will be advised soon after the project allocation phase of the technical support arrangements that can be expected for their project.

7.3 Purchasing

Many projects will require the purchase of components from external companies, and it is important that the correct steps are followed to ensure that orders are placed correctly. Details of how to go about placing orders - can be found on the ECE website:

<http://web.ece.auckland.ac.nz/uoa/home/for/student-staff-area>

Appendix A - Format of the Final Project Report

Length

The entire report (including diagrams) should be within 6-10 pages. Students should note that a succinct, well-written report of shorter length could achieve an excellent grade.

Layout

The text must be typed on A4 size paper, including equations.

Font

When writing normal text use a proportional font size as Times Roman or Bookman, However when writing source code (say, in an appendix) use a non-proportional font such as Courier. That way, the formatted code will line-up as it does on screen, making it much easier to read.

The report will be submitted electronically.

Structure

The report consists of a number of sections, and must be included in the order indicated in Table A. 1. A report submitted with any of the required components missing will be considered significantly deficient, and marks deducted accordingly.

Table A.1: Structure of a report

Order	Component	Required	Comments
1	Main Title	√	Separate page
2	Originality	√	Separate page
3	Title and Abstract	√	Not to exceed 200 words
4	Introduction	√	
5	Main Body	√	
6	Conclusions	√	
7	Acknowledgements		
8	References	√	
9	Appendices		Include if appropriate

Format of Title Page

The covering title page should carry, suitably spaced, the information shown in Figure A. 1.

Department of Electrical & Computer Engineering
Part IV Research Project Report
[Year]
[Title of Report]
[Names of author and project partner]
[Name of project supervisor]

Figure A.1: Layout of main title page

Format of Declaration of Originality

A declaration of originality must appear on a separate page and include the wording, appropriately spaced, shown in Figure A.2. By typing the student name below within the electronic submission, the student is making an acceptable declaration

Declaration of Originality

This report is my own unaided work and was not copied from
nor written in collaboration with any other person.

Name:

Figure A.2: Layout of declaration of originality

Students are encouraged to discuss with their colleagues and supervisors aspects of the organisation and style of the report, but such assistance should be of a general nature only. Whilst supervisors may provide general guidance, they are not permitted to edit the report in any way.

Evidence of undue similarity between the reports of students in the same group may lead to the imposition of a penalty for both reports. The report in its final form must be the student's own written work.

With the advent of the Internet and the ease with which information can be disseminated, there is often a very strong temptation to copy material from the web and include it in reports. While the inclusion of information to a limited extent with an appropriate reference can be deemed appropriate, the inclusion of (i) unreferenced material or (ii) excessive amounts of material which has not been written by the author is regarded as plagiarism. There are several services available for the detection of plagiarism. The Department of Electrical and Computer Engineering will make use of any of them for both the interim and final reports.

The University takes a very dim view of acts of plagiarism and if any cases are detected referral to the University Discipline Committee will be made.

Diagrams and Figures

These should be reduced in size where possible and included within the text as close as possible to the section of the text where they are first referenced, but not before. When reducing diagrams, care should be taken to ensure that all parts of the diagram are still clearly readable. It is essential that no part of a diagram be outside the page margins as detailed above.

Every figure or diagram must have a figure number and a descriptive caption. Diagrams and figures must be referred to in the text by their figure number (e.g. Fig. 3.5). The numbering convention for figures should be as follows: Fig. 7.13 (for example), where 7 refers to the section and 13 indicates that it is the 13th figure in that section. It is unnecessary to identify figures in terms of the subsection in which they appear.

Equations

In a technical document it is standard practice to number equations. The same numbering convention as for figures should be used and equations must be referred to by number in the text (e.g. Eqn. 6.35).

References

Every technical report should contain a list of references. These should be referred to explicitly in the text and be ordered in some logical manner (e.g. by numerical order of citation, alphabetically according to author, etc.).

When preparing the reference material, make sure to include the following information listed in Table A.2.

Table A.2: Information required for references

Reference Source Information Required	
Book	<ul style="list-style-type: none">• Author or authors• Book title• Edition• Publisher• Date of publication• Relevant page numbers
Journal, Magazine or Periodical	<ul style="list-style-type: none">• Author or authors• Title of article• Title of journal• Volume number• Issue number
Internet Site	<ul style="list-style-type: none">• Complete URL pointing to information• Date URL valid

Style and Presentation

The style of the report should be appropriate to a technical document and preferably written in the third person with a passive voice. The standard of organisation and presentation is expected to be high, but within reason considering the time and resources available to most students. Students should examine papers published in reputable journals (such as *Proceedings of the IEE*, or *Transactions of the IEEE*) for examples of report layout, formatting references, inclusion of diagrams and tables, language style, etc.

Report Submission

All students must submit their report electronically, information on how to do this will be provided later in the year. The front page must be clearly marked and contain the information given in section Appendix A 4.0. Once all the Project Reports have been assessed, they will be bound and lodged in the library.

Note

Students will not be permitted access to their reports once they have been submitted. Students are advised, therefore, to take a copy of their report prior to submission for use during their seminar and Exhibition Day activities.

Appendix B- Guidelines for Report Writing

Purpose of the Report

The purpose of a report is to inform others and, in this respect, the writing of a report can be improved immensely if the writer keeps in mind that the whole idea of the report is the imparting of information. It is essential that the author identify the audience to which the report is aimed.

Before writing a report, one should consider carefully:

- Why am I writing this report?
- Who is the reader?
- What do I assume the reader knows?
- What do I want the reader to know?
- How can this information best be imparted?

Length of the Report

The length of a report should be determined entirely by its ability to impart useful information, and therefore must only be long enough to cover clearly all essential points. When this has been achieved, it is time to stop.

Writing the Report

Careful planning before commencing to write is essential. For a conference style report, a table of contents list is unnecessary. Consider first the main section headings. Then consider subsection headings. These should make sense of themselves. It may be necessary to refine this structure many times before a logical progression of ideas is achieved.

Once the structure of the report has been semi-finalised, work can proceed on the writing. It is useful to begin by expanding section headings using phrases for paragraphs and words for sentences. You should not proceed further with the report until you are satisfied with this brief outline.

Unless one is a very experienced writer, it is often necessary in the interests of clarity to refine the structure of the report during the writing phase. Many word processors include an Outlining Facility that can be very useful for this.

Report Structure

Technical reports differ widely in the information they are intended to convey and the readership to which they are directed. However the structure of all technical reports is similar and normally consists of the following sections arranged in the order given:

1. Title
2. Abstract (or Summary)
3. Introduction
4. Main Body of Report (divided into sections)
5. Conclusions
6. Acknowledgments (if appropriate)
7. References
8. Bibliography (if appropriate)

The decision concerning which material to include in a report, as well as where to include it, is a matter of judgment on the part of the author. Equally important is deciding which material should be left out. The readability of a report will be determined in great part by its overall structure and logical flow of ideas. The various sections in a report are explained in detail below.

Abstract

Think of the abstract as a substitute, for the report, to a busy reader. Its purpose is to enable potential readers to determine whether the contents are likely to be of any interest to them. Thus the abstract must be a summary of the contents of the report, not an overview of the work being reported. To this end it should give abbreviated details of the investigation, why it was commissioned and by whom, its objectives, and its principal results and conclusions.

An abstract should be brief, self-contained and explicit. Although it appears at the beginning of the report, it should be written only after the rest of the report has been completed. It would normally be no longer than 200 words for a major report, and very much less for short reports, such as those described here.

Introduction

The purpose of the introduction is to introduce the report, not just the project. It should clearly outline the work being reported, why it was commissioned and by whom, its major objectives, the scope and method of investigation, and the principal findings.

Sufficient background material should be given for the reader to appreciate not only the aims and objectives of the work, but also to be in a position to understand subsequent material in the report. The introduction should include an overview of the various sections of the report, outlining in a general way the material to be presented, its relevance to the discussion, and the rationale behind the particular order of presentation.

It should be emphasised that the introduction is not a repetition of the abstract. The abstract is a concise summary of the report, whereas the purpose of the introduction is to present the necessary background and overview such that the report can be understood.

Main Body

The main body of the report should be well organised, with a logical progression of sections. The more care that is taken in structuring paragraphs, introducing ideas, transitioning logically etc., the better the chances are of holding the reader's attention. Excessive detail should be avoided. Only material essential to the discussion and conclusions should appear in the main text, with supporting material being included, where necessary, in the appendices. Whenever possible, one should ensure that relevant theory is referenced, rather than being copied verbatim in the text of the report.

Conclusions

The conclusions are intended to emphasise what the author considers to be the significant findings or outcome of the investigation. They are a restatement of the essential information that the author has tried to impart to the reader. The primary value of a report derives from the nature, originality and soundness of the conclusions. They must be presented clearly and succinctly.

References

Every technical report should contain a list of references. These should be referred to explicitly in the text and be ordered in some logical manner (e.g. by numerical order of citation, alphabetically according to author, etc.).

Bibliography

The bibliography is a list of scholarly texts that, though not necessarily explicitly referenced in the text, have been of substantial assistance during the investigation. These should be listed alphabetically according to author. The information required in the bibliography is the same as that required for a list of references, with the exception of page numbers if appropriate.

Appendices

Material that is too detailed, peripheral, or otherwise unsuitable for inclusion in the main body of the report, may be placed in the appendices if its inclusion in the report is considered to desirable.

Note that the Appendices are included in the page limit of 3-5 and 6-10 pages in the interim and final reports respectively.

Language of the Report

The language of a report is normally -third person, passive voice. However this restriction should be relaxed if its application would lead to clumsy writing. Try to write as you talk - naturally. Short, terse sentences make for clear, easily understood prose. Only experienced writers can write successfully using long sentences!

Use of Illustrations

The use of illustrations (drawings, graphs, and photographs) is very important in any technical report, and full use of these should be made. These illustrations should supplement the text, but not lead or mould the report. In all cases they should be referred to and explained in the text. The reader should be left in no doubt of the essential information contained in the illustration that the author wishes to impart.

All information necessary to reproduce any graph should be included in the report. If a graph has been generated from equations, then the relevant equation numbers should be stated as well in the caption.

Proof Reading

No one, even the most experienced, can write a word-perfect document at the first attempt. The first draft must be read carefully to ensure that what is meant is what is written, and that there are no grammatical and spelling errors, nor any ambiguities. If using a word processor, good use should be made of such tools as spelling checkers, etc. Everyone should own and use a dictionary.

Test of a Well-Written Report

If a report has been written effectively, readers should need to study only the title, abstract, introduction and conclusions to gain a general understanding of the investigation and to gauge its relevance to them. This should be used as a test before submitting a report.

Appendix C - Guidelines for Grading of Project Components

Project Components

There are four main components of the project that will be graded:

1. Implementation
2. Reports (interim and final)
3. Seminar
4. Exhibition

The approach taken to grade each component is slightly different since the components emphasise different facets of the project work.

Table C. 1 summarises the elements that characterise each project component:

Table C.1: Project components and assessment elements

Component	Elements
Implementation	Initiative, competence, diligence, planning, execution, teamwork, division of work, professionalism, degree of independent thought.
Reports	Clarity, professional structure, ability to convey understanding, analysis of options, analysis of results, English expression, technical accuracy, technical depth, conciseness and completeness.
Seminar	Clarity of presentation, structure, question handling, presentation style and skill, understanding, professionalism, emphasis of concepts over detail, use of visual aids.
Exhibition	Clarity and conciseness, division of work, question handling, mastery of subject and problem areas, effective use of presentation time, effective use of poster, clarity of poster.

When assessing a particular component, staff will look for the elements characterising that component and grade according to the guidelines listed in Table C. 2.

Table C.2: Grading scale

Grade	Requirement
Excellent	Excels in nearly all elements
Above average	Excels in one or two elements
Average	Adequate in all elements
Below average	Deficient in two or more elements
Fail	Has deficiencies in most elements

Project Reports

Students should note that one of the principal concerns in grading a project report is whether the report fulfils its objectives, which are:

1. To give a good overall understanding of the project to a reader who may be unfamiliar with the subject matter of the report, but who nonetheless has a professional background in electrical & electronic engineering, computer systems engineering or software engineering.
2. To provide a detailed reference document for those wishing to understand the subject matter of the report in detail and to pursue it further.

To this end, the abstract, introduction, main body of the report and conclusions should largely fulfil the first objective and be complete in themselves. The whole report, including references, bibliography and appendices constitute what might be described as a reference document.

There should be a –top down structurell to the report such that concepts are given first, followed by more detail in block diagrams (or data structure and pseudo code algorithms for software) with full details in appendices. Block diagrams and figures should be described in the text of the report while circuit diagrams etc should be fully annotated in appendices.

The structure and format of the report should be in accordance with that expected in professional journals, such as *Proceedings of the IEE* or *Transactions of the IEEE*.

Seminar

The following aspects will be considered in grading a seminar:

- A clear description of the project
- An explanation of why it has been undertaken
- The application of the work
- The overall nature of the solution and why this was adopted
- Some of the findings of the work
- The current status of the project (were the aims of the project achieved?)
- Recommendations for future work

Material on, for example, the Power Point slides should be clear, appropriate and easy to read. Students should demonstrate that they understand the project, not only in terms of specific details, but also in terms of its relationship to a wider sphere of activity. Students are graded individually by both academic staff and fellow students.

Software Presentation Tools

In recent years there has been a tendency for students to use presentation tools such as Microsoft PowerPoint to deliver their seminars. While PowerPoint can improve the visual appeal of some presentations, it is not a requirement that students use it and presentation grades do not improve simply by making use of these tools. Neatly prepared transparencies can be just as effective.