THE UNIVERSITY
OF ADELAIDE
AUSTRALIA

Final Year Honours and Design Project Handbook 2010

School of Electrical and Electronic Engineering

Change History

Date	Change	Author
4 March 2010	Initial version for 2010	CAG, MJL, BWN
10 March 2010	Formatting Added Appendix F: Proposal seminar rubric	MJL, BWN

Contents

1. Introduction

This booklet is intended to bring all the information concerning the Final Year Honours and Design Projects to one place and should be as first point of reference to answer any queries regarding the project. It will probably not answer all queries but should be a good reference for most aspects of the project work.

If anyone has any other documents that should be included or any correction to the information contained herein please contact me and I will take the appropriate action.

I would like to thank Mrs Yadi Parrott for her help in ironing out all the inconsistencies in the formatting and general presentation of this document.

Charlie Green

Project Co-ordinator

February 2010

2. Important Dates and Deadlines

LEVEL 4: ELEC ENG 4036A/B DESIGN PROJECT WORK (6 units)
LEVEL 4: ELEC ENG 4039A/B HONOURS PROJECT WORK (6 units)

The tables below show important dates for final year project work. If projects are to progress smoothly it is important that all concerned meet these dates.

IMPORTANT DATES AND DEADLINES FOR STUDENTS

1st Semester	
Dec of previous year	Projects open to student for selection .
Orientation Week	Student allocation to projects complete
Orientation Week	Project Groups arrange a meeting with their supervisor
Week 3	Proposal Seminars
Week 5	Stage 1 Design Document
Week 6	Peer Review Of Stage 1 Design
Week 11	Progress Report
Week 12	Interim Performance
2nd Semester	
After Week 8	Final Project Seminar
Week 11	Final Project Report
	Final Performance
Week 12 (Friday)	Project Exhibition Day

Important Dates and Deadlines for Supervisors

1st Semester	
Week 1	Meet project students to discuss project.
Week 3	Proposal Seminars
Week 5	Stage 1 Design Document
Week 6	Peer Review Report from Students
Week 11	Progress Report
Week 12	Interim Performance
2nd Semester	
After Week 8	Final Project Seminar
Week 11	Final Project Report
	FinalPerformance
Week 12 (Friday)	Project Exhibition Day

LEVEL 4: ELEC ENG 4036A/B DESIGN PROJECT WORK (6 units)
LEVEL 4: ELEC ENG 4039A/B HONOURS PROJECT WORK (6 units)

The tables below show important dates for final year project work. If projects are to progress smoothly it is important that all concerned meet these dates.

IMPORTANT DATES AND DEADLINES FOR MYE STUDENTS

1st Semester	
Dec of previous year	Projects open to student for selection .
Orientation Week	Student allocation to projects complete
Orientation Week	Project Groups arrange a meeting with their supervisor
Week 3	Proposal Seminars
Week 5	Stage 1 Design Document
Week 6	Peer Review Of Stage 1 Design
Week 11	Progress Report
Week 12	Interim Performance
2nd Semester	
After Week 8	Final Project Seminar
Week 11	Final Project Report
	Final Performance
Week 12 (Friday)	Project Exhibition Day

Important Dates and Deadlines for Supervisors

1st Semester	
Week 1	Meet project students to discuss project.
Week 3	Proposal Seminars
Week 5	Stage 1 Design Document
Week 6	Peer Review Report from Students
Week 11	Progress Report
Week 12	Interim Performance
2nd Semester	
2nd Semester	
After Week 8	Final Project Seminar
Week 11	Final Project Report
	Final Performance
Week 12 (Friday)	Project Exhibition Day

3. Course Description

4039A/B - Honours Project

Course Code:	ELEC ENG 4039A/B
Course Title	Honours Project
Academic Year:	2010
Semester:	1 and 2
Units:	6
Lecturer:	Mr. C.A. Green
E-mail Address:	cgreen@eleceng.adelaide.edu.au

Aims:

The final year Project Work aims to give you experience in solving real engineering problems and the opportunity to apply the knowledge you have gained during the course. Through the project you will gain experience in project planning, in teamwork and in communication with management and support staff. The project will also develop your design and research skills.

Learning Objectives

In this course students will:

1. Deepen their knowledge and understanding of at least one field of technology
2. Develop research skills through investigation of open-ended problems; devising solutions and developing and testing of hypotheses as necessary.
3. Develop practical skills through coding and/or construction and testing.
4. Develop project management skills (including planning; risk management; time management; delegation; development of test plans)
5. Develop communication skills, both written (report writing; specifications; critical review) and oral (seminar presentation; negotiation; verbal reports)

Honours vs. Design Project:

At the beginning of their final year, students are selected into the honours or non-honours streams. The minimum requirement for selection for the honours stream is a weighted average of 60% over levels 2 and 3 of the degree, where the relative weighting of the levels is 2:3 respectively, based on their second and third year results (for more detailed information on this process see the honours assessment document). Honours projects are generally more challenging than design projects and involve a greater degree of research content. Students in the Honours Project are expected to show a higher level of innovation and independent thinking than those in the Design Project, and the projects will be framed accordingly. Apart from this, the assessment process is the same with the two projects.

Project Allocation:

Students will be given an opportunity to give preferences to their project. Further information will be provided on this process. At the beginning of the semester you will be assigned to a supervisor and be informed of the first meeting time and place. It is essential that you be present for this meeting as your supervisor will discuss project and group allocation.

Duration:

You are expected to spend approximately 300 hours on your project. 1st Project Semester: week 1 to week 12 (150 hours nominally), 2nd Project Semester: week 1 to week 11 (150 hours nominally).

Assessment

The final year project assessment will be based on nine components as outlined in the table below. The detailed requirements for each of the deliverables are provided in the Project Handbook, available on the course web site.

The assessment of each component will be performed by one or more of:

- The principal supervisor
- The co-supervisor
- An independent assessor (a member of the School's academic staff who is not otherwise associated with the project).

In performing the assessment of each component the assessors will use a customised rubric. This will allow them to rate each student's (or group's) performance on several facets at one of five levels. They will then provide an overall assessment grade of A to E for of the deliverable, indicating that the achievement is generally at Level 5 (for A) down to Level 1 (for E).

The final mark for the project will be determined by combining the grades for each of the nine components, use the weightings indicated in Table 1 as a guideline.

All components of assessment must be completed by every student, and failure to submit any deliverable may result in the student failing the course. Similarly failure to actively engage with the project group and meet with the project supervisors regularly may result in a fail grade. Any students having difficulty meeting the schedule of deliverables or attending project meetings should consult with their supervisors as soon as possible.

	Component	Deliverable	Group / Individual	Due	Assessed by whom	Weight	Learning Objectives
1	Proposal seminar	Seminar	Group	Semester 1 week 3	Supervisor, co-supervisor	5%	2,3,5
2	Stage 1 design document	Report	Group	Semester 1 week 5	Supervisor, co-supervisor	5%	1,2,5
3	Peer review of Stage 1 design	Report	Individual	Semester 1 week 6	Supervisor	5%	2,5
4	Progress report	Report	Individual	Semester 1 week 11	Supervisor, co-supervisor	10%	1,2,3,5
5	Interim performance	Journal	Individual	Semester 1, week 12	Supervisor, co-supervisor	10%	1,2,3,4
6	Final seminar	Seminar	Group	Semester 2, mid-semester break.	Independent assessor	10%	1,2,3,4,5
7	Final report	Report	Individual	Semester 2 week 11	Supervisor, independent assessor	20%	1,2,3,4,5
8	Final performance	Journal	Individual	Semester 2, week 12	Supervisor, independent assessor	30%	1,2,3,4
9	Project exhibition	Display	Group	Semester 2 week 12	Independent assessor	5%	3,5

Table 1: Assessment Components

All reports should be handed in to the School Office. A late penalty of 20% of the maximum report marks is applied for each day beyond the nominal hand-in date. Supervisors will vary this rule only in the most unusual circumstances, and then only with the approval of the Head of School.

Information Checklist when Starting Your Project (This information is contained in the Project Handbook)

- Project Start-up Checklist : important things to do in starting your project
- Project Resources: information on budget, equipment, etc.
- Guidelines for Project Assessment : how your final mark is determined
- Guidelines for Project Proposals : how to write your project proposal

Graduate Attributes

GA1 An advanced level of knowledge and understanding of the theory and practice of Electrical and Electronic, Computer Systems or Telecommunications Engineering and the fundamentals of science and mathematics that underpin these disciplines.

GA2 A commitment to maintain an advanced level of knowledge throughout a lifetime of engineering practice and the skills to do so.

GA3 The ability to apply knowledge in a systematic and creative fashion to the solution of practical problems.

GA4 A commitment to the ethical practice of engineering and the ability to practice in a responsible manner that is sensitive to social, cultural, global, legal, professional and environmental issues.

GA5 Interpersonal and communication skills for effective interaction with colleagues and the wider community.

GA6 An ability to work effectively both independently and cooperatively as a leader, manager or team member with multi-disciplinary or multi-cultural teams.

GA7 An ability to identify, formalise, model and analyse problems.

GA8 The capacity to design, optimise, implement, test and evaluate solutions.

GA9 An ability to plan, manage and implement solutions that balance considerations of economy, quality, timeliness and reliability as well as social, legal and environmental issues.

GA10 Personal attributes including: perseverance in the face of difficulties; initiative in identifying problems or opportunities; resourcefulness in seeking solutions; and a capacity for critical thought.

GA11 Skills in the use of advanced technology, including an ability to build software to study and solve a range of problems.

GA13 An ability to utilise a systems approach to design and operational performance.

GA14 Understanding of the principles of sustainable design and development.

These programs also foster the graduate attributes of the University of Adelaide and the Institution of Engineers Australia. These should be read in conjunction with the list above.

Assessment of Graduate Attributes

Attributes GA1, GA2, GA3, GA4, GA6, GA7, GA8, GA9, GA10, - GA14 are all assessed through the project work while GA5 is assessed through the reports and seminars presented by the students as part of their project.

C.A. Green
Project Coordinator

cag.clg:rev. February 2010

4. Assessment

The final year project assessment will be based on nine components as outlined in the table below. The detailed requirements for each of the deliverables are provided in later sections of this handbook. Note that when a deliverable is designated as a "Group" only one item is required and all members in the group will obtain the same grade for that work. If a deliverable is designated as "Individual" each member must produce their own document.

The assessment of each component will be performed by one or more of:

- The principal supervisor
- The co-supervisor
- An independent assessor (a member of the School's academic staff who is not otherwise associated with the project).

In performing the assessment of each component the assessors will use a customised rubric, similar to that in Appendix A. This will allow them to rate each student's (or group's) performance on several facets at one of five levels. They will then provide an overall assessment grade of A to E for of the deliverable, indicating that the achievement is generally at Level 5 (for A) down to Level 1 (for E). The assessors will notify the students of their grades and provide feedback indicating the reasons for the assessed level.

	Component	Deliver-able	Group / Individual	Due	Assessed by whom	Weight	Learning Objectives
1	Proposal seminar	Seminar	Group	Semester 1 week 3	Supervisor, co-supervisor	5%	2,3,5
2	Stage 1 design document	Report	Group	Semester 1 week 5	Supervisor, co-supervisor	5%	1,2,5
3	Peer review of Stage 1 design	Report	Individual	Semester 1 week 6	Supervisor	5%	2,5
4	Progress report	Report	Individual	Semester 1 week 11	Supervisor, co-supervisor	10%	1,2,3,5
5	Interim performance	Journal	Individual	Semester 1, week 12	Supervisor, co-supervisor	10%	1,2,3,4
6	Final seminar	Seminar	Group	Semester 2, mid-semester break.	Independent assessor	10%	1,2,3,4,5
7	Final report	Report	Individual	Semester 2 week 11	Supervisor, independent assessor	20%	1,2,3,4,5
8	Final performance	Journal	Individual	Semester 2, week 12	Supervisor, independent assessor	30%	1,2,3,4
9	Project exhibition	Display	Group	Semester 2 week 12	Independent assessor	5%	3,5

Table 2: Assessment Components

The final mark for the project will be determined by combining the grades for each of the nine components, use the weightings indicated in Table 1 as a guideline.

Final year project assessment rubric for: Project Performance

Level of Autonomy

Facet of Achievement	Achievement Level 1 *Students operate at the level of a **closed inquiry*** / achieves **criteria at a minimal level***	Achievement Level 2 *Students operate at the level of a **closed inquiry*** / achieves **criteria at a satisfactory level***	Achievement Level 3 *Students operate at the level of a **closed inquiry* independently** / achieves **majority of the original set of criteria***	Achievement Level 4 *Students operate at the level of an **open inquiry*** / achieve criteria autonomously and systematically*	Achievement Level 5 *Students operate at the level of an **open inquiry*** / achieves criteria autonomously with rigor and innovation*
*A. Students embark on **inquiry*** and so determine a need for knowledge / understanding (10%)*	☐ Performance not satisfactory ☐ Project objectives not specific enough to guide the project	☐ Performance minimally satisfactory ☐ Individual project objectives are clear, however do not give coherent guidance for project	☐ Performance satisfactory for closed inquiry ☐ Project objectives are clearly focussed and fit together to form a clear overall plan for a closed inquiry	☐ Performance is strong and focussed on achieving stated objectives ☐ Student clearly focuses objectives to guide an effective open inquiry project	☐ Performance is outstanding and focussed on achieving stated objectives ☐ Student articulates objectives that have potential for new lines of inquiry
B. Students find/generate needed information / data / ideas using appropriate approach / method (20%)	☐ Search is too narrow/too broad ☐ Information is from low quality sources ☐ Little evidence of an effective search strategy	☐ Search includes a number of research-based studies ☐ Information is from mixed quality sources ☐ Moderate evidence of an effective search strategy for closed inquiry	☐ Search includes key research-based studies on a topic defined by lecturer ☐ Closed inquiry information is consistently from quality sources ☐ Extensive evidence of an effective search strategy for closed inquiry	☐ Search includes key research-based studies on topic defined by student ☐ Open inquiry information is consistently from quality sources ☐ Extensive evidence of an effective search strategy for open inquiry	☐ Search includes key research-based studies on topic defined by student ☐ Open inquiry information is high quality and from multiple source types ☐ Outstanding evidence of an effective search strategy for open inquiry
*C. Students **critically evaluate** information / data / ideas, their approach and results, **and** react appropriately (30%)*	☐ Little evidence of critical evaluation of information / data / ideas ☐ Achieved results of little or no technical merit ☐ Little stated awareness of the work's significance, strengths and weaknesses	☐ Evidence of critical evaluation of about half of information / data / ideas ☐ Achieved results of low technical merit ☐ Some stated awareness of the work's significance, strengths and weaknesses	☐ Evidence of critical evaluation of information / data / ideas in most cases ☐ Achieved results of moderate technical merit ☐ Consistently stated awareness of the work's significance, strengths and weaknesses	☐ Evidence of critical evaluation of information / data / ideas in most cases related to open inquiry ☐ Achieved results of good technical merit ☐ Consistently stated, substantial awareness of the work's significance, strengths and weaknesses	☐ Extensive evidence of critical evaluation of information / data / ideas related to open inquiry ☐ Achieved results of high technical merit ☐ Consistently stated critical awareness of the work's significance, strengths and weaknesses
*D. Students **perform necessary** processes to meet stated project objectives (15%)*	☐ Sporadic progress ☐ Missed milestones regularly ☐ Disengaged with project	☐ Intermittent progress ☐ Missed milestones occasionally ☐ Somewhat engaged with project	☐ Regular progress ☐ Missed some milestones ☐ Generally engaged with project	☐ Rapid progress ☐ Missed milestones rarely ☐ Well engaged with project	☐ Very rapid progress ☐ No missed milestones ☐ Highly engaged with project
*E. Students **organize themselves** effectively and adequately manage human input to project (10%)*	☐ Meetings infrequent, undocumented ☐ No collaborative methods evidenced ☐ Do not update project plan in wake of circumstances	☐ Meetings infrequent, adequately documented ☐ Basic collaborative methods evidenced ☐ Rarely re-visit project plan for updates	☐ Meetings regular, reasonably documented ☐ Some collaborative methods evidenced ☐ Occasionally re-visit project plan for updates	☐ Meetings frequent, well documented ☐ Effective collaborative methods evidenced ☐ Regularly re-visit project plan for updates	☐ Meetings frequent, meticlously documented ☐ Innovative & effective collaborative methods evidenced ☐ Often re-visit project plan for updates

F. Students communicate project objectives, achievements and the process (15%)	☐ Incoherent/inconsistent journal/logbook entries ☐ Primitive documentation system / minimum evidence in log books	☐ Somewhat coherent/ consistent journal/logbook entries ☐ Basic documentation system / some evidence in log books	☐ Coherent/consistent journal/logbook entries ☐ Good documentation system / good evidence in log books	☐ Mostly coherent/consistent journal/logbook entries ☐ High quality documentation system / strong evidence in log books	☐ Highly coherent/consistent journal/logbook entries ☐ Outstanding quality documentation system / very strong evidence in log books

* Inquiry may range from closed (supervisor specified) to open (student specified) in terms of: i) research question; ii) method, algorithm or hardware equipment; iii) interpreting result, evaluating hardware equipment or proposing future inquiry.

Specific Comments:

A. Students embark on inquiry and so determine a need for knowledge / understanding (10%)*	
B. Students find/generate needed information / data / ideas using appropriate approach / method (25%)	
C. Students critically evaluate information / data / ideas, their approach and results, and react appropriately (25%)	
D. Students perform necessary processes to meet stated project objectives (15%)	
E. Students organize themselves effectively and adequately manage human input to project (10%)	
F. Students communicate project objectives, achievements and the process (15%)	

Grade: _____

5. Policy for Provision of Resources for Final Year Projects

- Budget. Your supervisor has been provided with a budget equivalent to $250 per student. In your planning for the project, you must develop a costed proposal for approval by your supervisor. If the proposed costs exceed the School budget allocation, then your supervisor may approve additional funds from other sources.
- Equipment. You have access to a pool of general purpose test equipment kept in the cupboards in the Final Year Laboratory EM305. This equipment must be booked through the storeman (N226). Certain equipment in heavy demand may only be booked for short periods of time. Your supervisor may also allocate to you specialized equipment for which you will not need to make a booking.
- Purchase of components. The storeman will provide commonly needed electronic components. If a special purchase is required, you will need permission from your supervisor. To submit a request for a special component order, use the component request form on the store website. For purchases of software or books, contact the laboratory manager.
- The Store Website can be accessed from almost any PC in the Electrical and Electronic Engineering School by typing the word 'store' into the Location bar of any web browser. If you are using a PC outside the School, such as in the CATS, you will need to type in http://store.eleceng.adelaide.edu.au to access the site. The Store Website cannot be accessed outside the University.
- Computing. General purpose computing equipment is available in the school computing laboratory EM211. This equipment normally has specialized software packages such as compilers, PROTEL, ALTERA, EPROM programming. Consult the notice on the door of EM211 for further information. To access this software you will need a School computer account from School computing staff, with permission from your supervisor. For general purpose computing, please use the CATS. Your supervisor may allocate to you a dedicated computer for other specialized packages such as compilers for DSPs etc. You have a free printing quota that will allow you to print your proposal and final report. You will not be permitted to increase this quota using your project budget.
- Accommodation. You will be allocated one bench or table in one of the laboratories for your project.
- Seminars. Data projectors for PowerPoint presentations will be made available to all project groups without the requirement for prior booking.
- Other Resources. If you require other special resources for your project, then you should discuss this first with your supervisor. If the equipment is available in the School, contact the laboratory manager for access permission. He will require you to have permission from your supervisor and the nominal "owner" of the equipment.
- Allocation of bench space and pc's. Allocation of both these resources can be achieved on line at

http://www1.eleceng.adelaide.edu.au/students/undergraduate/infrastructure-request.html

6. Getting Started

Project Startup Checklist

Getting your project off to a good start is an important step to a successful outcome. The following information gives you a guide on how to start your project. Note that you should be spending about 12 – 15 hours per week on your project. It is important that you make this time available, especially at the start of the project.

1. Determine Supervisor and Meeting Information (FY Noticeboard)

Find out who your supervisor is, and the details of the first meeting time and location (see the Final Year noticeboard, EM318). This information will be available on Monday morning of the first week of the semester.

2. Enrol For and Attend a Literature Search Seminar (FY Noticeboard)

An important part of the project is a critical survey of existing published material relating to your project investigation. This involves locating, reading and analysing the relevant material. To help you locate such material, a Literature Search Seminar will be arranged with the Engineering Research Librarian, Kay Leverett, at the Barr Smith Library. She will explain how you can find out more information about your particular topic using the electronic resources. See the FY noticeboard to sign up for a slot in one of the seminars which will be held in the first or second week of the semester.

3. Attend Talk on Laboratory and Computing Facilities (FY Noticeboard)

All project students are required to attend a talk by the Laboratory Manager and the Computing Engineer in week one, at a time and date to be advised on the FY noticeboard. The Laboratory Manager will discuss the use of the laboratories, store and workshop, and safety in the workplace. The Computing Engineer will outline the computing facilities in the School and the CATS, and will discuss the rules and regulations when using the facilities.

During the planning stage of your project, you can seek advice on computing facilities or equipment availability from the Computing Engineer and the Laboratory Manager. They may direct you to other members of the technical staff for more detailed discussions.

4. Attend the risk assessment lecture

Time and date of this lecture will be emailed to students and put on the notice boards

5. Purchase a Laboratory Notebook and Bring to First Meeting

Each student must maintain a project workbook. This should be a daily diary of your progress and should include notes from all meetings, problem encountered, decisions made, design ideas and sketches, references to data sources, calculations, equipment settings, experimental results etc.

A good workbook forms a valuable record of your work which you can refer to in later parts of your project and is an excellent source of information for your final report.

Workbooks are submitted with your project report and are taken into account in assessment. They should always be brought to the project meetings.

6. Meet Your Supervisor

At the first meeting you will obtain group and project allocation information. Your supervisor will explain the aims and objectives of the project, and the deliverables expected on completion of your project work.

The supervisor will also give you some background information and pointers for starting your literature investigation.

The supervisor's role is to provide advice and guidance, and to ensure that your project proceeds in a fruitful direction. You should not expect your supervisor to do your thinking for you, or give you detailed step-by-step instructions on what to do. You are expected to generate your own ideas, to seek out information for yourself, and to make your own decisions about what to do and how to do it.
At this first meeting, arrangements are normally made for regular (usually weekly) meetings. Note that it is the responsibility of the student to keep the supervisor informed of progress on the project.

7. Meet Your Group Members

At the first meeting it is a good idea to collect contact information (email, telephone) from your other group members and also to compare timetables to determine when you are all available to have group meetings or work together.

8. Attend Electrical Safety Session (for students working in the Power Laboratories only)

If you will be working in the ground floor Power Laboratories you will need to attend an Electrical Safety session. Your supervisor will inform you if this is necessary and tell you the time and location of the session.

9. Begin Writing Your Project Proposal

The proposal forms your roadmap for the project. It should describe why the project is important, what has been done before, and clearly explain what you are aiming to achieve and how you plan to go about it. More information on the content of the proposal is described separately.

Note that the proposal is only an initial plan and the actual course of the project may change during the year. Major changes are possible but they should be carefully discussed with your supervisor before proceeding.

10. Begin Your Final Report and Technical Paper

It is a mistake to begin your final report a week or two before it is due. It is at this time that you may be busy doing the technical work on your project and can least spare the time required.

The best practice is to write up your report as you go along. A good technique is to create a word processor document at the beginning of the year as your "electronic workbook". As you progress through the project, you should draw key figures and store them in this document. You can also include key results from simulations and experiments, and photos of equipment etc. This will save you substantial effort at the end of the project, as you will already have the majority of the figures and data for your report.

As you complete each section of work, which may form a chapter in your final report, it is worthwhile highlighting important aspects to be covered in this chapter of your final report.

Using the above technique, you will find it much easier to complete your final report at the end of the year. You will also easily recognise if you are missing important information from the report.

7. Important Advice for the Start of Your Project

(B. J. Phillips, June 2005

The Project Proposal

Take your project proposal very seriously. The work you do planning and researching your project at the start can make an enormous difference to the quality of your project.

Break the project into small tasks (no bigger than 2-week).

Assign a deliverable (or milestone) to each task. Make sure they are things you can demonstrate.

Do not just assign blocks of time to 'learning', 'researching', or 'choosing'. Specify what the demonstrable, useful, outcomes of this activity will be for example:

If you need to learn a new piece of software then use it to do something useful. For example: '

Use Protel to design a prototype PCB containing the power supply components only.'

If you need to learn a new programming language then specify a small, useful program you will write in the language. If you need to do some research then specify the questions you will answer and how you will present the answer for example:

'Review the theory of LDPC codes and produce an interim report showing the equations used by an LDPC coder and decoder.'

If you need to make a decision then produce an interim report which compares the alternatives and justifies the decision. For example:

'Review available microcontrollers, compare them on the grounds of availability, cost and suitability for the project, and select a microprocessor for order. The results will be presented in an interim report'

Identify who will be doing each task. Remember that it is really very hard for 2 people to work on the same thing at the same time.

Do not just put 'documentation' or 'writing-up' as a big task performed in parallel with the rest of your project. Break the documentation down into smaller steps with deliverables. (The interim reports suggested in the previous points are one way of writing your report as you go. Each interim report can eventually form a section of your final report.)

Breaking up a project like this is hard, especially at the start when you do not fully understand the project, but that is when you must do it. If you do not have a plan at the start of the project, you will not have one until it is too late.

Do not get bogged down with the background or the theory.

In your reports, consider breaking the background into 2 sections, motivation and background theory.

In the motivation sections you need to describe the context (or big picture) of the project. You need to write just enough to allow the reader to understand why your project is important and interesting and what the likely constraints of the project are. Exciting and interesting as it may be, you must not present any more than these bare essentials. For example, you may be building a motor drive unit for a surgical robot. You do not need to spend any more than a short paragraph explaining the history of surgical robots and why they are better than the alternatives.

It is sometimes helpful to present background theory in your reports.

You should present enough theory to help the reader (e.g. one of your class mates) understand the report.

When things go wrong with your project:

If you fall behind your schedule you must either re-design your schedule or work hard to get back on track.

If the project is not going well, make a noise. Let your supervisor know. Let your project team know. Do not leave it to the last minute to try and get things back on track.

Do not let anyone or anything hold you up. You may have to wait for software to be installed. You may have to wait for parts to be delivered. You may have to wait for your supervisor to answer your questions. Do not let these things stop you. Find something else to do, find a way around, get help from someone else or fix the problem yourself.

Things will go wrong. How you handle problems is an important aspect of the project. Fix the problems and don't just blame other people.

8. Guidelines for the Proposal Seminar

SEMINAR TIME AND LOCATION

The proposal seminars will take place in week 3 except due to supervisor availability restrictions. Please see the seminar timetable on the course website for the date, time and room of your seminar. You will also need to attend the other seminars in the stream in which your seminar is scheduled. No changes in the schedule for seminars are permitted except in special circumstances. Digital projectors will be available in every seminar room. You do not need to book this. You will need to create your presentations using Powerpoint and bring it to the seminar on disk. See below for information on practice sessions. If you have any requirements apart from a basic Powerpoint presentation please see the Laboratory Manager.

PRACTICE SESSIONS

Practice sessions will be arranged before the presentations. More information on this will be provided on the final year noticeboard shortly before the start of the presentations.

Please follow the instructions on the digital projectors for turning them on and off. If these instructions are not followed, the projector lamp could be damaged and the projector may not be available for use during the seminar period. If you have any questions about the use of these projectors please see the Laboratory Manager.

ASSESSMENT

Two staff members will be present for each seminar: the supervisor and ether the co-supervisor or an independent assessor. The seminar assessment will be performed using the rubric in Appendix F.

SUGGESTED TIME ALLOCATION FOR DETAILED PROPOSAL SEMINAR

Each seminar must finish within the allotted total seminar length time to allow time for the next group to setup their talk. The ability of the group to finish within the allotted group presentation time will be taken into account in assessment.

The seminars will be presented in a group with each group member presenting an approximately equal section of the talk. The table below gives the approximate presentation time per speaker and the discussion time.

Group Size (students)	Presentation Time Per Speaker	Total Group Presentation Time	Discussion Time	Total Seminar Length
1	10 mins	10 mins	10 mins	20 mins
2	7.5 mins	15 mins	10 mins	25 mins
3	5 mins	15 mins	10 mins	25 mins
4	5 mins	20 mins	10 mins	30 mins
5	5 mins	25 mins	10 mins	35 mins

The first speaker should introduce themselves and the other group members. It is preferable that each group member speaks on only one occasion.
Sessions should start and finish on time as staff have to move between streams, but sessions should not start until staff are present.

As a general rule, the number of overheads should not exceed the number of minutes allotted for presentation. Thus for a 15 minute presentation, no more than 15 slides should be used. Each group should provide a copy of their presentation (printed six slides per page) to their supervisor and the moderator at the start of the presentation.

> The scheduling for seminars is usually very tight, with other students and staff often having commitments immediately before and after the seminar. It is a matter of professional courtesy to not use up more of other people's time than they have been asked to commit. It is therefore very important that your seminar starts on time and that you do not run overtime. Any significant deviations from your allocated time will be penalised.

CONTENT

Seminars should be aimed at the technical level of the student audience. As they may be unfamiliar with the topic, clear explanation should be given to the overall background, nature, scope and aims of the project. Even distribution of load, logical order of presentation and cohesion are part of the assessment criteria. Careful preparation will be necessary to ensure that this is successfully achieved in the time allocated.

9. Guidelines for the Stage 1 Design Document

The Stage 1 Design Document is a group report. That is, each project group will hand up a single report and the group will receive a single mark. Note that in all other parts of the project assessment, students will receive individual marks.

The general requirements for the proposal are as follows :

- maximum length of eight pages, not including title page, abstract, table of contents, references and appendices.
- the abstract (not more than 100 words) should summarise the project and should be easily understood by a reader with only a general engineering background.
- appendices can be used to include extra information for completeness but these will not necessarily be assessed.
- layout : use a 12pt font, 1.5 line spacing, print only on one side of the paper.
- All proposals must include an Occupational Health and Safety risk assessment of the work that will be carried out during the project. This section will highlight any parts of the work that present a risk to those involved in the project and the severity and likelihood of any incidents occurring.

At the first meeting, your project supervisor will explain the aims of the project. The proposal is a chance for you to clearly explain back to your supervisor what you think is required. It should clearly state the aims and objectives of the work, the required tasks, and state as precisely as possible what the desired final outcome(s) of the project are. It should also give a list of milestones with corresponding dates and clearly separate the required task into individual roles.

The proposal is a critical part of any project as it ensures that you understand what the "customer" (in this case your supervisor) really wants and provides a clear written set of specifications. A possible outline is:

Example Proposal Outline

1. Aim. Briefly, what is the project trying to achieve?

2. Background and Significance. Why is the project important? What applications do the project results have? If the project is successful, what difference will it make? What is the history behind the project? What have you found from your literature review? What has been tried before? What are the critical issues?

3. Requirements. What are the key specifications and requirements of the project? What will be produced by the end of the project? As far as possible, give a detailed description of the required hardware/software interface(s), operation and performance. This section is important as it forms the basis for the remainder of the proposal.

4. Proposed Approach. Show a block diagram of proposed system/algorithm/approach to meet the requirements. Discuss each part including particular issues or risks. If you foresee that there may be difficulties using your planned approach, do you have a back-up approach? Here you are showing that you have thought about what is necessary to meet the requirements and understand possible issues and risks. Use pictures/diagrams to illustrate your ideas.

5. Milestones, Timeline and Division of Work. What are the key milestones/tasks during the course of your project? Who is responsible for each part of the project? When do you expect to accomplish these milestones? Can tasks be done in parallel? How can the project be organised to make the most efficient use of the time available (what is the critical path)? This information is helpful for both you and your

supervisor to keep track of your progress on the project as it allows you to compare your progress versus your original schedule.

6. Proposed Budget. You have a limited budget (refer to the project resources information sheet for the actual budget information). What hardware, software, test equipment etc will you need to complete the project? Are these already available in the school? If not how much will these cost? It is important to take into account that certain specialised parts may take a significant time to purchase and this should be factored into your timeline.

7. References. List of references and possible sources of information such as research papers, reports from previous students, textbooks, Web pages etc.

Notes

- you should discuss with your supervisor the content of the proposal as different projects may require different aspects to be covered.
- after submission of the proposal, your supervisor will provide feedback on it and may suggest changes before the project proceeds further.
- during the course of the project you may find that you will need to make major changes to your proposal. In this case you should consult with your supervisor before proceeding.
- the proposal can form a good start to your final report.

Assessment Cover Sheet

The assessment cover sheet must be signed and included with your Stage 1 Design Document and submitted to your supervisor.

10. Guidelines for the Final Year Project Reports

These guidelines apply to both the Progress Report and the Final Report.

Aims of the Report

1. to provide a detailed summary of the aims, methods and results of your project for your supervisor/customer and other interested parties. It is thus important to give a clear background to the project for non-specialist readers.

2. to allow your supervisor to make an assessment of your efforts on the project. You thus need to show the breadth of what you accomplished as well giving technical details to show the depth of your understanding.

3. to possibly allow future students continuing/extending the project to understand the background to the project, what approaches were used, what results were obtained and what future work remains.

General Report Requirements

Individual reports must be done by all project students.

Hardcopies: one hardcopy of the report must be submitted to the School Office by the appropriate deadline. This copy will not be returned and so it is recommended that students make an additional hardcopy of the report for their own use. Students will be provided with two sets of front and back covers for their report.

Electronic copy: An electronic copy of the whole report in pdf format must be submitted to the supervisor. Each group should hand up a single CD to their supervisor containing the electronic copies of the project report, their Powerpoint presentation from the final project seminar, and copies of any software and other documentation.

Page Length:
For the final report: a maximum of forty (40) pages of text, diagrams, tables and figures not including the title page, table of contents, executive summary, references and any appendices. Note that the material in appendices is not necessarily taken into account in the assessment.
The progress report is likely to be shorter, usually no more than 20 pages.

Format: 12 point font, 3.5cm left margin (to allow room for binding), 2.5cm margins on top, bottom and right side, one and a half (1.5) line spacing, printed only on one side.

Suggested Layout

- acknowledgements
- executive summary : using between half a page to a page, give a concise summary of the project aims, background, general approach and key results
- table of contents. A Chapter/Section/Subsection numbering scheme must be used and thus Section 4.3 will be the third section in the fourth Chapter. Chapter 1 is normally the introduction. Pages must be numbered and the page numbering should start from page 1 as the first page of the Introduction
- list of figures (optional)
- list of tables (optional)
- introduction: This contains the aims/objectives, background to project, requirements/specifications, results from a literature survey, system block diagram and details of the work split between different group members. This can often come largely from the project proposal.
- several chapters covering your technical contributions to the report, describing
    - the analysis methods and simulations if appropriate
    - the method used to solve the problems
    - the implementation and system integration if appropriate
    - the experimental testing and results if appropriate
- project management description : timeline, key milestones, budget, discussion of any differences between the project execution and the original plan due to aspects such as technical difficulties/changes in project aims, discussion of other project management issues faced and how they were overcome.
- conclusions: summary of key results from the project, possible future work, advice to students continuing project (if appropriate)
- references: use of other people's research and work should be acknowledged
- work must be properly and accurately acknowledged. This means including a complete reference list and indicating within the text where use has been made of items in the reference list. A large part of our knowledge is taken as known standard work for which references are not expected - be guided by the actual use you make of published work.
- appendices: These give information which may be useful for reference purposes and may include items like copies of key reference papers, datasheets, experimental data, full circuit diagrams, software listings, detailed analytical derivations, mechanical drawings etc.

General Comments

- the project report will be assessed not only on its technical content, but on its effectiveness in communicating information. The standard of written expression, including sentence construction, grammar, spelling, organisation into paragraphs, as well as the overall arrangement of the subject matter will be taken into account.
- the above information covers general project reports, as each project is different, it is recommended that you discuss the particular reporting requirements of your project with your supervisor. It is often helpful for you to draft out a table of contents showing the chapter titles and sections and check this with your supervisor.
- the captions for figures should be placed below the figure and the captions for tables should be placed above the table.
- a label at the centre of the front cover should give the title of the report, the author's name, the commencement date and the submission date.
- check with your supervisor for their requirements for binding the report. The normal suggested binding method is described as follows : A4 size board covers are placed on the front and back of the report. A spine label is produced from white card about 50mm by 300mm which can be folded to form a channel that fits the spine. The author's surname and project title (abbreviated if necessary) is printed along the space between the two folds that define the spine proper. This channel can then be placed over the left-hand edge of the report and the whole bound between the covers by three staples 12mm from the edge. Orientate the spine so that it reads from top to bottom.
- the detailed assessment criteria used for the project report are available on the final year website.

Assessment Cover Sheet

The assessment cover sheet must be signed and included with your Report and submitted to your supervisor.

11. Guidelines for the Final Seminar

SEMINAR TIMETABLE

The final seminar for all projects will be presented on one day, in the first week of the semester 2 mid-semester break. A timetable will be published early in semester 2. All students are expected to attend all seminars in their scheduled stream..

SUGGESTED TIME ALLOCATION

Group Size (students)	Presentation Time Per Speaker	Discussion Time	Demonstration Time	Total Presentation Length
1	20 mins	10 mins	15 mins	45 mins
2	15 mins	10 mins	15 mins	55 mins
3	15 mins	15 mins	20 mins	1hr 20 mins
4	15 mins	15 mins	20 mins	1hr 35 mins
5	15 mins	15 mins	20 mins	1hr 50 mins

PRESENTATION INFORMATION

A suggested time allocation is shown in the table above. This can be varied as long as the group adheres to the total presentation time and that each student provides an adequate contribution to allow individual assessment of presentation skills. Students will be assessed for their time management during the seminar.

Sessions should start and finish on time as staff have to move between streams, but sessions should not start until staff are present.

The project supervisor will chair the presentation session. They will introduce the group, ensure that speakers do not go substantially beyond the allotted timing, call for questions and ensure that seminars finish on time.

It is preferable that each group member speak on only one occasion. This produces a smoother presentation.

For demonstrations outside the seminar room, please allow time for movement to and from the demonstration location. With the approval of the project supervisor, the demonstration can be omitted if it is not appropriate for the particular project.

FACILITIES AND BOOKING

Digital projectors will be available for use at each of the seminars. If you have any requirements apart from a basic Powerpoint presentation please see the Laboratory Manager as soon as possible and at least a week before your presentation.

It is assumed that you are familiar with the use of the digital projectors from your proposal seminar earlier this year and so no practice sessions with the projectors will be provided. The projectors will however be generally available an hour before each presentation session so that the groups in that session can load their presentations on to the computer and refamiliarise themselves with the hardware. Note that the seminar rooms will normally be locked, please see the Laboratory Manager to gain access. If he is not available see the Storeman or the School office.

Note that the available hardware can limit the data projector's screen resolution to 640x480 pixels. It is recommended that you verify your presentation is still clear at this resolution by testing it on a computer with the screen set to the same resolution.

We will be aiming to provide network access in all the seminar rooms however it is recommended that you bring a copy of your presentation on disk as a back-up.

Please follow the instructions on the digital projectors for turning them on and off. If these instructions are not followed, the projector lamp could be damaged and the projector may not be available for use for later seminars. If you have any questions about the use of these projectors please see the Laboratory Manager.

As a general rule, the number of slides should not exceed the number of minutes allotted for presentation. Each group should provide a copy of their presentation (printed six slides per page) to their supervisor and the moderator at the start of the presentation.

> The scheduling for seminars is usually very tight, with other students and staff often having commitments immediately before and after the seminar. It is a matter of professional courtesy to not use up more of other people's time than they have been asked to commit. It is therefore very important that your seminar starts on time and that you do not run overtime. Any significant deviations from your allocated time will be penalised.

ASSESSMENT

Two staff members will be present for each seminar: the supervisor and ether the co-supervisor or an independent assessor. The seminar assessment will be performed using a rubric similar to the example shown in Appendix F. A copy will be provide to you well before your seminar.

GENERAL INFORMATION

The seminar should be aimed at a general electrical engineering audience (that is, your fellow students) who have no specialist knowledge of your topic area. You should provide a clear explanation about the background, nature, scope and aims of the project. Various aspects can then be described concisely and the results of the investigation presented. Even distribution of load, logical order of presentation and cohesion are part of the assessment criteria. Careful preparation will be necessary to ensure that this is successfully achieved in the time allocated.

12. Guidelines for the Project Exhibition

To be supplied.

13. Appendix A: Meeting Timetables

THE UNIVERSITY OF ADELAIDE
AUSTRALIA

School of Electrical and Electronic Engineering

Final Year Student Project Groups

Available Meeting Timetable

Semester 1

Year: _____

Semester: _____

Rough Project Title: _____

Name: _____Student ID_____

Email: _____

Mobile (optional) _____

Please cross out (use "X") the times which you are NOT available for meetings.

	Monday	Tuesday	Wednesday	Thursday	Friday
9:10-10am					
10:10-11am					
11:10-12am					
12:10-1pm					
1:10-2pm					
2:10-3pm					
3:10-4pm					
4:10-5pm					

School of Electrical and
Electronic Engineering

Final Year Student Project Groups

Available Meeting Timetable

Semester 2

Year: _____

Semester: _____

Rough Project Title: _____

Name: _____Student ID:_____

Email: _____

Mobile (optional) _____

Please cross out (use "X") the times which you are NOT available for meetings.

	Monday	Tuesday	Wednesday	Thursday	Friday
9:10-10am					
10:10-11am					
11:10-12am					
12:10-1pm					
1:10-2pm					
2:10-3pm					
3:10-4pm					
4:10-5pm					

14. Appendix B: Laboratory Rules A

Laboratory Rules A

THE UNIVERSITY OF ADELAIDE AUSTRALIA

School of Electrical & Electronic Engineering

And rules applicable to all students working in this School.

*NOTE: For experiments conducted in the Power Laboratories, **"Laboratory Rules B"** also apply.*

The attention of all students is also drawn to the University of Adelaide Rules for Student Conduct http://www.adelaide.edu.au/policies/33/.

1. No student will be permitted to perform a practical unless he/she has provided evidence of adequate preparation for the practical according to the written specifications provided. Failure to produce such evidence will result in automatic preclusion from the practical session.
2. The Head of School may exclude any student from any laboratory program for any cause deemed sufficient and shall report every such exclusion, and the grounds for it, to the Executive Dean. The Dean may reverse, vary or confirm the exclusion upon such terms as he/she shall think fit.
3. For students taking regular courses involving laboratory work in the School an appropriate laboratory will be open daily during term time (weekends and holidays excepted) at such hours as shall be considered necessary by the head of the School concerned. Persons engaged in advanced work or research may work at such additional times as the head of the School may arrange. Undergraduate students will not be permitted in laboratories or work areas outside scheduled timetabled times.
4. Whenever necessary and possible, each student will have a definite working place assigned, which may not be changed without permission. To avoid congestion or disruption, students must not move about the laboratories unnecessarily or make undue noise.
5. Paper and refuse of any kind must be placed in the receptacles provided for the purpose. No solid material of any kind shall be thrown into sinks.
6. Students are responsible for the cleanliness of their apparatus and work places or benches, which must be left clean and tidy after each practical session. Equipment and apparatus put out for student use should not normally be put away in the cupboards by students. Bags are to be stowed under benches or in nominated areas. Aisles are to be kept free from obstructions.
7. All preparations and equipment made from materials supplied by the School shall remain the property of the School.
8. Students may be held responsible for damage to equipment and apparatus, on such basis as the head of the School may determine.
9. No experiments of a dangerous nature may be performed in laboratories.
10. Any accident must be reported at once to the person currently in charge of the laboratory
11. The use of floor-level open-bar heaters and floor-level fan-heaters in laboratories is prohibited.
12. Close fitting closed-toe shoes must be worn in workshop and laboratory areas. Shirts that cover the back and shoulders must be worn in workshop and laboratory areas. In particular sandals,

Authorised by Michael Liebelt (Head of School). Version 4.1.2; 21 September, 2009.
Master: P:\Staff Only\ohs\lab-rules-a.doc; Public: https://www.eleceng.adelaide.edu.au/policies/lab-rules-a.pdf
This document is uncontrolled if printed. Please visit the Master or Public location to view the latest version

thongs, backless or loose fitting shoes, tank tops and sleeveless T-shirts are not permitted. Long hair must be tied back out of the way.

13. Eating, drinking and smoking are not permitted in laboratories and other places as specified.
14. Any student may be excluded from any laboratory session if deemed to be insufficiently prepared or to have infringed any of the above rules. Any student refusing to obey a reasonable order given by a demonstrator or by a member of staff, in regard to any safety issue or in regard to infringements of any of the above rules, shall be reported to the head of School for possible disciplinary action.
15. Students are reminded that the constraints of Copyright legislation apply to some of the material issued for laboratory work. In the case of computer software it is illegal to make unauthorised copies of proprietary software and illegal to take any such copies of software away from the University. Heavy fines may apply under the relevant legislation.

Soldering Components

If it is ever necessary to solder components onto circuit board you must use the filter units provided and remember that soldering irons are extremely hot and should be treated with due care and attention at all times.

Qualified First Aid Personnel

The qualified first aid personnel in the School are as follows:

Engineering North Ground Floor	Workshop Supervisor (NG07)	Tel. 35301
Engineering North 1st Floor	Laboratory Manager (N129)	Tel. 35467
Engineering North 2nd Floor	Computing Services Technician (N227)	Tel. 35749
Engineering Maths. 2nd and 3rd Floor	Head Demonstrator/Tutor (EM311)	Tel. 36424

Evacuation Procedure

On hearing the evacuation signal please leave the building in an orderly manner and assemble at the designated assembly point.

Under no conditions must you re-enter the building until the chief warden informs you that it is safe to do so.

Mr M. J. Liebelt

Head of School

15. Appendix C: Laboratory Rules B

Laboratory Rules B

THE UNIVERSITY OF ADELAIDE AUSTRALIA

School of Electrical & Electronic Engineering

Safe Conduct of Experimental Work in Junior Machines Lab NG06, and Power Projects Labs NG08 and NG24

NOTE: These rules are in addition to 'Laboratory Rules–A' which also apply in power laboratories.

These laboratories pose special safety problems because of the electrical hazards associated with 415 volt, 3-phase A.C. and 220 volt D.C. power supplies and the mechanical hazards associated with rotating machinery. Because of these hazards, each user of these laboratories must be familiar with the following procedures, which must be adhered to under all circumstances. Failure to follow these procedures or any action likely to cause injury to self or others will result in the exclusion of the person/persons involved from the remainder of the laboratory session.

1. No student will be permitted to perform a practical in the power laboratories unless he/she has attended the pre–practical tutorial for that practical. Non-attendance at the prepractical tutorial means automatic preclusion from the practical session.
2. Workstations in the laboratories shall be energised only when specific tests are to be performed, and, in the case of laboratory NG06, only after the circuit the demonstrator has checked connections. The workstation should be de-energised immediately after the tests have been completed. Workstations must not be left unattended while energised.
3. Circuit wiring must never be altered while the switchboard is live or while a machine set is rotating. This also applies to checking the tightness of terminal connections and reversing the connections to measuring instruments. All such adjustments must be made with the switchboard dead and the machine set stationary.
4. It is occasionally necessary to use portable switches. On these occasions the pole change contactor should be used and it is essential that, before using it, its operation and correct use be understood.
5. When portable instruments (such as multimeters) are used to monitor the voltage at various points in the circuit while it is energised, special–purpose insulated probes must be used.
6. The guards around the shaft couplings on the machine sets must always be in position when the sets are rotating. If a guard is removed for any reason then it is the responsibility of the student/students concerned to ensure it has been replaced after the test or before leaving the laboratory.
7. Watches with metal bands, bracelets, earrings and finger rings are not permitted to be worn in these laboratories.
8. Close-fitting, closed-toe shoes must be worn in workshop and laboratory areas. Shirts that cover the back and shoulders must be worn in workshop and laboratory areas. In particular sandals, thongs, backless or loose fitting shoes, tank tops and sleeveless T-shirts are not

Authorised by Michael Liebelt (Head of School). Version 4.1.1; 21 September, 2009.
Master: F:\Staff Only\ohs\lab-rules-b.doc; Public: https://www.eleceng.adelaide.edu.au/policies/lab-rules-b.pdf
This document is uncontrolled if printed. Please visit the Master or Public location to view the latest version

permitted. Long hair must be tied back out of the way. It is recommended that long trousers and long sleeved shirts be worn.

9. All injuries sustained while working in laboratory NG06 must be reported immediately to the demonstrator who will take appropriate action and make out an incident report if necessary.
10. Demonstrators must be present at all times in lab NG06. If they need to leave the lab for short periods, a workshop staff member will be present.

In addition, the following rules apply to the Power Projects labs NG08 and NG24.

11. Prior to using workbenches and equipment in these labs, all students must attend a CPR (resuscitation) demonstration. In addition each student must complete a lab induction procedure to the satisfaction of the workshop supervisor.
12. Work in these laboratories is to be carried out only during normal hours ie. 9am-1pm, 2pm-5pm.
13. If no member of the workshop is present in the workshop NG07, students will be advised that the staff will switch off high voltage supplies; students may only use the general-purpose outlets for powering both instruments and low voltage electronic circuits.
14. Equipment in the Power Project Labs must not be removed from the lab without the permission of the workshop supervisor.

Warning

It must be remembered at all times that the simultaneous touching of live terminals and earth is potentially fatal. There are large areas of earthed metal present – the frames of the rotating machines, the induction motor starter and the switchboard facia; a coat of paint on these does not constitute adequate insulation.

All incidents of electric shock or suspected electric shock must be reported to the demonstrator or workshop supervisor immediately.

Qualified First Aid Personnel

The qualified first aid personnel in the School are as follows:

Engineering North Ground Floor	Workshop Supervisor (NG07)	Tel. 35301
Engineering North 1st Floor	Laboratory Manager (N129)	Tel. 35467
Engineering North 2nd Floor	Computing Services Technician (N227)	Tel. 35749
Engineering Maths. 2nd and 3rd Floor	Head Demonstrator/Tutor (EM311)	Tel. 36424

Evacuation Procedure

On hearing the evacuation signal please leave the building in an orderly manner and assemble at the designated assembly point.

Under no conditions must you re-enter the building until the chief warden informs you that it is safe to do so.

Mr. M. J. Liebelt

Head of School

16. Appendix D: Power Project Laboratory Induction Procedures

SUMMARY OF LABORATORY RULES

The rules that apply in the power laboratories are as follows:

- Eating, drinking, open toe shoes, conductive jewellery, untied long hair, boisterous behaviour will not be permitted in the laboratories.
- Use of three-phase and DC power is only permitted when there are workshop staff within the workshop and surrounding areas. After hours access to the power laboratory is not permitted.
- Use of three-phase and DC power may only be commenced after successful completion of the CPR training and induction procedures supplied by the School, or by proving sufficient knowledge of current first aid procedures or by having a current senior First Aid Certificate
- Report the loss or failure of any equipment immediately to the Workshop Supervisor

Infringement of these rules *will* result in *expulsion* from the Laboratory.

SAFETY

Always think SAFETY FIRST. If you are unsure about anything please consult the workshop staff. You will find them easy to talk to and happy to assist or advise you.

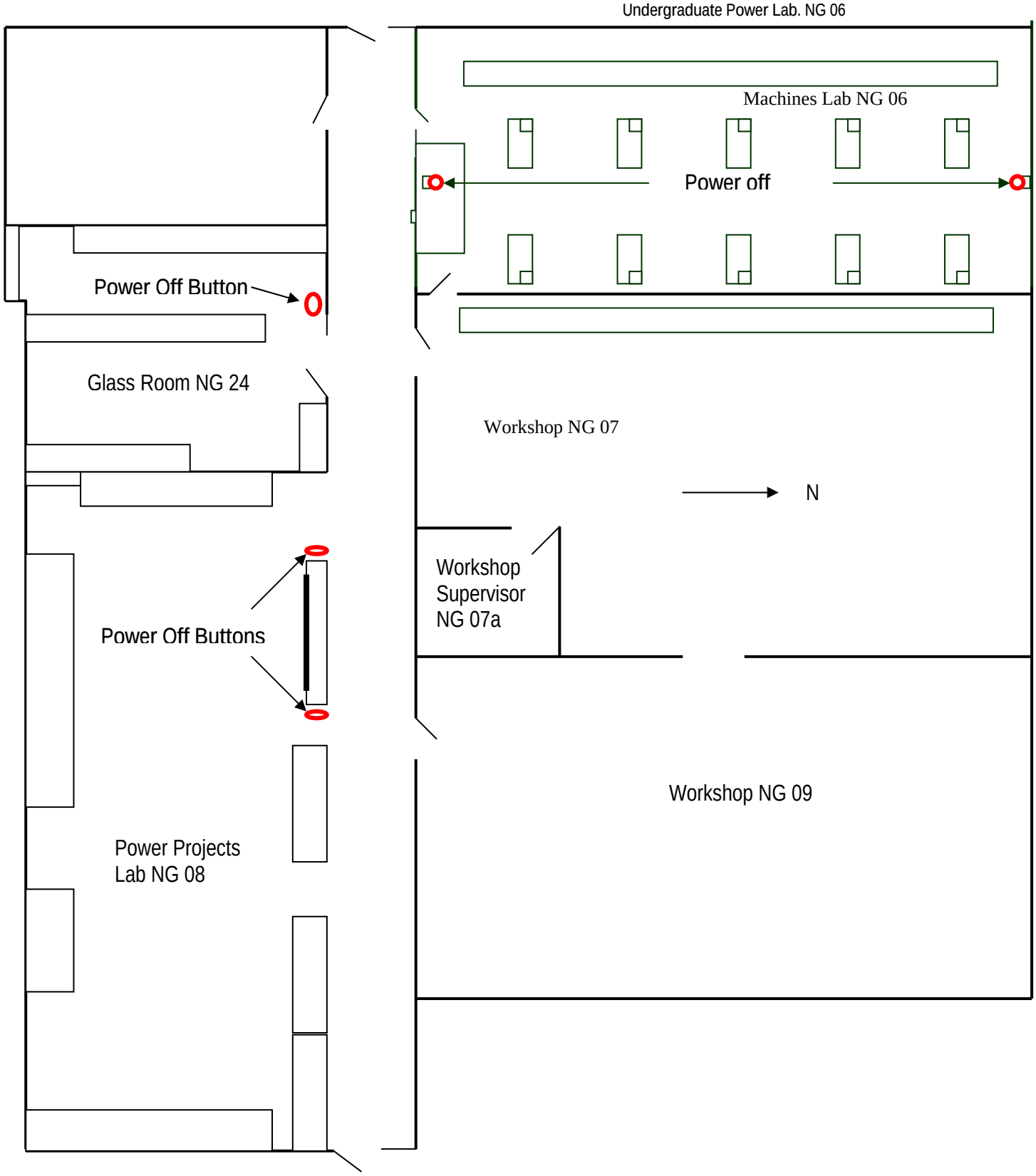
You MUST report any incidence of electrical shock to the Workshop Supervisor immediately. This helps us to improve our safety system, and is required by State Law.

Safety Hints

- Treat electricity as an invisible predator ready to pounce at any given opportunity.
- When wiring high voltage circuits, ensure all power supplies are switched off as a safety precaution. Keep one hand in your pocket or behind your back. In the event of a shock this may prevent current from passing across your chest and affecting your heart.
- Even when circuits are not energised always hold a connecting lead by the insulation. Never touch the metal lug exposed at the end of the lead.
- Make sure that you touch only the insulated part of a terminal post when connecting a lead to it.
- Highly inductive loads will generate very large voltages if the circuit is momentarily broken. Double check all terminals are tight and wiring is good before energising any circuit.

1. Power Isolation (Emergency off Buttons)

Emergency Power Isolation buttons are present in the power Laboratories. You must be familiar with their position within all these Laboratories. They are large RED mushroom shaped buttons that are pressed OFF. This will cut all power.

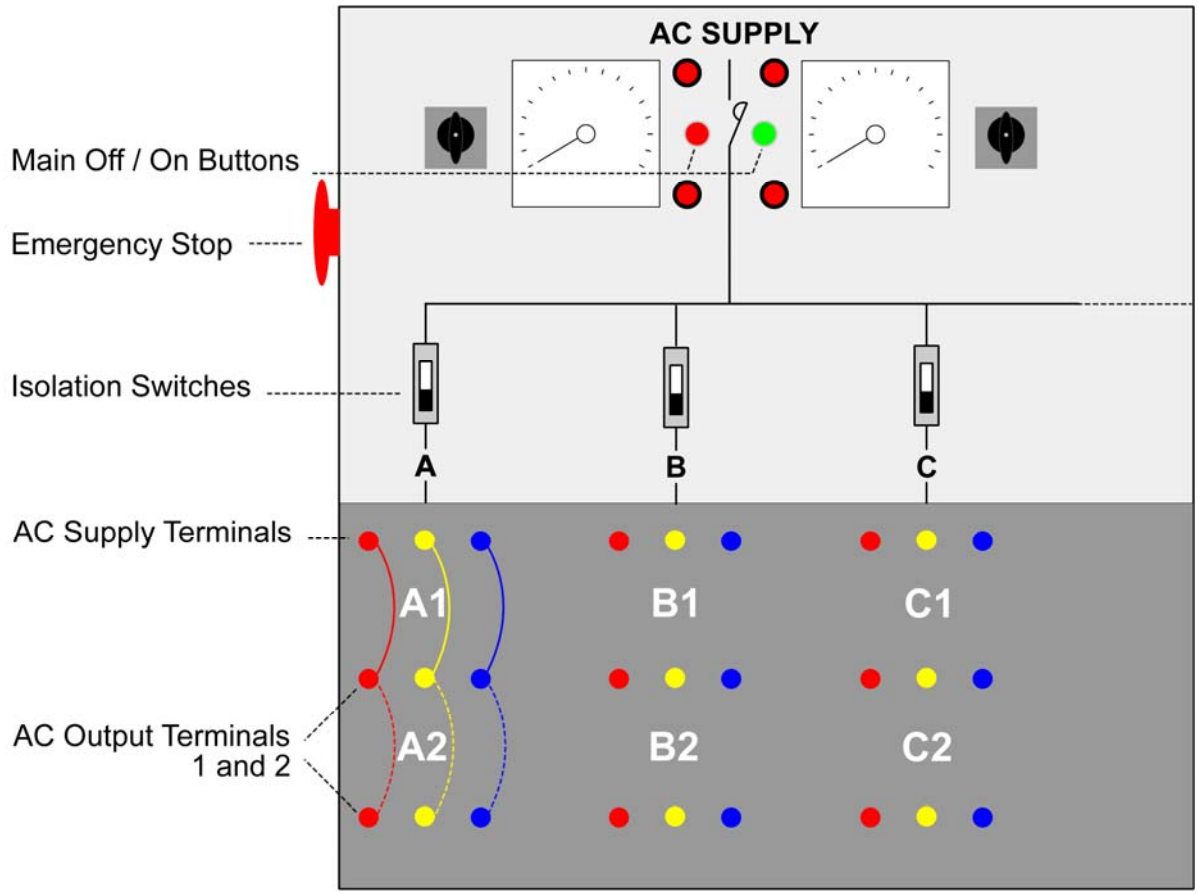


2. Switching on the power to the main switchboard.

Before switching on AC or DC power to the main Switchboard, you must ensure the supplies to other stations on the main switchboard are switched off. Other users may have neglected to switch off the supplies to their work benches before leaving the lab. Exposed terminals may become live on unoccupied benches creating a hazard for technical staff and other students.

3. Wiring the main switchboard to supply your workstation with three-phase AC power.

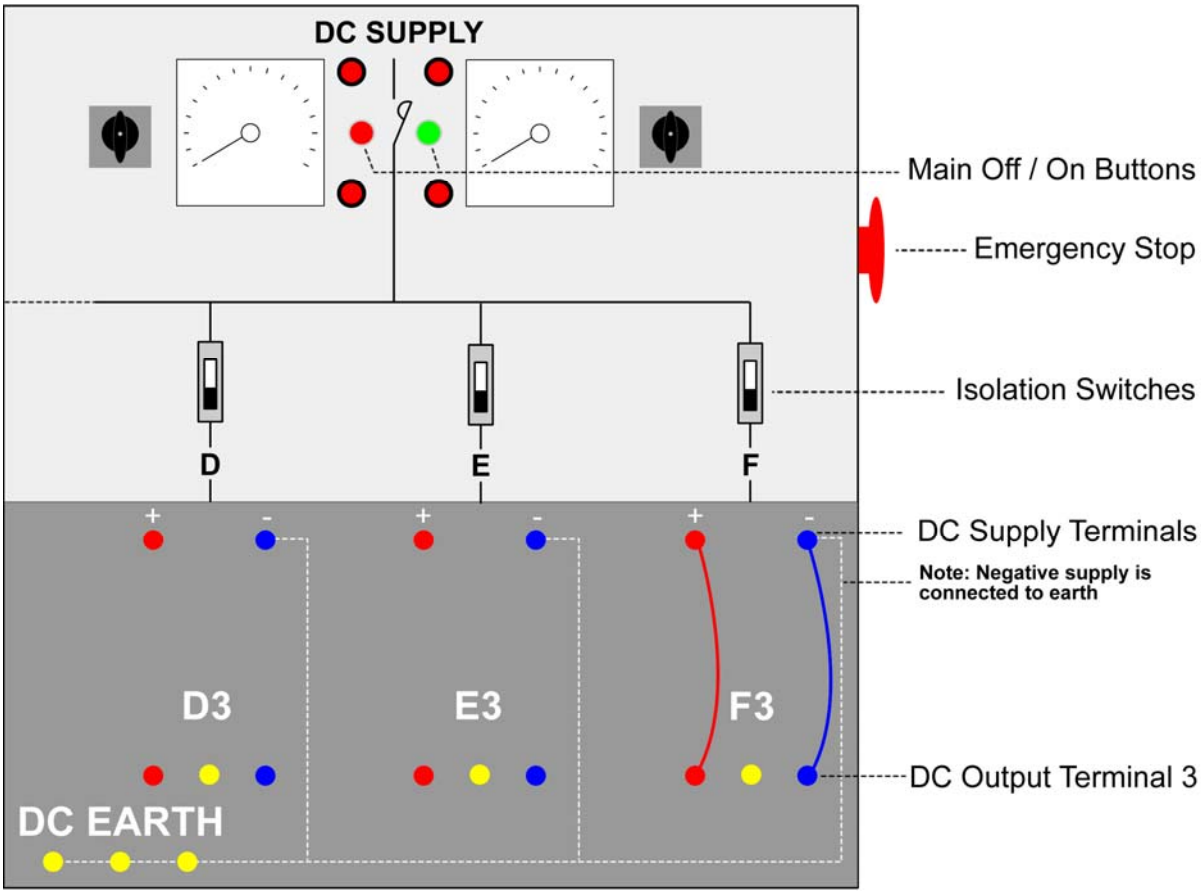
Your workstation has nine terminals assigned to it on the main switchboard. The upper terminals, (Red ,White & Blue), are your source of power. They are supplied by the circuit breaker switch above them. Before wiring the power to your bench, ensure the circuit breaker is switched off.
To connect power to your bench terminals a wire lead must be connected between the source terminals and the lower sets of terminals of the same colour. There are two sets of lower terminals that correspond to the labelling on your bench. Only wire those terminals you require.



4. Wiring the main switchboard to supply your workstation with DC power.

Your workstation has five terminals assigned to it on the main switchboard. The upper two terminals (Red & Blue) are your source of power. They are switched by the circuit breaker above them. Ensure the circuit breaker is switched off before wiring the bench.

The bottom three terminals (Red, Yellow and Blue) are connected directly to your bench. Wire the corresponding colours together.
Note: The DC supply provides +220 volts with reference to the negative terminal, which is earthed to ground However do not treat the negative terminal as a substitute for ground. Voltage drops will occur at high current load, raising the potential above true earth.



BEWARE:

Each incoming line from the DC switchboard to your bench is fused and has its own switch on your bench. You MUST NOT disable your load by opening the negative terminal switch with the positive terminal switch still closed; all your bench wiring will still be *alive* at +220 V DC.

5. Activation of General Power Outlets

General power outlets (GPO's) on all benches are activated by one switch labelled GPO'S on the main switchboard only. No extra wiring is necessary. All points are earth leakage protected.

6. Laboratory Equipment

Typical lab. equipment is housed in NG 08 (Glass cabinet). This is for use in the Power Labs only. You do not need to book items out when you transport them to your bench. Transporting of equipment to other areas, or loan of items to other students is **expressly prohibited** without the Workshop Supervisor's permission.

'Variacs' are **extremely** hazardous and must be obtained through the Workshop Supervisor.
3 Phase Variac wiring must be checked by the Workshop supervisor or supervising academic before energising.

Wire leads, probes and cables are housed in the two cabinets in the corner of NG 08. Please keep these cupboards tidy by replacing unwanted leads in the appropriate rack. You can manufacture special cables with technical staff guidance.

Valuable equipment will be secured to your work-station by high tensile cables and padlocks. These are available from the final year store.

7. Use of Workshop facilities.

Students may use workshop facilities if deemed capable of doing so by the Workshop Supervisor. You must undergo an assessment, or training on each of the machines you want to use. A record of this will be kept and can be upgraded at any time. See the 'Workshop Induction' document for more details, or contact the Workshop Supervisor.

8. Leaving the Laboratory

*Before leaving the laboratory, **ensure all power at your bench is turned off**. Computers must be shut down or you will return to find it has been switched off and data has been lost. Technical Staff will not be responsible for your loss.*

The last person **LEAVING** the lab must switch off the AC and DC supplies.

When leaving the lab temporarily, store your bag out of sight or ask the Workshop Supervisor if you can leave it in his office.

The Workshop staff, Academics or the Department will not take responsibility for the loss of your effects.

Ian Linke
Workshop Supervisor

17. Appendix E: Power Laboratory Induction Procedure Disclaimer

Power Laboratory Induction Procedure Disclaimer

THE UNIVERSITY OF ADELAIDE AUSTRALIA

School of Electrical & Electronic Engineering

Electronic Engineering

Student Copy

I the undersigned have been inducted into the Power Laboratory according to the provided procedure and will abide by the rules of its operation.

Student Name:

……

Student Signature: ……..

Assessor: ……

Workshop Supervisor: ... Ian Linke ……

Signature: ……

Date: ……. / …….. / ……..

Power Laboratory Induction Procedure Disclaimer

THE UNIVERSITY OF ADELAIDE AUSTRALIA

School of Electrical & Electronic Engineering

Staff Copy

I the undersigned have been inducted into the Power Laboratory according to the provided procedure and will abide by the rules of its operation.

Student Name: ……..

Student Signature: ……..

Assessor: ……

Workshop Supervisor: ... Ian Linke ……..

Signature: ……

Date: ……. / …….. / ……..

18. Appendix F: Assessment Rubrics

Final year project assessment rubric for: Proposal Seminar

Level of Achievement

	Facet of Achievement	Level 1 *Students operate in **closed inquiry*** / achieves a **minimal number of objectives***	Level 2 *Students operate in **closed inquiry*** / achieves **some of the objectives***	Level 3 *Students operate in **closed inquiry*** **independently** / achieves a **majority of the original set of objectives***	Level 4 *Students operate in **open inquiry*** / achieves the **original set of objectives***	Level 5 *Students operate in **open inquiry*** / achieves beyond the **original set of objectives***
Technical	*A. Students embark on **inquiry*** and so determine a need for knowledge / understanding (10%)*	☐ Objectives not clearly stated or inappropriate ☐ Background & relevant works minimally surveyed	☐ Objectives present but not clear, focussed or made explicit ☐ Background & relevant works superficially surveyed	☐ Objectives clearly stated, remain within supervisor guidelines ☐ Background & relevant works suitably surveyed	☐ Objectives clear, focussed and innovative, remains within supervisor guidelines ☐ Background & relevant works broadly surveyed	☐ Objectives clear, focussed and innovative, extending past, but in keeping with, supervisor guidelines ☐ Background & relevant works broadly surveyed & analysed
Technical	*B. Students find/generate needed information / data / ideas using appropriate approach / method (15%)*	☐ Some key technical challenges vaguely identified ☐ Invalid or no technical reasoning	☐ Some key technical challenges clearly identified ☐ Little valid technical reasoning	☐ Most key technical challenges clearly identified ☐ Some valid technical reasoning	☐ All key technical challenges clearly identified ☐ Comprehensive & valid technical reasoning i	☐ All key technical challenges comprehensively identified ☐ Comprehensive , succinct & valid technical reasoning
Technical	*C. Students **critically evaluate** information / data / ideas, their approach and results, **and** react appropriately (25%)*	☐ Limited critical evaluation of information / data / ideas ☐ Proposed work's significance, strengths and weaknesses minimally addressed	☐ Some critical evaluation of information / data / ideas ☐ Proposed work's significance, strengths and weaknesses partially addressed	☐ Sufficient critical evaluation of information / data / ideas ☐ Proposed work's significance, strengths and weaknesses clearly addressed	☐ Ample critical evaluation of information / data / ideas ☐ Proposed work's significance, strengths and weaknesses comprehensively addressed	☐ Abundant critical evaluation of information / data / ideas ☐ Proposed work's significance, strengths and weaknesses comprehensively addressed and circumstantiated
Management	*D. Students **perform necessary** processes to meet stated project objectives (10%)*	☐ No discussions on milestones ☐ Strategy to ensure progress is minimally stated	☐ Brief discussions on milestones ☐ Strategy to ensure progress is stated but inadequately explained	☐ Sufficiently detailed discussions on milestones ☐ Strategy to ensure progress is stated and adequately explained	☐ Detailed discussions on milestones ☐ Strategy to ensure progress is stated and well articulated	☐ Detailed and succinct discussions on milestones ☐ Strategy to ensure progress is stated, well articulated and innovative
Management	*E. Students **organize themselves** effectively and adequately manage human input to project (10%)*	☐ Allocation of group roles to manage workload is minimally outlined ☐ No specification of a team approach to reviewing and revising group roles	☐ Allocation of group roles to manage workload is briefly outlined ☐ Little specification of a team approach to reviewing and revising group roles	☐ Allocation of group roles to manage workload is specified ☐ Specification of a team approach to reviewing and revising group roles	☐ Allocation of group roles to manage workload is specified in detail ☐ Specification of a detailed team approach to reviewing and revising group roles	☐ Allocation of group roles to manage workload is specified in detail and its rationale explained ☐ Specification of a detailed, self-auditing team approach to reviewing and revising group roles
Communication	*F. Students **communicate** project objectives, achievements and the process (30%)*	☐ Unengaging seminar presentation, as shown by level of questions / comments / audience absorption ☐ Visual and spoken elements are not at all integrated / effective ☐ Ineffective use of allotted time (incl questions) ☐ Lack of any discussion of project's ethical, social and/or cultural implications	☐ Mildly engaging seminar presentation, as shown by level of questions / comments / audience absorption ☐ Visual and spoken elements are not well integrated /effective ☐ Moderately effective use of allotted time (incl questions) ☐ Limited discussion of project's ethical, social and/or cultural implications	☐ Engaging seminar presentation, as shown by level of questions / comments / audience absorption ☐ Visual and spoken elements are to some extent integrated /effective ☐ Effective use of allotted time (incl questions) ☐ Some discussion of project's ethical, social and/or cultural implications	☐ Strongly engaging seminar presentation, as shown by level of questions / comments / audience absorption ☐ Visual and spoken elements are highly integrated / effective ☐ Highly effective use of allotted time (incl questions) ☐ Comprehensive discussion of project's ethical, social and/or cultural implications	☐ Captivating seminar presentation, as shown by level of questions / comments / audience absorption ☐ Visual and spoken elements are highly integrated / effective and innovative ☐ Innovative and highly effective use of allotted time (incl questions) ☐ Comprehensive & succinct discussion of project's ethical, social and/or cultural implications