THE UNIVERSITY OF ADELAIDE
AUSTRALIA

Final Year Honours and Design Project Handbook

School of Electrical and Electronic Engineering

Contents

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

June 2005

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

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	
February 1st	**Projects open to student for selection .**
Orientation Week	**Student allocation to projects complete**
Week 1	**Project Groups arrange a meeting with their supervisor**
Week 5	**Proposal Seminars**
Week 8	**Critical Design Review**
Week 10	**Submit Peer Review**
Week 12	**Hand in Project Log Book**
2nd Semester	
Week 9 (Thursday 14.00 hrs)	**Final Project Report due**
Week 10	**Final Project Seminars**
Week 12 (Friday)	**Project Exhibition Day**

Important Dates and Deadlines for Supervisors

1st Semester	
Week 1	**Meet project students to discuss project.**
Week 5	**Proposal Seminars**
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Week 10	**Collect Peer Review Report from Students**
Week 12	**Collect Project Log Books and Enter Sem 1 progress mark in spreadsheet**
2nd Semester	
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Exam Period	**Enter complete project marks into spreadsheet**

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School of Electrical and Electronic Engineering

COURSE DESCRIPTION

For Projects Beginning in the 2005 Academic Year

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

Coordinator : Mr. C.A. Green, Room EM311
email: 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.

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. 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 240 hours on your project. 1st Project Semester : week 1 to week 12 (120 hours nominally), 2nd Project Semester : week 1 to week 11 (120 hours nominally).

Project Moderators: a moderator will be assigned to each project. The moderator will share the assessment of the project with the supervisor as shown in the detailed project assessment documentation. They will review the proposal and attend the proposal and final seminars.

Project Schedule: The final year project takes place over two semesters. In the standard format, students do Part A in first semester and Part B in second semester. In the mid-year entry format, students do Part A in second semester and Part B in first semester of the following year.

PHASE	DEADLINE	MARK
FIRST PROJECT SEMESTER		
Project supervisor allocation posted on FY noticeboard in the final year student room EM316	**Monday, week 1**	
Project and group allocation by supervisor	**Week 1**	
Proposal Seminar	**Week 5**	**5%**
Critical Design Review (group mark)	**2pm Monday week 8**	**10%**
Peer Review	**2pm Thursday week 10**	**5%**
End first part of project	**Week 12**	
Project performance assessment by supervisor (based on progress and project workbook)	**Week 12**	**10%**
SECOND PROJECT SEMESTER		

Begin second part of project	**Monday, week 1**	
Final Individual Report*	**2pm, Thursday, week 9**	**20%**
Final Seminar	**Weeks 10 and 11**	**10%**
Project Exhibition	**Week 12**	**5%**
End second part of project	**Week 12**	
Project performance assessment by supervisor and moderator	**Week 12**	**35%**

* These reports should be handed in to the Department 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 Department.

Information Checklist when Starting Your Project (Documents are available on the Project Website)

- Project Startup 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 IT&T 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.

C.A. Green
Project Coordinator
April 2005
Revised Feb. 2007

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

Honours and Design Final Year Project
2007 Final Year Project Assessment

The final year project assessment consists of three parts which will be assessed by the project supervisor and the moderator. The group will receive a single mark for the Critical Design Review but will receive individual marks for all other assessment components.

- Project Performance Assessment
- Final Report Assessment
- Seminars Assessment
- Peer review

The contributions are weighted as follows in which the supervisor is responsible for 75% of the total assessment and the moderator is responsible for 25%.

	Assessment Plan for 2007		
	Supervisor	Moderator	Total
1) Reports *			
Critical Design Review Final	5% 10%	5% 10%	10% 20%
Subtotal	15%	15%	30%
2) Seminars			
Proposal Final	2.5% 5%	2.5% 5%	5% 10%
Subtotal	7.5%	7.5%	15%
3) Project Performance			
Peer review First Semester Overall	5% 10% 35%		5% 10% 35%
Subtotal	50%	0%	50%
4) Exhibition			
Subtotal	5%	0%	5%
TOTAL	77.5%	22.5%	100%

The detailed provisional assessment sheet used by the Department is available on the Project website.

1) Project Performance

The final year project is a miniature version of projects which you may encounter in your working environment. It is opportunity for you to learn new technical skills and also learn to work effectively in a team. Unlike most of your other subjects, the project requires that you use your own initiative. Unlike a laboratory experiment there is no practical worksheet giving

detailed descriptions of each task to be performed. Instead you are required to plan out what is required and then execute it.
The first semester project performance is based on your progress, the meetings with your supervisor and your project workbook. This workbook must be kept up to date and handed in at the end of the first semester and at the conclusion of the project.
Enthusiasm and initiative are important. This is **your** project and you need to take responsibility for it. It is not uncommon that as you progress through the project that you will encounter unexpected difficulties. It is from overcoming these challenges that you will learn the most about research from your project. The methods which you use to solve these problems can form a significant part of your final report and seminar.
When you strike difficulties, the key thing is not to panic. You should assess the issues, develop a plan (and maybe a back-up) and then discuss this with your supervisor. Especially at the later stages of the project, if you feel that you will probably not be able to complete all the objectives, then you should discuss priorities with your supervisor.
Listed below are the factors which will be considered in the project performance assessment: :

1.	Student attributes Commitment Enthusiasm Resourcefulness Persistence Effort Teamwork		30%
2.	Technical merit Research undertaken Accuracy and validity of design Construction or coding skill Experimental records kept in project workbook Testing and troubleshooting Evaluation of outcomes and results		50%
3.	Project management		20%
	a. Project planning, coordination and monitoring (group mark)	10%	
	b. Planning for and recording of meetings (in project workbook)	5%	
	c. Record of time spent and monitoring against plan (in project workbook)	5%	

Remember that the aim of the Project Work course is not simply for you to accomplish all the goals your supervisor has set out for you (though clearly this is important!). The aim is to give you an opportunity to learn and demonstrate key research skills such as self motivation, methodical approach to research, time management and ability to tackle challenging problems. If you demonstrate that you are dedicated and diligent in tackling your project, you should do well even though you may not achieve all the original project goals.

2) Project Report

Listed below are the factors which will be considered in the project report assessment: :

1. Context and objectives The nature of the problem being addressed; the context of the problem; the agreed objectives.	20%
2. Project Management content Recording of: Project specifications; work breakdown; milestones and timeline. Group management practices (meetings, division of work, resolution of problems). Comparison of achievements relative to objectives and explanation of significant variances.	15%
3. Technical content. The recording of Research Designs Implementations Experiments Results and conclusions	50%
4. Presentation Structure and organisation Layout and format Expression, grammar and spelling Appropriate use of diagrams and tables Presentation of diagrams Appropriate length	15%

3) Project Seminars

Listed below are the factors which will be considered in the project seminar assessment :

1. Organisation (Group mark) Logical order Even distribution of load Cohesion Even sharing of questions	10%
2. Presentation Posture, voice clarity and projection, eye contact, engagement with audience Use of aids (Powerpoint, OHP)	35%
3. Technical content. The effective, technically accurate and concise communication of Research Designs Implementations Experiments Results and conclusions as appropriate	35%
4. Question time Confident, relevant, succinct responses to question	10%

5. Demonstration (Group mark) Well prepared Effective Completed within time allowed	10%

C.A. Green, February 2007

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

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://eleceng.adelaide.edu.au/students/undergrad/info/FYPIRequest.html

C.A. Green,
February 2005

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

Honours and Design Final Year Project

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.

C.A. Green, February 2005

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Important Advice for the Start of Your Project

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.

B. J. Phillips
Last Updated June 2005

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

LEVEL IV – HONOURS AND DESIGN PROJECT
Project Work: Proposal Seminars

SEMINAR TIME AND LOCATION

The proposal seminars will take place in week 5 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 the moderator. The seminar assessment will be both on a group and individual basis following the assessment criteria available on the course website. The assessment is performed by agreement between the supervisor and moderator.

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.**

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.

The assessment sheet used is available on the final year project website for your information.

C.A. Green, February 2005

THE UNIVERSITY OF ADELAIDE AUSTRALIA
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HONOURS AND DESIGN PROJECT WORK
GUIDE TO PREPARATION OF FINAL YEAR PROJECT REPORTS

Aims of the Final 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: 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.

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 should be used and thus Section 4.3 will be the third section in the fourth Chapter. Chapter 1 is normally the introduction. 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.

C.A. Green
Final Year Project Coordinator
February 2005

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

LEVEL IV - PROJECT
FINAL SEMINAR PRESENTATION GUIDELINES

SEMINAR TIMETABLE : Please see the seminar timetable (posted on the course website) for the date, time and room of your seminar and to identify which stream it is in. **You are required to attend all the seminars held in the stream in which your seminar is scheduled.** Penalties may apply for non-attendance.

If you are not able to attend a given seminar in your stream due to lecture or tutorial clash you will need to attend another seminar in another stream to make this up. If this is the case please email me on cgreen@eleceng.adelaide.edu.au giving the details of the planned exchange.

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.

An attendance roll will be passed around at each session. The group presenting the seminar is responsible for passing this roll to the next group presenting a seminar in their stream. The last project group in a stream is responsible for returning the roll to the School Office.

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.**

ASSESSMENT

Two staff members will be present for each seminar : the supervisor and the moderator. The seminar assessment will be both on a group and individual basis following the assessment criteria given in the mark sheet available on the course website. The assessment is performed by agreement between the supervisor and moderator.

The seminar assessment sheet used is available on the final year project website for your information.

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.

C.A. Green,
February 2005.

THE UNIVERSITY OF ADELAIDE
AUSTRALIA

School of Electrical and Electronic Engineering

LEVEL IV PROJECT WORK CONTRACT

It is highly desirable for final year project students to be able, where opportunities exist, to undertake supervised projects, which support the ongoing research and development activities of this School. Such projects are by their very nature interesting and challenging and usually reflect the state of the art.

However, in order to serve the best interests of all in the School, to allow the academic staff supervisor freedom in allocating projects and to protect agreements reached with outside bodies, it is requested that each member of the project group completes the following form.

- -

1. I _ understand that the supervised project work I have undertaken may result in the generation of hardware and/or software through the use of University of Adelaide materials, facilities and resources.
2. I clearly understand that except for one copy of the project report for each student approved by the supervisor, no hardware or software material or documentation is to be retained by me or taken out of the School without the express written permission of the School either during or on completion of the project work.
3. I further agree to assign to the School the copyright in any work as part of my Level IV project.

TITLE OF PROJECT: _

_ _

DEGREE: ☐ **EEE** ☐ **CSE** ☐ **Telecoms**
(Please tick appropriate box)

Signed: _

Date: _

Countersigned Supervisor: _

(When signed, please return to the Electrical & Electronic Engineering Office, Room N107)

a/t/l4/sp/commercially sensitive contract:16.9.2002.

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					

Appendices

THE UNIVERSITY OF ADELAIDE AUSTRALIA

School of Electrical and Electronic Engineering

Laboratory Rules –A

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 by-laws made under the University of Adelaide Act Amendment Act, which are published in the University Calendar.

1. No student enrolled in the Bachelor of Engineering EEE, CSE or TELECOMS degrees 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 the 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 Council through the Chairman of the Board of Discipline. The Council may reverse, vary or confirm the exclusion upon such terms as it shall think fit. The fees paid by any student so excluded shall not be refunded unless the Council shall otherwise determine.
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, 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 (NGO7)	tel. 35301
Engineering North 1st Floor	Laboratory Manager (N129)	tel. 35467
Engineering North 2nd Floor	Computing Services Technician (N227)	tel. 35749
Engineering Maths. 2nd, 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
February 7, 2000
Admin\dept_com\dmanual\labA&B
AMP: jkp
Rev. July 5 2000 MJG & CAG
Rev. May13 2001 MJG & CAG
Rev Feb 21 2002 MJG & CAG

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

LABORATORY RULES –B

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 enrolled in the Bachelor of Engineering EEE, CSE or TELECOMS degrees 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 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 i.e. 9am -1pm, 2pm - 5pm.

13. If no member of the workshop is present in the workshop NG09, 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 (NGO7)	tel. 35301
Engineering North 1st Floor	Laboratory Manager (N129)	tel. 35467
Engineering North 2nd Floor	Computing Services Technician (N227) tel. 35749	
Engineering Maths. 2nd, 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
February 7, 2000
admin\dept_com\dmanual\labA&B/ Rev Feb 21 2002 MJG & CAG

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

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 JEWELRY, 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** SUCESSFUL COMPLETION OF THE **CPR TRAINING** AND **INDUCTION** PROCEDURES SUPPLIED BY THE SCHOOL
- 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.

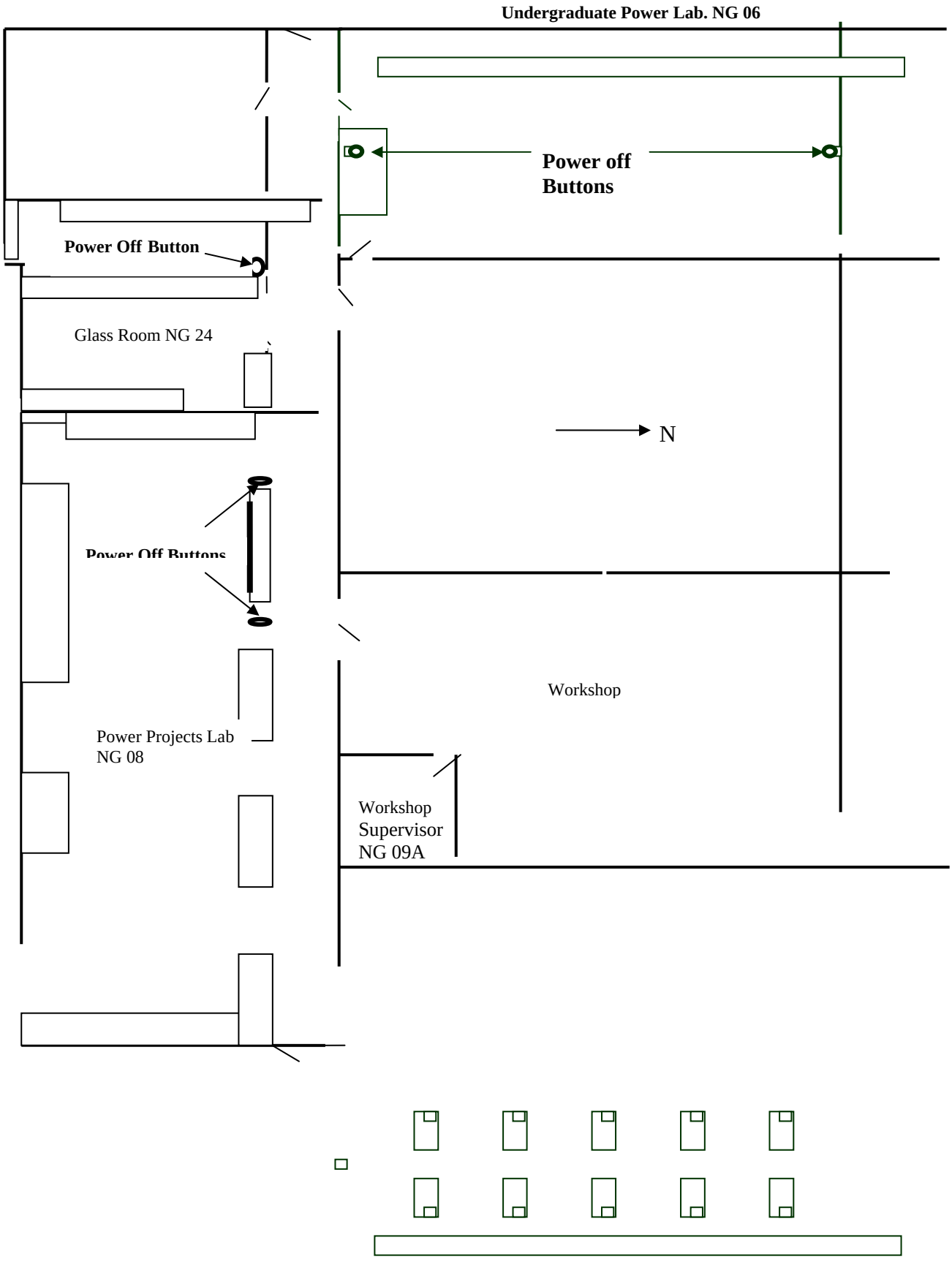
Please report any incidence of electrical shock to the Workshop Supervisor immediately. This helps us to improve our safety system.

Safety Hints:

- When wiring high voltage circuits, make sure all power supplies are switched off as a safety precaution. Keep your **left hand in your pocket** or behind your back. In the event of a shock this will prevent current from passing across your chest and stopping your heart.
- 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.
- Treat electricity as an **invisible predator** ready to pounce at any given opportunity.

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.


Undergraduate Power Lab. NG 06
Power off Buttons
Power Off Button
Glass Room NG 24
N
Power Off Buttons
Workshop
Power Projects Lab NG 08
Workshop Supervisor NG 09A

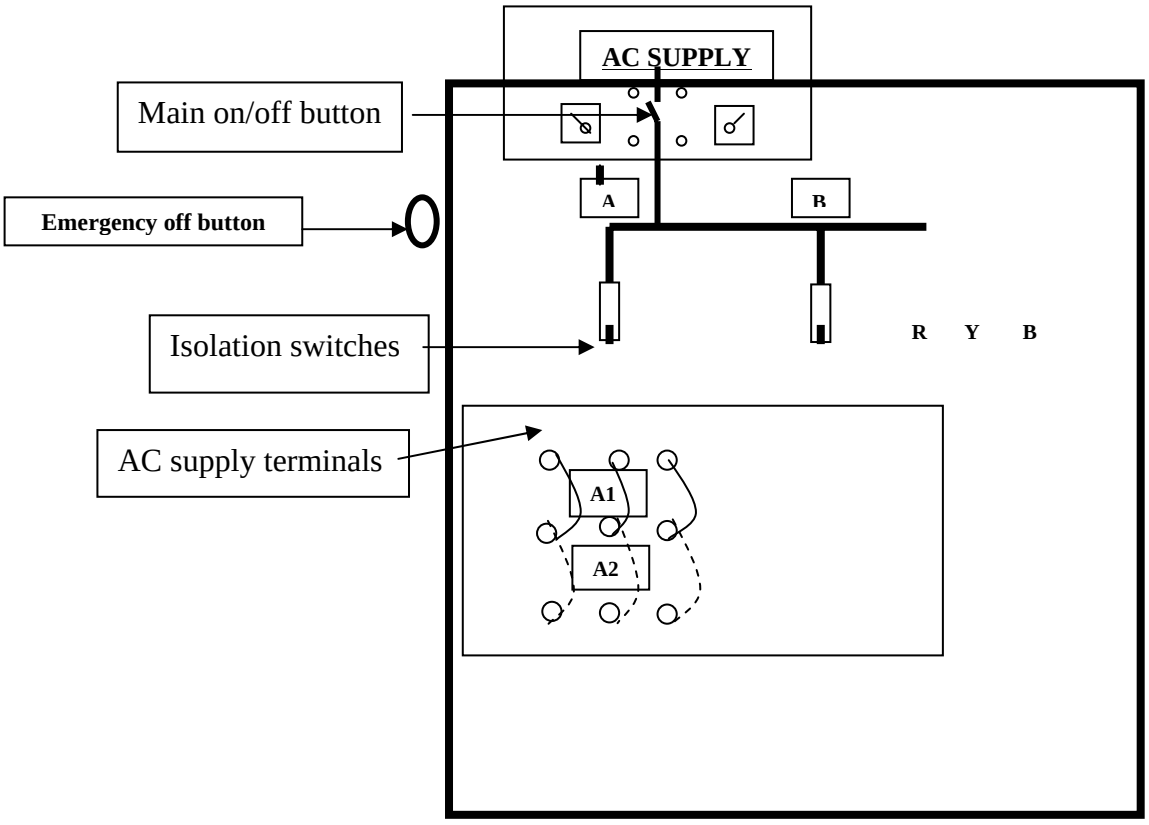
2. Switching on the power to the main switchboard.

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 3-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. The circuit breaker switch above them supplies 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 that you require**

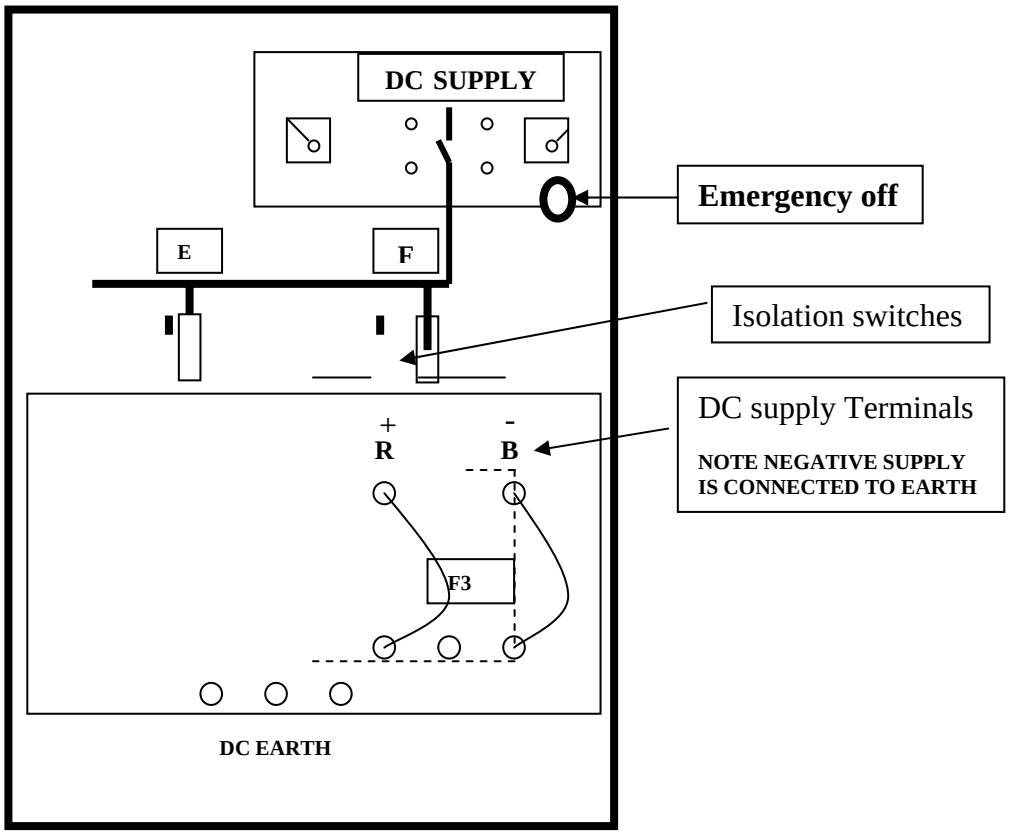


4. Wiring the main Switchboard to supply your workstation with DC Power

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: there is only +220 volts with reference to the negative terminal on the DC supply, which is earthed to ground.



BEWARE.

Each incoming line from the DC switchboard to your bench is fused and has its own switch on your bench. You can 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 24 (Glass room). 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.

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 workstation 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.

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 School will not take responsibility for the loss of your effects.

Ian Linke
Workshop Supervisor
Update 3/10/2001

M.J. Liebelt
Head of School.
03/10/2001

THE UNIVERSITY OF ADELAIDE AUSTRALIA
School of Electrical and Electronic Engineering

DECLARATION

Power Project Laboratory Induction Procedures

Student copy

These procedures have been demonstrated to me. I have understood and will abide by them.

Student Name (print)---------- Signature----------

Workshop staff member----------Signature----------

DATE----/-----/-----

Cut----------

DECLARATION

Power Project Laboratory Induction Procedures

Staff copy

These procedures have been demonstrated to me. I have understood and will abide by them.

Student Name (print)---------- Signature----------

Workshop staff member----------Signature----------

DATE----/-----/-----