1 Introduction.

Students enrolled in B Eng(Electrical), and B Eng(Telecommunications) programs are required to undertake a major project. The project is completed over three Blocks and comprises two academic courses, ELEC4840A and ELEC4840B. The course structure and assessment process is outlined in Section 6.

Conducting a professional engineering or research-based project assists students to develop professional engineering skills by:

- Problem formulation and evaluation skills Giving students experience in project planning and project management
- Demonstrating a practical application from fundamental engineering science and mathematics
- Integrating knowledge and skills gained from coursework studies through the Electrical, and/or Telecommunications Engineering degree
- Developing the ability to think laterally across subject areas
- Encouraging creativity in the formulation of solutions to problems posed by the project
- Enhancing student’s information technology and communication skills through advanced literature searching, formal oral presentations, contact with academic advisors (and in some cases industry supervisors), interaction with technical staff, and the preparation of written reports.
- Reinforcing respect for the profession and ethical standards by the preparation of high quality progress and final reports. Understanding University Policy on referencing and plagiarism is expected.

2 What constitutes a Final Year Project?

The projects undertaken vary widely in their subject matter and scope. They range from academic research topics to industrial projects. It is envisaged that a majority of the projects undertaken by PSB students will be industrially based. Some of these will be within the students own workplace, some will be negotiated by students with local industry, and others will be canvassed and organised by the PSB coordinator. These projects organised by PSB and The University of Newcastle will be predominately team projects designed for up to 3 students per project team. All projects proposed by students must be approved by the PSB Coordinator (for resource requirements) and the Course Coordinator (for academic content and scope).
2.1 What can projects be based on?

Projects may be based on:

- The detailed design of an engineering component
- The design of a more complex system
- Development, construction and testing of the electrical performance of a component or system computer simulation
- Research into an industrially relevant phenomenon
- Theoretical consideration and evaluation of a new process or procedure
- Research that is of largely academic interest at this time

2.2 Material not considered suitable for projects

- Projects already completed or well under way before commencement of the courses
- Work that is to be conducted largely by others and merely recorded by the student
- Work that is largely administrative i.e. has low technical content
- Projects that do not address a majority of the goals laid out in Section 1.0 above
- Projects that are considered beyond the capacity of the student(s) to complete in the time available
- Projects that are considered insubstantial for 30 units of coursework

3 How to Find a Project

Since the kind of project undertaken is very diverse, there are a number of ways to find a suitable project including:

- Approaching your employer with an idea related to an aspect of your own work or their operations in general. (It must be clearly stated what the academic content of the project is as this is likely to differ from the workplace outcomes. A proposal must be presented by the due date of project preferences)
- In consultation with PSB and University staff, developing an idea based upon an interest of your own.
- Consulting the list of Final Year Projects provided by the Course Coordinator.

If the projects origins are not from the Final Year Project List, then a project proposal is required. Guidelines for writing this proposal can be obtained from the Newcastle Final Year Project Website under “Resources”.


4 Group Projects

Projects may be undertaken individually or in a group. It is important if you are doing a group project that the contribution of the individual group members can be clearly identified for assessment purposes. The following are necessary for the smooth running of group projects:

- Each student should have a clear role and area of responsibility that leads to a definable contribution to the project outcome(s).
• Interim & Final Reports are to be written by individual students. An identical introductory chapter is acceptable, however, the remaining document needs to be an individual student’s work. You may need to refer regularly to work done by a group member, but this needs to be done in your own words.

• Mechanisms for the group to communicate and work together effectively are in place.

• Project planning must include a proper evaluation of the effect of each group member’s progress on the progress of the group as a whole.

• Record keeping by individual students in a Professional Notebook needs to be of a high standard

• Conflicting views between group members are quickly resolved by the project supervisor(s) in the first instance or if necessary by the course coordinator.

5 Supervision

You will be allocated 2 supervisors.

• Your Singapore (local) supervisor will provide the day to day management of your project and therefore will provide you with the technical support you need for your project. It is your right to ensure that you see your local supervisor on a regular basis.

• Your Newcastle academic supervisor is allocated to approve the academic content and scope of the project and then to support the local supervisors with management and technical issues.

• Your first contact point for your project is therefore your local supervisor. They also provide important input into your assessment and therefore should be clear on what you are doing throughout the project and how you have approached the problems that you faced within the project.

6 The Final Year Project Course

The Final Year Project Course is not structured in a “traditional” sense of lectures/tutorials and laboratories. The course is instead predominately based on individual or group work, which is performed and managed by the student themselves with support from project supervisors (managers). The course is constructed around a single engineering project in a similar way that you will soon be working on engineering projects as a graduate engineer in industry.

The course consisting of Part A & Part B together makes up 30 credit points of a student’s final year and the outcomes and assessment of this course will reflect this commitment.

6.1 Project Structure

6.1.1 Course Structure

(a) A formal lecture series will be offered on Blue Orange. Topics include:

• Planning and managing your Major Project
• Locating technical information
• Report writing
• Presentation and interview skills
• Professional ethics
• Occupational health and safety (OH&S) in the workplace
• Design Process
• Costing and Resourcing of Engineering Projects
• Case studies from the profession and industry

(b) Commencement of a major project that addresses a topic of significant industrial or academic interest within the student’s field of study (Electrical Engineering or Telecommunications Engineering).

(c) Occupational Health and Safety Requirements for Final Year Project Students
• Induction specified by PSB or workplace
• Project Risk Assessment Form

6.1.2 Mode of teaching

• The formal lectures will be held at PSB campus.
• Students may conduct the project either individually or in groups limited to \( \leq 3 \).
• Each project is to have one PSB or industry supervisor and one University of Newcastle academic supervisor.
• The PSB or industry supervisor is your engineering manager who will support you with the day-to-day issues that you may face in your project. Weekly meetings are recommended with your local supervisor.
• The University of Newcastle supervisor will liaise regularly with your local supervisor and provide project approval and academic assessment.
• University of Newcastle academic staff who are at PSB to present other courses will be available for consultation, problem solving, and mentoring of project students.

6.2 Project Assessment

There are two major assessment times during the course. The first period is at the end of Part A with your interim report and interview. The second and overall assessment is completed at the end of Part B with your Final Report and your formal interview and demonstration.

Each student will be marked separately. Thus in a group project each student is to hand in his or her own Interim and Final reports. Groups will have a final interview, which will include the group and then each group member separately. Individual members of a team will be assessed separately based on the identified contribution they made towards the project goal.

6.2.1 Assessment Part A

The major assessment in Part A includes the Interim Report and an interview the students will do in front of the local supervisor and recorded for assessment by the Newcastle supervisor or live with the Newcastle supervisor via video link if possible. A mark will then be given which will include the Interim Report and Interview.

6.2.2 Assessment Part B

The major assessment in Part B includes the Final Report and an interview, which will include a presentation and demonstration of the project. The interview panel will be made up of Newcastle academic staff member and the local supervisor. The journal may be requested during the interview. Please bring it along with your contributions page.

A mark will be given which will include the technical content for the Final Report and Interview/Demonstration and a Presentation mark for the Final Report and the Interview/Demonstration, refer to Section 6.2.3 for more details.

6.2.3 Assessment Structure
<table>
<thead>
<tr>
<th>Component</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A</td>
<td>Criterion Fail on Interim Report</td>
</tr>
<tr>
<td>• Interim Report</td>
<td></td>
</tr>
<tr>
<td>Part B</td>
<td>40%</td>
</tr>
<tr>
<td>• Final Report - Technical Content</td>
<td></td>
</tr>
<tr>
<td>• Final Report - Presentation</td>
<td>10%</td>
</tr>
<tr>
<td>• Demonstration / Interview - Technical Content</td>
<td>40%</td>
</tr>
<tr>
<td>• Demonstration / Interview - Presentation</td>
<td>10%</td>
</tr>
</tbody>
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Mandatory requirements:

PART A
- Satisfactory completion of OH&S requirements
- Satisfactory consultation with supervisor(s)
- Satisfactory completion of seminar
- Satisfactory progress of professional journal
- Criterion Fail will occur if the Interim Report mark is less than 50%

PART B
- Satisfactory consultation with supervisor(s)
- Satisfactory completion of professional journal
- Satisfactory completion of all assessment tasks

Interim grade awarded for Part A is:
- NA (formally “not assessed”)

Final grade awarded for Part B is either:
- a % mark according to above weightings if satisfactory; or
- FF if unsatisfactory and or fail for Part A interim report

6.2.4 Explanation of Assessment Components
<table>
<thead>
<tr>
<th>Component</th>
<th>Criteria used for evaluation</th>
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<tbody>
<tr>
<td>Technical content</td>
<td>• Awareness of and compliance with School, PSB Academy, University and legislative occupational health and safety standards and requirements.</td>
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<td></td>
<td>• Appreciation and understanding of context of project in relation to existing body of knowledge.</td>
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<td></td>
<td>• Independence of thought and discovery (that is, self-reliance in approaching the task at hand, but also the initiative to seek assistance when necessary).</td>
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<td></td>
<td>• Problem solving methodology (that is, the way in which inevitable obstacles are addressed and resolved).</td>
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<td></td>
<td>• Degree of difficulty of work completed (that is, not simply attempted).</td>
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<td></td>
<td>• Quantity of work completed (that is, on a credit point basis relative to other courses in the program).</td>
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<tr>
<td></td>
<td>• Elegance of solutions used in solving given problem.</td>
</tr>
<tr>
<td></td>
<td>• Innovation demonstrated in investigating or achieving solutions to given problem.</td>
</tr>
<tr>
<td>Presentation</td>
<td>• Ability to use graphical techniques to clearly and concisely represent technical or quantitative data (that is, not simply listing code, numerical data or circuit diagrams).</td>
</tr>
<tr>
<td></td>
<td>• Ability to use web-specific techniques to communicate technical work via the Internet (that is, not simply uploading material prepared for print media).</td>
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<td></td>
<td>• Ability to prepare and present formal technical reports.</td>
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<td></td>
<td>• Ability to convey technical information clearly and concisely to small-medium groups (that is, in a presentation environment).</td>
</tr>
<tr>
<td></td>
<td>• Ability to communicate technical information clearly and concisely with individuals (that is, on a one-to-one basis).</td>
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</tbody>
</table>

### 6.2.5 Outline of Assessment Instruments

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety requirements</td>
<td>The School, PSB Academy and the University have developed policies and procedures to comply with legislative requirements for occupational health and safety in laboratories. Students must demonstrate awareness of and compliance with all relevant aspects. A risk assessment must be done for each project.</td>
</tr>
<tr>
<td>Professional Journal</td>
<td>A Professional Journal is to be kept by every student. Professional hardbound notebook or diary in which is recorded all activities, sketches, rough workings, proofs and notes made during discussions with supervisors, colleagues and technical staff.</td>
</tr>
<tr>
<td>Instrument</td>
<td>Outline</td>
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<tr>
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</tr>
<tr>
<td>Interim report</td>
<td>A formal report describing the scope and direction of the project, relevant background material pertinent to the project, literature review, work completed to date and detailed plan of work to follow. This report is seen as a foundation to your final report. For group projects, individual students are required to write their own interim report. It may contain a similar introductory chapter and should refer to how the other group members work interconnects with their work.</td>
</tr>
<tr>
<td>Progress Reports</td>
<td>Regular email progress reports are required to be produced by the group (or individual) and sent to all supervisors. The progress reports should be based on a project management plan (Gantt chart) with explanation as to progress. These are not formally assessed but are part of the supervisor consultation process. Dates set out in the Key Dates are considered suggestions only and that arrangements that best suit your supervisor should be arranged early in the course.</td>
</tr>
<tr>
<td>Final report</td>
<td>A formal report detailing the scope and direction of the project, relevant background material pertinent to the project, and work completed to date. For group projects, individual students are required to write their own final report. It may contain a similar introductory chapter and should refer to how the other group members work interconnects with their work. It is mandatory that students include a ‘Student Declaration’ form as part of the report and a ‘Contributions’ page. A contributions page is a list of achievements and learning outcomes which you believe are a result of your work in the project.</td>
</tr>
<tr>
<td>Interview &amp; prezentation</td>
<td>A formal group (or individual) interview will be conducted by University Staff. Each student in the group will be required to do a presentation outlining their contribution to the project. Questions will be directed at but not limited to: establishing the scope and direction of the project, ensuring that the relevant background material pertinent to the project is understood, establishing what the work completed to date is, and information related to the difficulties faced in the project and management of the project.</td>
</tr>
</tbody>
</table>