

ENEL 300: Electrical and Computer Engineering Design 2 2020

Project 1: Product Development based on Departmental Research Technology

This is a group project. Each group **must contain three people**. Team up with two other people in the class. **EVERYONE** in the class must submit the names of their two group partners to the “Project 1 Group Submissions” activity in the “Project 1 Material” Section of the ENEL300 Learn resource. This must be done by **5 pm 18 July**. Groups of 2 people will **not** be accepted. If you cannot find two group partners, please let me and you will be allocated to a Group. **Note: If you do not submit your name, you will not be allocated to any group.**

This project involves designing a potentially commercial product and application based on your group’s choice of some research that is being carried out in the Department of Electrical & Computer Engineering (see www.elec.canterbury.ac.nz/research/ and academic staff webpages). Figuring out how to go from research to commercial product is a situation that exists for most engineering academics. There is a huge range of possible applications and products that could be based on Departmental research, so be creative! **Note:** Some of the Departmental research shown on the webpages is out of date. Make sure you pick some current research for your project (find out by contacting the relevant academic).

In order to check that your group isn’t heading down a potential dead-end with respect to product viability, your group should submit (by email to neville.watson@canterbury.ac.nz) a single paragraph identifying the research chosen, and basic product concept by midday **Friday 24 July**.

The objectives of this project are to learn about; (1) identifying relevant and appropriate applications for a technology, (2) product design/development, including thinking about marketing, costing, etc., (3) working in teams, and (4) communicating via a poster (which is a common form of presentation at technical meetings).

You will need to identify and define an application, with an analysis of why in that application your product will be better than competing technologies/products. Include as much technical detail as possible in your product design (especially expected specifications, and any formal design methodologies used). Remember, this is an engineering design course so a significant amount of actual technical detail is expected. It is strongly recommended that you make extensive use of References (including the recommended text for the course).

The project involves preparing a poster and a written report. **The report is worth 8%, and the poster is worth 7% of the total course mark. There is an expectation that people work equitably in project-based assessments.** As such, there is a **compulsory project requirement** to keep a timesheet record of time spent working on the project (the timesheet to be used is provided in the ENEL300 Project 1 material section on Learn). **Importantly, all group members** must sign-off on the weekly timesheet to confirm that each member agrees that the hours being claimed by each member have been done. At the conclusion of the project, you will submit the original timesheets (there should be 4 at least for the 4 weeks) along with the report and the signed-off hours will be added up for each group member. These signed-off hours will be used to calculate the relative mark each student will receive for the project. Since equitable work is expected, the relative mark calculation will be as follows:

The project is marked as per the marking schedule (Poster and Report) to give an overall Project Mark – **PM**.

HS is assigned to by 25 hours, the time expected to be spent on this assignment.

The other group members (with lower numbers of signed-off hours – **LS**) will be defined as contributing **$CL = (LS/HS) \times 100 \%$** .

The final mark for each student will be **$PM \times CL$**

Contribution notes:

- 1) If you do not return any signed timesheets, then you get zero marks for the project.
- 2) You can of course contribute more than 25 hours to the project yourself, but it is not reasonable to *expect* your group partners to put in more time than the course workload suggests (although you could

potentially suggest through persuasive argument that they should for various reasons). That is why the contribution *calculation* is capped at 25 hours.

3) An honest recording of actual hours is required (not a fictitious entry to make the 25 hours).

In **both** your report **and** poster you should try to address the following topics (devote most of your effort to topic 2).

1. A brief outline of the technology theory.
2. A detailed application and product description (including system-level schematic diagrams and specifications).
3. Include brief discussions of the following:
 - a. Comparative features analysis with competing technologies/products.
 - b. Manufacturing issues (component and material sources, site, labour, shipping, etc.).
 - c. Cost estimates (development, production, distribution, marketing, product price, competition, profit margin, etc.).
 - d. Marketing strategy (including any market surveys).
 - e. Potential distribution and sales outlets.

Reports:

Reports must be typed (11 point, Times Roman, single-spaced) and must not exceed 15 pages total (excluding Appendices). This is a group report (only one report per group). A Report marking sheet will be made available on Learn for your information.

Reports are to be printed out in hardcopy, and submitted (along with your signed timesheets) to the ENEL300 drop-box on level 5 in the Link building **before 5 pm Friday 7 August. Late reports and timesheets will not be accepted.**

Posters:

Posters should not be created to act like a product advertisement to the general public. Your poster should aim to convey highly summarised engineering information to a specialised audience (e.g. venture capitalists, engineers, product developers, etc.). For ideas on poster presentation, look at the posters around the ECE wing, and find some reference material that helps define what constitutes a good technical poster. Also some previous year's posters are available for viewing. **Put your group number and the names of your group members on your poster!** Note: If you include a University of Canterbury logo/emblem on your poster, it must only be in black and white (use of the colour emblem requires special permission).

Prepare your poster as size A0 in "**Landscape**" orientation. We will get your poster printed at the UC Copy Centre.

You must submit your poster file **in pdf format** to the ENEL300 Learn assignment activity in the "Project 1 material" section **10:00 am Friday 7 August**. No late posters will be accepted. This will give sufficient time to get your posters printed before the Poster session on **10 August**.

Posters will be displayed on Monday **10 August in the Machines Lab**. Collect your posters from the Machines Lab. and place them on the *Display boards* provided. An email message will be sent when the posters have been printed and ready for displaying. Both sides of the *Display boards* are to be used. Put your poster in the right place so that the posters are in **numerical order based on group number** (aids the markers). Posters will be marked between 9 am-5 pm (10 August) and will be available for viewing by the Class, ECE staff and visitors.

Some general suggestions regarding preparation of your poster:

- Keep the presentation tidy and clear and identify section order (heading numbering is best – just like you do in a report).
- Avoid using light-tone fonts on dark backgrounds – this will cause the reader to develop "lines" in their vision, which is very distracting.
- Use colour to enhance visual impact, but use in a clear and structured way, as too much colour in random places can also be very distracting.
- Avoid creating and/or using images that are far from being technically accurate to illustrate your product. This ends up making the poster look immature.
- Font size is important. You should use fonts that can be easily read at a distance of about 1.5m from the

- poster (no less than 36 point is recommended – including information that may be included in figures).
- Including some important references on your poster is a good idea. However, these references do not need to be readable from a distance of around 1.5m, and can be provided in a smaller font.
 - There is no need for super high resolution images. It is also important that images do not contain detail that is too fine to easily resolve by the reader at a distance of about 1.5m.
 - As well as Word and Powerpoint, you also have access to Visio and Coreldraw on the computers in CAE2. Visio & Coreldraw are powerful programs for this kind of work, however there is a learning curve.
 - Keep the file size as small as you can. This can be done by using jpeg images.
 - Don't use bitmap images.
 - Coreldraw has options for reducing the file size.
 - You can also produce a pdf from Coreldraw (which will further reduce the file size).
 - You can produce a pdf from a Word, Visio or Powerpoint file.
 - You should be able to get a final pdf file with a size of 1-5 MB (**poster files exceeding 6MB will NOT be accepted**).
 - If you produce a huge file it will take forever to print.