ECE4440/4991 – Capstone

Capstone Project Proposal

Learning Objective

To set up a comprehensive plan for a long-term, open-ended project for a specific customer. This is representative of any number of proposals done for government or industry to communicate between the engineering team and the end-users, investors, and/or funding managers.

Description

This will outline what your project is, described for the benefit of your customer. The more structure and detail you put into your Project Proposal to establish goals and plan tasks, the better you will be able to meet your objectives. The proposal should include the following sections:

Abstract

A one paragraph overview that gives the reader a clear sense of what your project is about.

Background

Here you should lay the groundwork for your project. Why you chose it, what similar projects have been done in the past (include references as necessary), what differentiates your project from past work by others, and how your coursework background has prepared you to work on this project.

Project Description

This is a detailed description of the project. This will lay the foundation of your final report, although there will likely be some changes to the project as it develops. You should include the following, with each bullet point having its own subsection:

- Performance objectives and specifications. Include features geared specifically for the end-user
- How it works, including block diagrams
- Technical details that justify your design decisions, including mathematical analysis and references that show the project is viable. This should include 10 to 15 references to journal papers, parts specs, and technical documents (Wikipedia does not count).
- Identify the major challenges you will need to overcome to implement the project
- A test plan for verifying the project functionality

Physical Constraints

Matters that pertain to your project but are not part of the project itself. Consider how these constraints will impact the development of your project. This would include:
- Part availability

1

Last revised on Sunday, August 25, 24 at 4:40:32 PM.

- Manufacturability
- Cost constraints for the prototype
- Resources and equipment required, and where you expect to get them if they are outside of your budget
- Software tools you will use

Societal Impact

Considerations for all the stakeholders with relation to public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors as appropriate. You should be thorough in your analysis here; consider it an ethical, even moral, obligation. Or if you are short on morals, consider it a way to cover all your bases in case you get sued for negligence.

External Standards

Standards and regulations that need to be met. You do not need to go into the specifics of each standard, but you should identify which ones apply to your project and why. Any standard you mention should be included in your references. Some standards to consider:

- NEMA standards, NFPA 70 (NEC), ASTM standards, etc.
- Communications, IEEE802, Bluetooth, etc.
- Board manufacture, IPC, etc.

Deliverables

What you will have produced by the end of the semester. This is a detailed description of the prototype, including major components like the PCB, power supplies, user interfaces, etc. This section should also include a budget outline.

Timeline

Your Gantt chart and discussion of it. Specifically identify tasks that can be done in parallel, and those tasks that must be done sequentially. Discuss the division of team labor, primary and secondary responsibilities, which should include current expertise as well as skills/knowledge that the team will need to develop to finish the project. You can do your Gantt chart in a spreadsheet, or you can use a Gantt chart tool. Some options (but certainly not the only ones) are:
https://www.officetimeline.com/online/gantt-chart-maker

https://templatelab.com/gantt-chart-templates/

https://www.ganttproject.biz/

Make sure your Gantt chart is legible! You may need to alter the format or break the Gantt chart up into sections so that when it is presented in the report, the text will still be large enough to be read.

Last revised on Sunday, August 25, 24 at 4:40:32 PM.

ECE4440/4991 – Capstone

Expectations

How will you define success for your project? How much of the project has to work for you to claim a grade of A? How much has to work for a B? Create a rubric that indicates degrees of success for your project as you envision it.

References

These should be done in IEEE reference format [1]. An example is shown below. A great tool for doing this is found at Zotero.org [2]. You should have 10 to 15 references for a good proposal, none of which should be Wikipedia. One of your sources may be a 'popular science' reference; the rest should be professional sources. This can include manufacturers' websites and .edu sites. If you use hobby sites, you should reference them, but they do not count toward your reference total. At least 2 sources should come from IEEE or ACM databases.

References

[1] C. Freid, "Are required courses meeting industry demands?," *IEEE Potentials,* vol. 20, no. 3, pp. 39-40, 2001.
[2] "Zotero: Your personal research assistant," [Online]. Available: www.zotero.org. [Accessed 02 Sep 2020].

Grading

Your submission should be delivered as a pdf, and have a file name format: CapstoneProposal_*YourTeamName*.pdf

You will be graded on the following:

Professional document (20%): Your proposal should be clear, well-written, and properly formatted. This includes 10 to 15 IEEE formatted references.

Technical Analysis (30%): Thoroughness and validity of the technical aspects of the project. This must be supported with calculations and references.

External Considerations (30%): Thoroughness and validity of the external factors that impact the project, including constraints, social impact, and external standards.

Logistics (20%): How well you define your project timeline, budget, division of labor, and resource allocation.

You can view the full rubric on the Proposal Assignment on Canvas.

Last revised on Sunday, August 25, 24 at 4:40:32 PM.