CSE499 Capstone Report Format Guide: Term-I

The report must include the following components:

1.	**The project title.**
2.	**Brief abstract.** In approximately 100-150 words, summarize the rationale for your project, the methodology, anticipated results, and conclusions you will draw from your work.
3.	**Problem statement** (<150 words). State the problem to be solved as indicated by the need (Supervisor, industry sponsor, or self-proposed). Present the objectives and expectations of the need and constraints given to the problem.
4.	**Aim and objective** (Objectives must be identified and written in bullet points) **Motivation** (< 150 words)
5.	**Brief review of the literature** relevant to your chosen topic, including citations. Give a brief summary of the key literature that has been researched and used in the design effort. This can include textbooks, handbooks, technical papers, technical reports, web sources, codes and regulations. A summary of similar designs, processes, or techniques can also be discussed to show strength and weakness of your design compared to others. Indicate whenever the design process was supported by previous coursework. At minimum, you will cite five professional or scholarly sources in your literature review. *This work can be used for the final project submission.* **** note that any work you include in your proposal can be used for the final project.***
6.	**A detailed project specification.** • Give a clear set of design specifications for the project. The design specifications should be clear concise statements with a specific metric and an appropriate value. • The specifications should provide an unambiguous measure of the success of the final design in meeting the need and constraints associated with the design problem. • Problem Requirements Specifications is a dynamic process. Although it is desirable to freeze a set of requirements permanently, it is rarely possible. Requirements are likely to evolve through an iterative process that involves communication between customer specifying the need and the technical community. The impact of proposed requirements must be evaluated to ensure that the initial intent of the requirements baseline is maintained or that changes to the intent are understood and accepted by the customer.
7.	**Proposed methodology** (< 500 words, Must Include Block Diagrams) • Concept Generation: Show that design methods were used to generate several conceptual solutions to the design problem. Draw sketches or tree diagrams to describe the alternatives that were produced by this effort. • Concept Reduction: Show that a judicial decision making process was used to reduce the number of possible conceptual solutions to a single (optimal) solution that is to be implemented and verified and/or validated by the end of the project. Discuss why alternative solutions were rejected/chosen over other solutions. Describe the criteria used to evaluate potential solutions. Substantiate that the proposed final concept is the optimal choice in providing the functionality necessary while best meeting the specified constraints of the design problem. Document in detail the decision making process. • Present and discuss the proposed design concepts which have been used to solve the design problem. Although this section should be supported by a text discussion it should be strongly supported by a detailed solid model and engineering analysis and design methods. Be sure to discuss the major subsystems in the design and the purpose and features of each subsystem. • Thoroughly present and discuss all engineering analysis used in the design process. Present all formulations, assumptions and parameters used. Show results of the analysis. The discussion must be clear enough for reviewing process as well as repeating the design. You should be able to prove that the design will not fail and will perform as required solely through analysis. • Justification and novelty – 'what is new' (< 50 words)
8.	In chart form, **a detailed timeline** of each task and when it will be completed. Include the schedule to meet with your supervisor.
9.	A **description of the final product or products to be completed.** What is the format of the outcome of this work? What will be the beneficiary industry/sector? How do you expect to share the results of your project? An exhibition? An international conference? Journal submission?

10.	**Cost Analysis** Design should include some form of economic analysis. Although not required, realistic design must be concerned with cost. Where appropriate, include an analysis for: • Prototype cost (parts and implementation) • Lifetime operational cost **Bill of Materials** Include a full parts list for the entire design if applicable. All standard parts should be completely identified by their code of specification. Custom parts must also be specified.
11.	**Social, Legal, Ethical and Environmental Issues** It is the ethical responsibility of the engineer to ensure that the solution to the design problem is safe to the public and the environment. This is substantiated by showing that Design for Safety methods were employed in the design process and documented through a Hazards and Failure Analysis. Discuss the results of the analysis and how the safety was incorporated into the design. Also, whether the product addresses local/international legal requirements needs to be described.
12.	**Conclusions** Give a brief summary of the results of the project, what was accomplished etc.
13.	Include a **reference list** corresponding to the citations made throughout your proposal.
14.	**Appendices (Optional)** Include in the appendices information that could not be included in the formal body of the report because it would disrupt the continuity of the discussion. Background materials, product catalogs, experimental data tables, and extra documentation should be placed in the appendix.

Items 1-5, 8, 9, 13 must be submitted during the mid-term presentation as part of Proposal Submission

FORMATTING AND STYLISTIC CONSIDERATIONS

The following are included as suggestions.

- Number the pages (the letter and title page do not have page numbers. The "Introduction" is page 1.)
- Use a clear and logical heading style to identify the main and subsections of the report.
- Use an easy to read font (such as Times New Roman).
- Use 1.5 line spacing and use a consistent amount of white space between sections and subsections.
- Use a 1" (2.54cm) margin on all 4 sides of the page.
- Use figures or tables whenever information is easier to understand in graphical or tabular form.
- Table captions and numbers go above the table.
- Figure captions and numbers go below the figure.
- Introduce tables and figures before they appear.
- All pictures should be digital quality or so they can be laser printed with high clarity in the report. Figures or tables taken from other sources must be properly acknowledged.