

## **ECE-498 Project Final Report Format – Design Report**

This report is due as part of ECE498 and will form the core of your ECE499 Final Project Report. First there are some general report guidelines and then there is a detailed explanation of typical sections found in a technical report at this stage of project development. Most sections are appropriate for all capstone design reports, but you may discuss the addition, deletion or modification of these sections with your project supervisor.

### **General Guidelines**

Be sure to introduce and summarize each section

Always write general to specific in each section

Do not write chronologically (a technical report is not a story or novel)

Use section and subsection titles to organize the report

Make sure that subsections follow each other in a logical progression.

Number each page

Use bulleted or enumerated lists when appropriate (requirements, subsystems, etc.) but explanations should be in prose form.

### **Figures and Tables**

Technical reports only contain Figures and Tables (not “Drawings, Pictures, etc).

Refer to graphs as figures, photos as figures, small code segments as figures, etc.

Figures and tables should be prepared professionally with appropriate tools, and not hand sketched.

Figures and tables should be located in the body of the text, **AFTER** they are introduced in the text, to supplement the discussion

Discuss the meaning and significance of the table or figure.

It is often appropriate to pull out small segments of code from a main program or to write pseudocode to describe an algorithm or major point of the project. This is considered a figure and should be titled and numbered as such.

If a group of figures or a long table or code listing takes up too much space, locate them in an appendix.

#### Figure titles and numbering

Figures should be numbered consecutively in the report

Every figure must have a descriptive title located immediately below the figure

#### Table titles and numbers

Tables should be numbered consecutively in the report

Every table must have a descriptive title located above or below the table

## References

All references should include author, title, journal or magazine title (if a journal article), publisher, page number, date. Below are sample references from a conference proceeding paper[1], book[2], journal article[3], Ph.D. dissertation[4], technical specification[5], and web page.

- [1] P. J. Hurst and W. J. McIntyre, "Double sampling in switched-capacitor delta-sigma A/D converters," in *Proc. IEEE Int. Symposium on. Circuits and Systems.*, 1990, pp. 902.-905.
- [2] J. C. Candy and G. C. Temes, *Oversampling Delta-Sigma Data Converters: Theory, Design and Simulation*. New York: IEEE Press, 1992.
- [3] L. R. Rabiner, R. W. Schafer, and C. M. Rader, "The chirp z-transform algorithm," *IEEE Trans. on Audio Electroacoustics.*, **AU-17**:6 (June, 1969), pp. 86-92.
- [4] S. Bagchi, "The nonuniform discrete Fourier transform and its applications in signal processing," Ph.D. dissertation, Electrical Engineering Department, Univ. California, Santa Barbara, 1994.
- [5] *Motorola CMOS Logic Data*, Series C, Motorola, INC, 1990, pp. 6-97 - 6-107.
- [6] EE Design Center - Questlink Technology, [www.questlink.com](http://www.questlink.com), 1999.

## **Project Report**

### **Cover Sheet**

Title of Project  
Author(s) of Project  
Course Number, Course Title  
Project Supervisor  
Date

**Table of contents (with page numbers) – note that most word processors will generate this automatically if you use section headings.**

**Table of figures and tables (with page numbers)**

### **Introduction (about 1 or 2 pages)**

The introduction should orient the reader to the report topic by identifying the need or opportunity that motivates the project. It should clearly state the goal of the project toward addressing this need or opportunity. It should end by giving a brief overview of the remainder of the report.

### **Background (3 to 6 pages)**

Discuss the broad societal and historical context of this general topic and describe what has been done by others, citing references as appropriate. After addressing the broader context, focus on aspects that could impact the development of your design requirements that are discussed in the design requirements section. Example topics to include would be: usability, accessibility and ergonomics, ethical and legal considerations, marketability, manufacturability, maintainability, codes and standards, policies and regulations.

### **Design Requirements (3 to 6 pages)**

Develop the detailed set of design requirements that served as the basis for the project. These should be based on the topics from the background section and any additional goals and constraints such as specific potential users, interpretation of rules of a contest, performance goals, or constraints of the working environment. The final list of requirements should be **quantified** and include calculations and justifications.

### **Design Alternatives (2-5 pages)**

Building on your project requirements, decompose the problem into the major functions or aspects that are required to solve the problem. These should be described in words, and visuals such as block diagrams or other figures can be used if they are helpful. Present alternative

solutions that you considered for each function in the design. This discussion should include the advantages and disadvantages of each solution approach. The section should conclude with a concise description as well as a justification for the design approach that you settled on.

### **Design (3-8 pages)**

This is the most important and the longest section of the report. Describe your design starting with the top level and ending with the details, including hardware and software as appropriate. It should have a block diagram at the top level, and be decomposed into as many levels as necessary. Include all details such as schematics, pin lists, parts lists and pseudocode at the bottom level. Explain the design choices made at each level using as much quantitative information as possible. The final result should be a clear design proposal which you will use in the Winter Term to complete your design project. In other words, it should be as clear and specific as possible. Be sure to cite any outside work that you used.

### **Preliminary Testing Results**

If you have done any testing of subfunctions, describe your tests and results in this section.

### **Implementation Schedule**

Include a schedule for the completion and testing of your project.

### **References**

Give a bibliography listing all references used for background work, the specification of parts, cost comparisons, etc.

### **Appendices**

Include code listings developed for testing or any other details that complete the design at this stage and that are too long to include in the main part of the report.