

Remark: This lecture covers an essential template to prepare the final report of the course. It is presented here, because we are almost three quarters into the course and students must begin putting their thoughts together and organize their exit. The following order is important and must be maintained, but there are flexibilities in various subsections, which can be used as one wishes.

Introduction

The final written report is the crown jewel of this course. This report must cover all the materials presented in the final oral presentation, plus any additional supporting information, which pertain to each project. In other words, everything that is claimed in the final oral presentation must be supported in this document by **technical reasoning**. At this stage, there are two major issues confronting us:

- (1) Who does write the final report?
- (2) How this report is to be written?

The answer to the first question is obvious. ***Everyone must contribute to this writing.*** All of you must show that you have learned how to write at least a short technical document, per last lecture note. Here is the place to put that training into the use. We suggest that each member writes, say a chapter or two according to the instructions of the preceding lecture note, then try to integrate these pieces by proof reading each other's writing into one final coherent report. You may divide this writing by actually assigning each section to the person whom has actually done the work or has contributed more to that section than others. Each chapter must look like a technical document in the style of the preceding lecture note. The second best thing to do is to let one person write the first draft, then the next person edits and adds to that. Clearly, you cannot write together, in the sense that every line is written simultaneously by every team member. Thus, try to break the work by the sub-area of the final report and let everyone writes a piece, then integrate all pieces. ***Please be specific in identifying the name of the person who has written the specific part of the report.*** Similarly, the person who has led the integration of all parts into the final report should be identified. Finally, you must write this report first, and before preparing from it your slides for final oral presentation, and not the other way around.

No matter who does what, the final written report must be perfected to cover all aspects of the design as described in this course completely.

On the second question of how to prepare this final report, we make the following assumptions first.

- (1) We assume that everyone is capable of writing, albeit a short, technical document according to the structure that is described and perfected in Lecture Note Fourteen.
- (2) We also assume that everyone is fully cognizant of what we have called repeatedly as the ***Elements of Design*** in this course, which really culminates all our efforts.

Now, the question is how do we put these pieces together? To that end, we offer the following structure, which is an expanded version of a short technical report that is described in the preceding lecture note.

The Structure of Final Report

In addition to each team member's and the technical advisor's copies, **four** copies of the final report must be submitted, each in a clear cover with a plastic slide that holds papers, unless you choose to bind in a manner that takes **less space**. These copies are for the department, library, and the course instructor.

1. **The Cover or Title page** (This is your page "i," when counting, but we do not put this number herein.)

A ("A" means, we have room to modify portions of below as necessary) style for this page is shown below:

Final Report of Senior Design Project

Winter / Spring 2001

Professor Mansour Eslami

(*Comment:* The name of the course instructor)

The University of California at Riverside

Department of Electrical Engineering

(letter size 14)

(Space between any two segments should be chosen accordingly.)

Title of the Project – All Words Begin With an Upper Case

(letter size 12, similarly the rest as well)

(*Comment:* This title can be different from the one you started, if your technical faculty advisor agrees.)

Prepared by: Karl Curtis Doering (The *first author* edits the final report, and perhaps has done more.)

Michael Wilson (If the *second author* has worked equally, put this name on the same line as above.)

(*Comment:* Only here you give names according to their contributions to the final report.)

Technical Faculty Advisor(s): Mr. Bob Kelly, Senior Engineer at Maxim Corporation

(*Comment:* If this person is from outside the department give his/her affiliation.)

(Also, when there are several advisors, list them in the order of their contributions.)

This project is supported in part by a contract (grant) from Maxim Corporation.

(*Comment:* Here, indicate the funding agency that supports the project, if any.)

Submitted on June 7, 2001 at 5:00 PM

2. **The Executive Summary** (This is your page "ii," but we do not put that number herein neither.)

The (note that here, you must be exact) style for this page is shown below:

Executive Summary – In just **one** page, present the summary of your work by outlining the problem statement, the chosen method, key features, method of solution, evaluation method, and your important results. You may use several paragraphs, each for one thought, but no more sub-sections. This is just an expanded version of the abstract of your intermediate reports. The last line (or two lines) of this page should look as follows. (Pay special attention to the style, each keyword is separated by a comma or a semicolon; and some begin with upper cases and some do not – here you need to consult your technical faculty advisor).

Keywords – *Wireless communications, transmitter design, Wide-band, Code-Division, Multiple Access transceiver design.*

3. Table of Contents (This is page “iii,” which you type at the bottom of this page, and if your table exceeds one page, then the next page is “iv,” and so on.) This page is followed by the body of the report as shown subsequently in Appendix A.

A (“A” means, we have room to modify sub-sections below as necessary) style for this page is shown below:

Table of Contents

Page

Chapter One – Introduction (This chapter is prepared primarily by the first author, or give the name.)

(In reality, this chapter is written at the end, when the project is completed and the following is written.)

1.1. Introduction1

(**Comment:** Before going to the next section, i.e., in the last paragraph of this section, put a local table of contents, describing the rest of this chapter. Similarly, you need to do this for each chapter below as well.)

1.2. Whatever Else You Wish To Add3

(**Comment:** For instance, you may give a summary of your problem statement with a historical perspective; motivations and goals of the project; what the general solution(s) may entail; and what the reader should expect to read in this report.)

1.3. A Glossary of Acronyms and Abbreviations.....9

(**Comment:** Put all such items here in the introduction chapter and refer to this section for future reference.)

Chapter Two – Design and Technical Results (This chapter is prepared, for instance, jointly.)

2.1. Introduction (follow our earlier instructions for these sub-sections).....12

2.2. Problem Statement14

2.3. Design Specifications15

2.4. Whatever Else You Wish To Add (For instance, Lessons Learned).....16

(**Comment:** In each of the above sub-sections, you may use block diagrams to break the problem and its various tasks into a few smaller and perhaps more manageable segments, which are delivered by different team members.)

Chapter Three – Method of Solution (This chapter is prepared primarily by Michael Wilson.)

3.1. Introduction.....17

(**Comment:** Here, you provide an overview of the design solution – the “Big Picture.” You may give another sub-section between here and below to review possible solutions, which you did not select. Also, do not forget the Comment below § 1.1. in above.)

Table of Contents Continued

	Page
3.2. Our Design.....	18
<i>(Comment: Here, you must emphasize the key features of your special contributions to this design problem. You may use block diagrams to describe each component and its special function. Present whatever you deem necessary in order to give an excellent description of your work. Put your hearts into this section.)</i>	
3.3. Alternative Approach / Design Trade Off	19
<i>(Comment: Presents concept generated and your selection method(s). Those of you who claim are working on an original design and concept should give some explanation here. If details are distracting, you may use portions of those in an appendix.)</i>	
3.4. Lessons Learned	20
 Chapter Four –Evaluation (This chapter is prepared primarily by Karl Doering.)	
4.1. Introduction.....	21
4.2. Discussion of Results / Test Plan.....	22
<i>(Comment: This title is just too generic purposely at the moment, however, you need to have a description of your prototype relative to the production model. You need to explain your test plan here, or if you wish so immediately under a new sub-section followed.)</i>	
4.3. Design Comparison / Design Trade Off.....	24
<i>(Comment: In this chapter you need to give a comparison between what you have designed versus your original design specifications. You must state all characteristics of your design, which include its strengths and weaknesses. You may also state your design trade off had you chosen another method of solution.)</i>	
 <i>The above evaluations are relative to your work, in other words, these are local and technical evaluations. The global evaluations, that compare your entire work with others, are discussed in Chapters Six & Seven.</i>	
 Chapter Five – Administrative (This chapter is prepared jointly.)	
5.1. Introduction.....	25
5.2. Budget and/or Cost Analysis.....	26
<i>(Comment: Have you met your design specifications as far as the cost is concerned? This evaluation is different from the previous one. There, you can promote your technical contributions by saying our test plan shows that we have met all our technical design specifications. Here, you give a cost analysis, before we go to the next chapter and evaluate the overall project from a number of issues – cost included - globally. This sub-section should include whatever issues are discussed under funding in various sections of this course, more specifically Lecture Notes Eight, Nine, Seventeen to Nineteen, as pertain to your project.)</i>	
5.3. Whatever Else You Wish To Add.....	27
<i>(Comment: For instance, you may write about your experience in working together, some of your ways of breaking various tasks among yourselves and complying, or otherwise, with all scheduled assignments. Whatever experience you think is relevant and worthy of discussing or sharing with others.)</i>	
 Chapter Six – Meeting Expectations (This chapter is prepared jointly.)	
6.1. Introduction.....	28
6.2. Design Constraints.....	29
<i>(Comment: Have you met all your design specifications, this is different from Chapter Four. There, you can promote your technical contributions by saying that our test plan shows that we have met our design specifications. Here, you must be explicit in discussing your deviation, if any, and its corresponding effect on the final outcome. Some sort of a sensitivity analysis.)</i>	

Table of Contents Continued

	<i>Page</i>
6.3. Elements of Design.....	30
<i>(Comment: All those issues, which are discussed in this course, including, but not limited to, economics factors, safety, reliability, aesthetics, ethics, and social impacts, must be addressed explicitly herein. You may use a table to respond briefly about some of these matters that are tangentially related to your project. However, to neglect addressing these issues specifically will affect your final grades extremely.)</i>	
<i>In the above chapter and in some instances in the next chapter you give a global evaluation of all issues pertaining to your project.</i>	
 Chapter Seven – Conclusions (This chapter is also prepared jointly.)	
7.1. Introduction.....	31
<i>(Comment: In this chapter you explain positively that you have accomplished your goals to the best of your ability, nothing more, and nothing less. Failure to state in this manner means something is wrong. You are not allowed to complain and give reasons why you have failed. However, if you have not met your goals you must state so, without any request, i.e., do not ask for mercy!)</i>	
7.2. Expansion and Improvement.....	32
<i>(Comment: Discuss the impact of this work and its possible expansion into perhaps a more promising design than what you had started. This is particularly important in order to address the marketability of your design. Or why this project merits another look by perhaps next year's students.)</i>	
7.3. User's Manual.....	33
<i>(Comment: If your design requires instructions for future use, here is the place to put that information.)</i>	
 Appendix A: Parts List.....	 34
Appendix B: Equipment List	35
<i>(Comment: Some of the special hardware components and/or equipment, which are used in your design must be described in more detail than what is presented in your intermediate reports. Choose this place to explain those issues.)</i>	
Appendix C: Software List	36
Appendix D: Special Resources.....	37
Appendix E to Z: Whatever Else You Wish To Add.....	38
<i>(Comment: For instance, here, you may include detailed solution methods or derivations, which you need for your future review of this report, or whoever else is interested to pursue this study. Some side drawings and printouts that are of value to people who may continue this work, should be given herein. Some information about the vendors and how to locate parts for similar projects must be included herein. In other words, information that is important about the overall construction of the project should be given herein.)</i>	
 References.....	 39
<i>(Comment: Use our citation procedures and list in alphabetic order all your references based on their first, second, etc., authors, in a chronological order. You may include these references depending on each chapter or as a whole. A report without references is considered very weak and unacceptable. A report without references from a refereed media is considered weak.)</i>	
 Acknowledgement.....	 40
<i>(Comment: Be considerate and credit all those who have helped you in this project, especially, if your advisor have paid for the expenses from his/her grants.)</i>	

Final Thought

Although we have several more weeks of school, we put these instructions before you, in order that you start working on your final report. We hope that you use the above template together with your own unique style to come up with a very successful report. We also hope that you enjoy using the above for all your future technical writings.

Closure

The class ends with the following comment that each person in any given team should look into one piece or mosaic of the above “Big Picture,” and get every thing ready before the deadline.

Essential thoughts in this lecture

Issues.	Applicability to your project, if any.
Compartmentalization of thoughts finally pays off!	Obvious!
Do you want to add anything else?	Please elaborate.

Appendix A: The Checklist for Final Report

