Mechanical & Aerospace Engineering Department

Guidelines for Graduate Project/Thesis
Oral Presentation and Report

Following your preparation of the Graduate Project/Thesis Proposal and receiving approval by your Study Committee Chair, you are expected to work closely with your Committee Chair and your Committee Members to prepare for a successful completion of the study. Attached are guidelines for your semester written reports and oral presentations.

I, _____ acknowledge receiving a copy of these Guidelines and will inform my Study Committee Chair and Members of the specific time of presentation of my project.

Signature: _____ Date: _____

Project Presentation Guideline

? You need to schedule your presentation through the course instructor for the presentation day and inform your committee members.
? Each **presentation** to be 30 minutes long including 10 minutes for questions and answers.
? Each presenter to have 10 to 15 overhead foils / Powerpoint slides to include, as the minimum:

1) Project Title
   Committee Members' Names
   Student Name
   Course Name and Number
   Date of Presentation

2) Personal Background of the presenter, including:
   BS Degree Field of Study,
   BS Degree School Attended,
   Date of BS Degree Awarded,
   Employer Name,
   Job Title and Activity (if employed),
   Motivation to do this Study

3) Presentation Outline to include:
   Introduction and Background of the Study
   Objectives
   Methodology
   Analysis
   Experiment (if applicable)
   Results
   Discussion
   Conclusion(s)

- Each student is expected to submit a written draft report to the study Committee Chair two weeks prior to the presentation day, and a final report to the Committee Chair and Members no later than the presentation day.

- Each student is expected to submit a final copy including the signature sheet to the course instructor within a week after the presentation in any form such as stapled or spiral bound for grades to be assigned.

- Each student is expected to submit one hardbound cover of the project report including an original signature sheet to the Committee Chair and the Course Instructor each. Each student is expected to ask the members of the study committee if they would like to have a hardbound copy.

Written Report Guidelines

The quality of a written report carries a message farther than the spoken word and have greater permanence.

Steps in Writing a Report

The five operations involved in the writing of a report are best remembered with the acronym POWER.

- P Plan the writing
- O Outline the report
- W Write
- E Edit
- R Rewrite

The planning stage of a report is concerned with assembling the data, analyzing the data, drawing conclusions from the data analysis, and organizing the report into various logical sections. The planning of a report is usually carried out by considering the various facets of the work and providing a logical blend of the material. The initial planning of a report should begin before the work is carried out. In that way the planning of the work and planning of the report are woven together, which facilitates the actual writing operation.

Outlining the report consists of actually formulating a series of headings, subheadings, sub-subheadings, etc., which encompass the various sections of the report. The outline can then be used as a guide to the writing. A complete outline can be detailed to the point at which each line consists of a single thought or point to be made and will then represent one paragraph in the report. The main headings and subheadings of the outline are usually placed in the report to guide the reader.

The writing operation should be carried out in the form of a rough draft using the maximum technical and compositional skill at the command of the writer. However, do not worry about perfection at this stage. Once you get going, don't break stride to check out fine details of punctuation or sentence structure.

Editing is the process of reading the rough draft and employing self-criticism. It consists of strengthening the rough draft by analyzing paragraph and sentence structure, economizing on words, checking spelling and punctuation, checking the line of logical thought, and, in general, asking oneself the question "Why?" Editing can be the secret of good writing. It is better for the writer to ask himself embarrassing questions than to hear them from his technical readers, his supervisor, or his instructor. In connection with editing, it has often been said that the superior writer makes good use of both ends of the pencil.

It is generally good practice to allow at least a day to elapse after writing the rough draft before editing it. That allows the writer to forget the logical pattern used in writing the report and appear more in the role of an unbiased reader when editing.

Many mistakes or weak lines of thought that would normally escape unnoticed are thereby uncovered. The rewriting operation consists of retyping or rewriting the edited rough draft to put it in a form suitable for the reader. An important tip for preparing a handwritten report draft is to use every other line on the paper. In that way you will be able to make correction in the empty lines and use part of your rough draft without doing a complete rewrite.

Suggested Outline to use in Organizing a Report for your MS Project

- Title Page
- Copyright Page
- Signature Page
- Abstract
- Acknowledgement
- Table of Contents
- Nomenclature (if applicable)
- List of Tables (if applicable)
- List of Figures (if applicable)
- Introduction
- Methodology
  - Analysis/Modeling
  - Experimentation
- Results and Discussion
- Conclusions/Recommended Future Work
- References
- Appendices

For general format of the report, in particular, the Title page, signature page, and abstract page, refer to SJSU General Catalog section "Master's Degree Thesis" under "Manuscript Preparation." Note that a Graduate Project, unlike the thesis, would not require "Approved for the University" on the signature page.

Following may be helpful in providing the writer with additional information and tips in preparing a report.

The Abstract-A Summary of the Entire Report

An Abstract is a complete, concise distillation of the full report. Although first in the report, it is always written last. It provides a brief (one sentence) introduction to the subject, a statement of the problem, highlights of the results (quantitative, if possible), and the major conclusion. It must stand alone without citing figures or tables. A concise, clear approach is essential. Most abstracts are short and rarely exceed 200 words.

The Introduction-Why Did You Do What You Did?

An Introduction generally identifies the subject of the report, provides the necessary background information, including appropriate literature review, and provides the reader with a clear rationale for the work described. It states the hypothesis or concept tested. The introduction does

not contain results and generally does not contain equations. The use of figures and tables should be limited in the Introduction.

Analysis Modeling-What Does Theory Have to Say?

An Analysis section describes a proposed theory or a descriptive model, if available. It does not contain results, nor should extreme mathematical details be provided. Sufficient detail (mathematical or otherwise) should be provided for the reader to clearly understand the physical assumptions associated with a theory or model.

Experimental Program-What Did You Measure and How?

The Experimental Program section is intended to describe how experimental results were obtained. Provide an overview of the approach, test facilities, validations, and range of measurements. As a rule of thumb, provide just sufficient detail to allow the experiment to be conducted by someone else. Do not give instructions or commands to the reader; rather report what was done. If a list of equipment is included in the report. it should be a table in the body of the report, or it should be placed in an appendix. Uncertainty analysis information can be described either here or in the Results section. or both. In cases in which both an analysis and experiment are described. these two sections of the report should complement and support each other. The relationship of the analysis to the experiment should be clearly stated. If a numerical simulation was performed, it might be described under a separate heading, such as Numerical Model, using guidelines similar to those under the Experimental Program.

Results and Discussion-So What Did You Find?

Here you present and discuss your test results and tie them back to your original objectives or hypothesis. Data must be interpreted to be useful. This transforms raw data into useful results. When presenting your results, remember that even though you are usually writing to an experienced technical audience. what may be clear to you may not be obvious to the reader. Assuming too much knowledge can be a big mistake, so explain your results even if it seems unnecessary. If you can't figure them out, say so: "The mechanism is unclear and we are continuing to examine this phenomenon:' Often the most important vehicles for the clear presentation of results are figures and tables. All of the figures and tables should be numbered and have descriptive titles. Column heads in tables should accurately describe the data that appear in those columns. Each table and figure must be explicitly and individually cited and described in the text of the Results section. Since you have spent significant time in preparing the plots and tables, you are intimately familiar with their trends and implications: the reader needs your insight to understand the results as well as
you.

Conclusions-What Do I Now Know?

The Conclusions section is where you should concisely restate your answer to the question, “What do I know now?” It must support or refute your hypothesis. It is not a place to offer new facts, nor should it contain another rendition of experimental results or rationale. In a short summary, restate why the work was done and how it was done, and provide a conclusion to the work. An appropriate conclusion might be "The temperature measuring system calibrated in this study was found to indicate the correct temperature over the range 30-250 ^{o} F with no more than a $\pm$ 1^{o}F uncertainty at 95% confidence:" It would not normally be useful or appropriate to

conclude. “The temperature measuring system was tested and worked well.” Conclusions should be clear and concise statements of the important findings of a particular study; most conclusions require some quantitative aspect to be useful.

References

The references cited in a formal list should be available to the reader and described in sufficient detail for the reader to obtain the source with a reasonable effort. References for this document provide a format guide.

Appendices

Appendices are places to place superfluous but possibly useful information. They should stand on their own and should not provide information critical to the report that information should be in the main body of the report. Uncertain whether information should be in an Appendix? Ask yourself: If the reader did not read the Appendix, would the report be sufficient? It should be!

Writing Tips

1. Accuracy is important, but so is consistency. Define all nonstandard terms the first time they are used and stick to those terms and definitions throughout all writing on that subject. Err on the side of clarity if you must err, so that if a particular construction is questionable, add the extra words that make it longer but guarantee its clarity.
2. Don't overdo significant figures. This is one of the surest ways of convincing the astute reader that you are an amateur. How many figures can you reproduce for a given measurement? Use that number.
3. Avoid the use of contractions and possessives and jargon. On occasion, jargon serves a useful function-one of neatly describing or labeling an otherwise troublesome concept or process. Still, use jargon only when your audience will understand it and a simple substitution doesn't exist.
4. Technical writing is often in the third person to focus attention on the subject matter at hand. The active voice is preferred where possible, but choose the style that suits your writing best. The important thing is to communicate effectively.

Text and Figure Format

Be sure to allow one inch margins from the top and bottom and ¾ inch from each sides. For pages with “landscape” format of a figure or diagram, it is customary to turn the page clockwise to view the content.

APPLICATION OF TRIVALENT CHROMIUM IN COMPLIANCE WITH RoHS

Sample

A Project

Presented to

The Faculty of the Department of

Mechanical and Aerospace Engineering

San Jose State University

In Partial Fulfillment

of the Requirements for Degree

Master of Science

In

Mechanical Engineering

By

Anusha Selvakumar

December 2006

San Jose State University

The undersigned Faculty Committee Approves

The Application of Trivalent Chromium in complain with RoHS

of

Anusha Selvakumar

APPROVED FOR THE DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

Dr. Fred Barez, Committee Chair — Date 12/14/06

Dr. Nicole Okamoto, Committee Member — Date 12/14/06

Mr. Daniel Bishop, Committee Member — Date 12/14/06
Cisco Systems, Inc.

ABSTRACT

Application of Trivalent Chromium in compliance to RoHS

By Anusha Selvakumar

The European Union established directives related to the use of various hazardous substances that are to be banned in all the electronic components to be shipped to the European Union, effective July 1st 2006. These new directives resulted in several controversies in electronics industries throughout the world. This project focuses on the qualification criteria for enclosures coated with trivalent chromium as a replacement for hexavalent chromium material previously used. Four main tests were to be performed to qualify this material. The qualification studies were based on experimental, analytical and simulated results. The analytical and experimental works were carried out to address heat degradation, electromagnetic compatibility, corrosion resistance of the coating material, trivalent chromium. These tests proved that trivalent chromium is an acceptable material to use on enclosures meeting RoHS compliance. Telecoms industries are the most affected by the RoHS compliant directive, and are working on improving the shielding effectiveness of the enclosure material.

ACKNOWLEDGEMENTS

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1.0 INTRODUCTION

Restriction of Hazardous Substances (RoHS) is one of the main concerns of the electronic packaging industry. With the constant development in technology and the sophistication of electronic devices, the requirement to restrict the hazardous substance becomes important. The restrictions of these substances are done taking into consideration the environmental and social hazards possible due to prolonged use of these materials.

The European Union has banned the usage of six substances that are explained below. RoHS was initiated with the European Union (EU) directive banning the use of six hazardous substances, including:

- Lead (Pb)
- Cadmium (cd)
- Mercury (Hg)
- Hexavalent Chromium (cr 6+)
- Poly bromated biphenyl's (PBB's)
- Polybrominated diphenylyethers (PBDE's)

in all electronic equipment shipped to the EU effective July 1st 2006 [1].

However, these directives would allow 0.1% by weight maximum for Pb, Hg, Cr6+, PBB's, and PBDE's 0.01% by weight maximum for Cd. The RoHS Directive has granted an exemption for lead used in solder for network infrastructure equipment until the industry finds dependable lead free alternatives [1]. One such example is Swatch, a watch manufacturing company, using very high lead content and has been exempt.