

MASTERS THESIS FORMAT GUIDELINES

CHEMICAL AND MATERIALS ENGINEERING DEPARTMENT

SAN JOSE STATE UNIVERSITY

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## CHAPTER ONE

### HOW TO FORMAT A CME THESIS

#### 1.1 Organization of the Text

##### 1.1.1 Overall

This document provides visual instruction on the accepted way to format a thesis or project report for submittal to the CME department. Please use this style only. The University thesis guidelines available on the Grad Studies website has more details, and does not conflict with this document. Follow University guidelines for page margins, numbering, cover page, etc. Any formatting issue not covered in this document must be done according to University guidelines; you need both documents to properly finish a thesis. The main differences between University guidelines and department guidelines are in the reference formatting. *Read both documents thoroughly* before writing your thesis proposal. In all cases the Grad Studies Office has the final say on thesis formatting so if you discover a conflict bring it to the attention of your advisor. It is also required that you write your thesis or project *proposal* following these guidelines, because you will be in a better position to write your final thesis or project report.

Text should be left justified only. All new paragraphs should be indented 0.5 inches. NOTE: Five spaces is not the same as 0.5 inches.

Do not bold any headings anywhere in the thesis. Although the SJSU Thesis Guidelines suggest that bolding may be acceptable, in reality they seem to reject theses that have any bolding.

There are two spaces after every period, (and colon) no matter where that period occurs with the exceptions of decimal points or the like. For instance, at the end of a sentence, or at the end of a figure number such as Figure 1. In addition, Graduate Studies requires a comma between nouns for three or more in a sentence; e.g. There are an apple, a banana, and an orange on the table.

When referring to a Chapter, a Section, an Appendix, etc. in the text, these should always begin with a capital letter. For example: As mentioned in Chapter Three. As shown in Appendix A. This is the same for figures and tables. For example: As shown in Table 1 and Figure 2.

In the case of long headings (more than one line) for figures, tables, references, or Table of Contents sections, these should be single-spaced. Double-space between one heading and the next in your Table of Contents. Single space each reference but double-space between one reference and the next in your List of References.

It is up to the author (you) to proof read their thesis and correct all spelling, formatting and grammar errors. Your thesis will not be approved by Graduate Studies if you have more than 15 of these type errors. In fact, it will be returned and you will be requested to completely proof read it and correct all errors and if you resubmit it while it still contains errors it will not be accepted again until the next semester.

### 1.1.2 Chapters

Notice above that the Chapter Number and the Chapter Title use all Upper Case. Only chapter headings are formatted in all upper case. Chapters must always begin on a new page. Note: Your Objectives/Hypothesis Chapter must have a few paragraphs in

order to be considered a chapter. In addition, if you have a hypothesis, you must state it directly such as “ The hypothesis of this study is...”.

The basic chapters that should be in each project or thesis report are:

Introduction

Literature Review

Hypothesis/Objectives

Materials and Methods

Results

Discussion

Conclusions

References

You may also have a Background Chapter if your Introduction Chapter would otherwise be too long. You may want to include a separate Future Work Chapter if you don't include that in your Results and Discussion Chapter. Your Results Chapter and Discussion Chapter may be combined into one chapter.

### 1.1.3 Sections and Sub-sections

The section number follows the chapter number, all in Arabic numerals. The section heading is capitalized. Notice that small connecting words such as “and” and “or” are not capitalized. Use a “tab” after the number, before inserting the section heading. Use the same tab spacing for sections, sub-sections, and so on, so that all headings in the document are lined up.

You may have multiple sections in a chapter, but you can't have just one section. If you have one sub-section, then you must have multiple sub-sections, and so on. In addition, each section should be at least two paragraphs long. You do not need sub-sections if you only have one paragraph of information. If your chapter is only one page long, you don't need to divide it into sections.

It is generally better not to go below sub-sections because it gets very confusing after that. Just use paragraphs to separate ideas within the sub-section. There may be exceptions to this but use judgment in sub-dividing your work too much. Consult with your adviser if you are unsure about your sectioning.

## 1.2 Required Frontmatter

See the SJSU Thesis Guidelines for the required frontmatter, such as signature page, copyright page, etc. along with proper content and formatting of the frontmatter.

### 1.2.1 Table of Contents, List of Figures, List of Tables, Other Lists

A Table of Contents is required. This must start on a fresh page, with "Table of Contents" on the top, centered. All chapter, section and sub-section headings appearing in the text must appear in the Table of Contents, with appropriate page numbers on the far right hand side. The only thing to be left out of the Table of Contents is the "Title Page" and the "Table of Contents" itself.

A separate "List of Figures" and "List of Tables" is to follow the "Table of Contents". For theses that are either mathematical in nature, or that use a fair amount of mathematical formulations, it is recommended that a separate "List of Symbols Used" be included, following the "List of Tables". This "List of Symbols Used" should have a

listing of the symbols, an explanation of what each symbol stands for, and if appropriate, the applicable units.

Likewise, for theses that use a large number of acronyms and/or abbreviations, say greater than 15 or 20, a separate "List of Acronyms/Abbreviations" should be included.

### 1.3 Pagination

Page 1 (Arabic numeral) indicates the beginning of the text itself, in other words, page 1 of Chapter 1. Arabic numerals will continue to be used until the end of the thesis. Place the page number in the center of the footer. The page number on the first page of **text should be suppressed.**

All pages preceding page 1 of Chapter 1 should be numbered using lower case Roman numerals, beginning with page (i) for the title (cover) page. There is more discussion on this in the SJSU Thesis Guidelines document.

Do not allow “widows” (the last line of a paragraph which appears alone at the top of the following page) or “orphans” (the first line of a paragraph which appears alone at the bottom of the page) in your text. If they appear, insert page breaks where necessary to control the spacing of paragraphs, or alter your text.

### 1.4 Figures

Figures by themselves do not convey any information to the reader. Do not assume that the reader will automatically understand the figure. The author needs to discuss the importance of each figure in the text. All figures should be called out in the text using the Figure number, rather than the page on which they appear. The figure

called out should then appear at the first possible place after it has been called out. This would typically be in the same page or the following page. It is recommended that there be only one figure per page, unless two can fit neatly and not appear crowded.

All figures should be numbered sequentially, starting with Figure 1 for the first figure appearing in the text. Do not use chapter numbers as part of the figure number. Figures should be captioned at the bottom. Captions should be left justified, centered under the figure, and employ sentence case (i.e. only the first word capitalized and with a period at the end). There should be a period followed by two spaces after the figure number in the caption. See Figure 1 as an example. Allow enough spacing after the figure so the caption is distinctly clear from the subsequent text. If the caption is more than one line long it should be single-spaced. When referring to a figure, capitalize it; for example, Figure 1 is a really interesting drawing.

Figures which have been obtained from other sources must be cited in the caption using a bracketed citation [1]. For a thesis, permission to copy must be obtained from the publisher. Forms for this can be obtained from Graduate Studies; allow enough time to get the permissions. Permission requests are also available on-line for many journals. Obtaining permissions during the proposal preparation phase in MatE/ChE 281 is recommended.

For figures containing graphs, make sure each axis is fully labeled, with the property, symbol and units. The caption needs to be on the same page as the figure. In general, experimental data is best displayed using a scatter plot without connecting the points while theoretical lines are best displayed by solid lines. Fitted curves should be clearly labeled including equation and correlation coefficient. If more than one curve is

included in a figure, each curve should be appropriately labeled. See Figure 1 for an example.

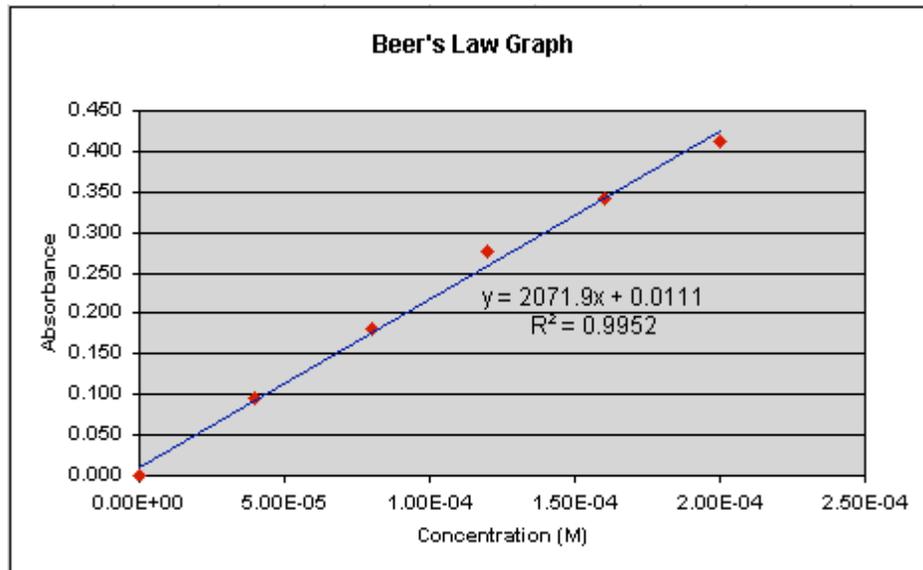


Figure 1. Calibration curve for yeast concentration as a function of absorbance measured at 520 nm.

## 1.5 Tables

The purpose of providing tables in the text is to enable an organized presentation of data. First, remember that the tables in themselves do not convey anything. Do not assume that the reader will automatically read and interpret the table. The author needs to discuss the important facts regarding each table in the texts. All tables should be called out in the text. The table called out should then appear at the first possible place after it has been called out. This would typically be in the same page or the following page. If more than one table is called out in the same page, then the tables should follow sequentially.

All tables should be numbered sequentially using Arabic numerals continuously throughout the text, starting with Table 1 for the first table without including chapter

numbers . If the caption is more than one sentence in length it should be single-spaced and left justified. The title or caption goes above the table. (In MS Word, you can use the captions feature for this.) There is a period after the table number in the caption.

Captions should be left justified, centered above the table, and employ sentence case (i.e. only the first word capitalized and with a period at the end). There should be a period followed by two spaces after the figure number in the caption. When referring to a table in the text, always capitalize it, as in “ Table shows the data we are interested in”. Never use “the Table below shows...”, because you might move the table somewhere else or onto the next page. References to tables in the text should be by Table Number, and not page number.

All tables should be located so that they conform to the margins set by the SJSU Thesis Guidelines; however the columns of the table should generally be left-justified. The title of a table should be descriptive of the contents of the table. Titles such as "Experimental Results", "Temperature Measurements", and other non-descriptive generic titles should not be used.

Tables have rows and columns. In general, each row and column should have a title describing the contents of that row or column. In some cases, only the columns will need descriptive titles. The units of the numbers contained in the table should be shown clearly. If each column has a separate measure, then the unit should be specified with the column titles. If measurements in the whole table has only one unit, then this can be specified either at the top of the table, or along with the title. When appropriate, measurement errors should also be included.

Table 1. Numerical calculations for sundial angles.

Location	Latitude	Longitude	f
Palo Alto, CA	37°11'	42°9'	37°
New Orleans, LA	28°61'	54°12'	58°

## 1.6 Equations

All equations are to be numbered continuously, beginning with Equation 1.

Equation label and number should be inserted on the same line that the equation begins.

You can use the “insert caption” feature of Word to do this. The equation should be set-off from the text as a separate paragraph and centered. When referring to the equation, use a capital E. For example, Equation 1 shows the Ohm’s Law. All variables should be defined in the text.

$$V = iR \qquad \text{Equation 1}$$

where V is voltage, i is current, and R is resistance.

## 1.7 References

### 1.7.1 Citations

The purpose of providing references is so that the interested reader can locate that particular reference. References are numbered sequentially, in order of appearance, at the end of the text, excluding appendices, and are intended to correspond directly to the text.

A reference is used to let the reader know where you obtained a certain piece of information or opinion. It is extremely important to reference the information, because

the reader has to assume that any un-referenced information or opinion is actually that of the writer.

References should be referred to in the text by inserting them in brackets [1,2]. If you have multiple references for the same paragraph or idea it can also be done as shown [3-10]. If you refer to the same reference later in the text, use the already assigned reference number [3].

Note that MS Word does provide an “EndNote” feature which can be very useful. However the formatting of these “Endnotes” does not follow our guidelines. There is a way to utilize the feature and modify it to meet the guidelines, but such instructions are beyond the scope of this document.

When referring to researchers in the text, refer to them by last name unless to distinguish between more than one researcher with the same last name. Avoid using gender specific pronouns (“he/his/she/her”). If there is more than one author on the paper, refer to the researchers using *et al.* or and co-workers or similar. For example, “Lee *et al.* found that stress increased in the last half of the semester [1].”

### 1.7.2 Print Reference Formats

CME theses follow modified guidelines based on the Materials Research Society publication guidelines. Article *titles* are to be included immediately following the author list, in quotes and italicized. Note that a comma appears at the end of the title, *inside the end-quote mark*, as seen below. The full range of pages should be specified. Examples for journal articles, books and proceedings are given below. References for electronic

citations are given in Section 1.7.3. Note that the reference listing is different for journal articles (#1 and #2, below) and articles from conference proceedings (#4 and #5 below).

1. E.L. Allen, G.S. Selvaduray and M.M. McNeil, "*How to write a really good thesis*," *J. Irreproducible Results*, **56**, 2003-2005 (1987).
2. A.B. Smith, "*Thin metal film properties*," *Phys. Rev.* **41**, 852-853 (1932).
3. H. Lamb, *Hydrodynamics*, 6th ed. (Cambridge Univ. Press. Cambridge, England, 1940), pp. 573-645.
4. T.R. Jervis, J-P. Hirvonen, M. Nastasi and M.R. Cohen, "*Ion beam modification of bicycle spokes*," in *Beam-Solid Interactions: Physical Phenomena*, edited by J.A. Knapp, P. Borgesen, and R.A. Zuhr (Mater. Res. Soc. Symp. Proc. 157, Pittsburgh, PA, 1990), pp. 395-400.
5. S. Cho and E. Allen, "*Heat Sink Attachments for PBGA*," *Procs. Electronic Components Conf.*, 1985, pp. 23-34.
6. J. Smith, Seagate Corporation, *private communication (September 2001)*.
7. T. Lazarus, Dead Sea Research, *unpublished results (Jan 1502)*.
8. R. Lee, *Effect of Plasma Gas Flow Rate on Surface Porosity of ABS Plastic*, Masters Thesis, San Jose State University, San Jose, California.
9. Williams, Dave. 2005. "Screw less clip mounted computer drive". U.S. Patent 6,885,550, filed August 24, 2000, and issued April 26, 2005\*.

\*If you only have the patent issue date, it is ok to only include that date.

The phrases *et al.* and *ibid* should not be used in any reference. Instead, all authors of the reference should be listed. Notice that in reference Examples 5 and 6 above that it is possible to reference unpublished information, but this should be used *very* sparingly.

Also notice some of the following punctuations in the examples given:

- There *is no* space between a person's two initials.
- There *is* a space between a person's last initial and their last name.
- There is one space after commas.
- There should be no comma before the "and" for the last author. (See reference 4 above.)

- There is a comma inside the title end-quote.
- Bold-face the journal volume.
- For a journal reference, there is a space between page numbers and (year).
- There is a period at the end of the reference.
- Book titles are underlined.
- Article titles are italicized.

### 1.7.3 Electronic References

An agreed and fixed standard for electronic references does not yet exist, so the CME guidelines adapt the Harvard System that is currently used for books and journals. Information needed for a complete and accurate electronic reference should include:

- Author's name and initials (if more than one, list them). If there is no individual author, as with printed sources, use organization or part of an organization, i.e. whoever owns the website. Unknown or un-attributed websites are not acceptable references.

- Year of publication (if there is no date listed, then you should state that the reference is undated or has no date). The date should ideally be the last date that the page/item was updated.
- Title of the document being cited, with an edition or version number if later than the first. The title of a web page will normally be the main heading on the page, or in the blue strip at the top of the screen.
- Medium or Type of resource - to show that this is not a printed book or article.
- Location - URL, address, etc - wherever the user has to go to in order to locate the document in question.
- Date accessed.

Example:

Style: Author, Initials (year). *Document title* [Online]. Available at location of document (accessed date).

Department of Education & Skills (2003). *The future of higher education* [Online]. Available at <http://www.dfes.gov.uk/hestrategy/> (accessed 9 June 2003). Posted pdf file.

If you only need a section of an electronic source, reference that section:

Cormack, A. *Web Security, section 2.1* [Online]. Available at [http://www.jisc.ac.uk/pub00/nesli\\_evaluation\\_report.html](http://www.jisc.ac.uk/pub00/nesli_evaluation_report.html) (accessed 1 December 2000). WWW Article.

## 1.8 Bibliography

This section contains references that were of general use, but were not referred to specifically in the text of the thesis. They should be listed alphabetically, by author, and should follow the format used for references. Typically the bibliography will consist of textbooks and review articles. Often a thesis will not have a bibliography separate from the reference list. If you do include a bibliography, it should be alphabetized by last name.

## 1.9 Units

The preferred system of units to be used is the SI. Metric units are acceptable. If units other than SI or MKS units, such as the British-American units, are to be used, then the SI or MKS equivalent should be in the text, with the other units provided within parentheses.

No matter what set of units are used, you should use a consistent set of units in the thesis. There should be a space between the magnitude and units such as 10 kg.

Whenever a number is less than one a zero must always precede the decimal point, e.g.

0.01 mg.

When a number starts a sentence it must always be spelled out, e.g. Thirty kilograms of copper were used in Experiment 1. Or you could rearrange your sentence such as: Experiment 1 was run with 30 kg copper. See other guidelines for writing units at <http://euler9.tripod.com/analysis/si.html>. Note that you can write the full name of units out to avoid any confusion.

#### 1.10 Footnotes

A footnote is a clarification or more detailed explanation of something in the text. Continuity of the text should not be dependent on the footnote; it is provided purely as extra information for the reader. The contents of the footnote could either be more advanced than the general technical level of the text, or more basic, such as the derivation of an equation like Fick's 2nd Law.

Footnotes should appear at the bottom of the page in which they are referred to. If more than one footnote is called out in a page, then all of these should appear in the same page. A footnote from one page may spill over to the bottom of the next page, taking up whatever necessary space at the bottom of that page.

Do not use numbers for footnotes. It can be very confusing, especially since references use numbers (Arabic numerals). Symbols, such as \* or + can be used. The recommended symbol is the \*. When more than one footnote is called out in a page, use one, two, or three \*'s. Please note that the \*'s should be superscripts. You should not have many, or possibly any, footnotes in your thesis.

Office software generally has both footnoting and referencing (EndNotes) features that can be used to advantage in organizing your references, especially if you

start using it at the proposal stage. It does take some learning to make it work effectively, but the advantage is it is easy to generate and update the reference list as you go.

### 1.11 Capitalization

Headings, experiments, runs, appendices, sections, chapters, figures, tables and the like are all considered to be named once you give them a number or letter. Thus, when you refer to them in the text, they should be capitalized. For example, Experiment 9, Appendix A, Chapter Two, etc.

Common chemicals are not capitalized in the text when they are spelled out unless they start a sentence. e.g. All samples used in these experiments were copper that had been cleaned in sulfuric acid and dried in an nitrogen stream. You can also use the chemical symbol, e.g. All samples were made from Cu. However, you should be consistent and use one method or the other.

Acronyms, numbers, chemical symbols, or the like should not start a sentence. You need to rearrange the sentence so they do not start the sentence, or spell them out.

### 1.12 Other Miscellaneous Formats

Foreign words such as Latin, used in text should always be italicized. Also, abbreviations should always have a period at the end. Thus, the expression *et al.*, which is an abbreviation for the Latin expression *et alia*, meaning “and others,” should be italicized and have a period at the end.

### 1.13 Using MS Word

MS Word has a useful feature by which the user can define headings and subheadings, etc. This then allows you to generate a Table of Contents quite easily that it is easily changed whenever you change around your text. It is useful to write your thesis proposal in this format so that you can easily convert it to a thesis later on.

Notice that if you use the “Insert Captions” feature it is easy to keep track of moving figures and tables. When you want to refer to a table or figure use the "Insert Cross-reference” feature. This feature also allows you to generate a List of Figures or Tables with great ease.

You can use the Insert Tables command to make a List of Tables at the beginning of your document. Then if you move a table somewhere else, it will be re-numbered automatically as will everything else. Use the “Update fields” Option to re-number everything.

## CHAPTER TWO

### WHAT TO DO WITH YOUR THESIS AFTER IT IS WRITTEN

The Bulletin from the Graduate Studies office gives all the steps involved in printing, binding and circulating your thesis. Within the CME Department, the following guidelines apply:

*Give your advisor your final draft one month before your target defense date.*

Contact your Reading Committee Members at this time if you have not already been in regular communication with them. They are more likely to be able to accommodate your schedule if you keep in regular communication with them. Your initial draft must have been read by your advisor already before you can consider this a final draft. In some cases there may be two, three or ten previous drafts. *Your advisor has the ultimate authority on whether your thesis is ready for distribution.*

Give your adviser-approved final draft to the members of your reading committee at least two weeks prior to your scheduled defense date. Expect your committee members to have additional comments at the presentation. These changes may or may not require extensive re-writing, so be sure to allow enough time. Your committee members may be willing to sign the signature page, but your adviser will require a final copy before signing off on the thesis.

After your adviser and committee have approved the thesis, and signed the signature pages, submit it to Graduate Studies on regular paper (as described in the SJSU Thesis Guidelines document), along with the required originals of the signature page. This is your final draft. Provide an unbound copy of the final draft to your thesis advisor.

Provide a copy of the thesis title page and signature page to the CME program graduate coordinator. He/She needs this to certify that you have passed your “culminating experience” and are ready to graduate. You also need to submit to your graduate coordinator a list of all semesters you took 298/299, the grade you currently have in each, and your mailing address so that they can facilitate a grade change for those courses. Graduate Studies will require final corrections to typos and formatting if necessary. After Graduate Studies has approved the final submission of the thesis, provide a bound copy of the final thesis to all your committee members including your thesis advisor.

## APPENDIX A

You should only have an appendix if you have material that is too detailed or too long to go with the flow of the main document. For example, detailed calculations that not all readers would want to see. Alternatively, you may have background information or instructions that are not part of the experimental results but provide some additional understanding or resources for the reader. If you have only one Appendix then it is labeled Appendix; if you have more than one appendix they should be numbered Appendix A, Appendix B, etc. and each appendix should start on a new page, like a chapter.