

College of Engineering Writing & Communication Resource Center



1250 BELLFLOWER BLVD. LONG BEACH, CA 90840
VIVIAN ENGINEERING CENTER – 128B

MS Thesis/Project Workshop Handout

The Scope/Abstract

The Abstract

What? An abstract is a summary of your thesis, so it must include the most important elements of your thesis, such as *why*, *how*, *what*.

Why? Abstracts are important because they inform prospective readers the main points of your work. Because of this, it is important to write your abstract for a wide audience

Within your abstract, it is important to remember to include the following:

- Background
- Methods and Results
- Conclusion

The Abstract Must Include:

- Well-developed paragraphs
- An introduction, body, conclusion structure
- Chronologically follows the report
- Is readable to a wide audience

Abstract Background/Introduction

This section is an introduction of the study. It should include the goals of your project and background information that your reader should know. In your intro, you need the following:

- A hook: catches the reader's attention
- Background info: informs the reader of your topic

Abstract: Methods/Results or "Body"

For the body you will write about what you have discovered or claim to have discovered. In this section you will explain the methods you used in the order that they appear in your report. In the body, you will need the following:

- Methods: specific techniques taken
- Results: what you discovered

The Abstract: Conclusion

The conclusion is a quick summary about what your abstract has already claimed. It should be as clear and concise as possible. In your conclusion, you should include the following:

- Conclusion: summarizes what you found or claim to have found in your general topic.

The Abstract: What to Avoid

- referencing or citing other works
- the passive voice
- adding new information
- longer than 400 words
- using words that are uncommon

The Literature Review

What is it? A Literature Review is the crucial first step to writing your thesis/proposal.

It...

- Focuses on a particular area of research and question/issue you wish to address.
- Narrows in on content to concentrate only on truly relevant materials.
- Contains a thesis or statement of purpose.

Why is a Literature Review Necessary?

It...

- Places your area of research in the academic context by showing that there are gaps in knowledge in your field that merit a closer investigation.
- Demonstrates your work hasn't been previously done, ensuring your intellectual contribution is indeed original - the white space
- Demonstrates a critical approach to scholarship. Show you have analyzed and critiqued the theories or methodologies in the field and that you know the main arguments related to your topic.
 - Describes the existing or relevant literature on a topic and reflects a critical analysis of this research. It is *not* a comprehensive list of books and articles pertaining to a particular discipline or field of inquiry.
 - Demonstrates that you've read extensively in your field, have a thorough comprehension of your field, and are capable of intelligently and knowledgeably critiquing others' work.

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What does a Literature Review Do?

- The review traditionally provides a historical overview of the theory and the research literature, with a special emphasis on the literature specific to the thesis topic. It serves as well to support the argument/proposition behind your thesis, using evidence drawn from authorities or experts in your research field.
- **Your review of the literature may be**
 - stand-alone, or
 - embedded in the discussion, or
 - segmented into a series of chapters on several topics
- For this, discuss with your advisor which method would best suit your topic and your argument.
- It is possible that you will use a combination of both in order to accurately and persuasively communicate your thesis.
- The review must be shaped by a focus on key areas of interest, including research which provides a background to the topic.
- It should also **be selective**. A common mistake in writing the review is to comment on everything you have read regardless of its relevance.
- In your writing it is useful to **think of the review as a funnel** - start wide with the overview and then quickly narrow into discussing the research that relates to your specific topic.

How to Perform a Literature Review:

1. Create a Working Bibliography/Literature search

- Determine the available materials (what is out there?)
 - The most effective way to do this is to utilize the search engines in the library's engineering databases and search the key terms related to your topic.
- Prepare a preliminary list of books and articles to research
- Create a working bibliography where you will record the information which is most relevant to your topic.

2. Obtain the materials and read them carefully

- During the review process, these key questions will help shape your argument:
 - What is the current state of the field?
 - What have others done/published?
 - Is the material from a primary or secondary source? (issues on objectivity, bias)
 - What is missing from the literature?
 - What are the strengths and weaknesses of evidence obtained from the literature?

- Did the author clearly state the research question?
- What are the key components of the research design?
- Did the author(s) use the methods and techniques appropriately?
- Could other research designs have been used to study the same question? Would they have been better? How would the evidence be different?
- What did the results show? Did it contribute towards the improvement of engineering practice?

3. Select appropriate method to answer research question

- Based on the research you have gathered and the areas you have identified as lacking, that will enable you to develop your methodology/approach to your research.

What is a Methodology/Evidence?

- Deals with a set or sets of rules and/or procedure used to attain your stated objectives. A methodology is not necessarily the same as your own methods.
- Your methodology should link back to your literature review and explain why you chose your methods and the basis of your choice.
- Appropriateness depends on your research question or problem statement.
- The methodology should be a plan to set out what you want to do.

Methods vs Methodology:

Methods:

- Questionnaires
- Interviews
- Lab experimentation
- Photo/video documentation
- Remote sensing
- Simulations

Methodology:

- Qualitative, quantitative, or mix of both.
- Through a literature survey
- Data collection and sampling
- Data analysis

Qualitative: more descriptive approach that is investigative, ethnographic (people/culture), or anthropological. Can lead to new insights or understandings of a subject. It is performed with decision trees and comparative analysis. Usually time consuming, and not very common in scientific fields (engineering).

Quantitative: deals with numerical methods, statistics, numerical models, and cost/benefit analyses. It is usually more challenging, especially, if a new method is being used for the analysis. The methodology is more objective with hard data.

Conclusion

General and specific

- The conclusion synthesizes the introduction and body paragraphs by “sandwiching” both general points examined and specific points explored in the body paragraphs. The conclusion re-states, in summary, all of the main points.

Reinforce salient points

- No new information should be introduced in the conclusion since this is the forum designed to re-capitulate the body paragraphs after all discussion is complete. Avoid general afterthoughts or “fluff.” You should reinforce ideas expressed in the paper and leave the reader(s) with a clear idea of what the paper discussed. Include key ideas the audience should do or take away.
- **Start with your main point.** If you stated it in the introduction, restate the main point more fully. Do not restate word-for-word.
- **Add a new significance or application.** After stating your point, say why it’s significant. Imagine the reader asking, *So what?* or *Why should anybody care?*
- **Synthesize, don’t summarize your most salient points.** Don’t repeat the same points over again, but rather show how the points you made fit with your examples or data you collected to lead to your insights.
- **Provide recommendations or areas for further study.** Give out recommendations or suggestions for the reader to do if they want to follow-up on your research. *Is there further need for research, and if so, how?*

Formatting

Formatting Specifics for Each Discipline are found at these links:

- Civil—ASCE; <http://www.asce.org/Audience/Authors,--Editors/Books/General-Book-Information/Quick-Guide-to-Common-Types-of-Referenced-Material/>
- Computer Science—IEEE Computer Society; <http://www.computer.org/portal/web/publications/styleguide>
- Electrical—IEEE; http://www.ieee.org/documents/style_manual.pdf
- Mechanical & Aerospace—ASME; https://www.asme.org/shop/proceedings/conference-publications/references?cm_re=Author%20Guidelines-_-Left%20Navigation-_-References

THE BIG SIX: Important Formatting Requirements

- **Font Style**
 - Times Roman
 - Times New Roman
 - Courier
 - Courier New
- **Font Size = 12 point**
- **Exceptions:**

- Within a table, font style must match text but font size may be 10 to 12 point
- Within a figure, font style is unrestricted and font size must be legible
- Within the appendices, font style and font size are unrestricted

Margins

- 1 ½ inch left margin is used throughout the manuscript
- 1 inch bottom and right margins are used throughout the manuscript
- 1 inch top margin is used for most pages of the manuscript
- 2 inch top margin is used for the first page of the sections listed on the right
- The easiest way to create a 2 inch top margin is to space down from the existing 1 inch top margin. Hit ENTER key 3 times (using double line spacing) or 5 times (using single line spacing) for the extra inch of blank space

Spacing Within the Text

- Within the text of the abstract, acknowledgements and all chapters, use two (2) spaces after punctuation at the end of sentences; commonly this is a period, but it could be a question mark or exclamation mark
- Also, two (2) spaces are required after colons in text, titles or subheads
- This rule does not apply to citations in footnotes or references list
- *This rule requirement may change for Spring 2016 submissions.*

Paragraph Format Requirements

- All text should be formatted as paragraphs with consistent indentation for the first line and left justification only
- Bullet points are not allowed
- Numbered items use paragraph format with NO uniform left indentation

Format Numbered Items Like Paragraphs

1. Microsoft Word automatically formats numbered items with uniform left indentation.
2. The University Guidelines Manual requires paragraph format.
3. University Guidelines Manual wins! Indent the first line of each item, including the number, like a paragraph, and start all other lines at the left margin.

Uniform Double Line Requirements

- Uniform spacing between lines of text with no extra blank space between paragraphs or before and after titles and subheads.
- To create uniform double line spacing, select text above and below the gap in the text.
- Then click on the Page Layout tab and click on the little arrow underneath the spacing settings to bring up the Paragraph dialog box. (Figure 1)

- In the Paragraph dialog box, set Line spacing to “Double” and set the Spacing boxes (marked Before and After) to “0 pt”. (Figure 2)

Formatting Page Number Requirements

- Page numbers are centered at the bottom of the page and positioned just above the one inch bottom margin.
- To change the position of page numbers, go to the Insert tab and click on Footer.
- Then click on Edit Footer near the bottom of the dialog box.
- A new menu bar, “Header & Footer Tools,” will appear at the top of the screen. Look for the Footer from Bottom setting and change setting to 0.9 inch.

Common Formatting Errors

- Each department has a difference citation style. For example Civil Engineers use ASCE and Electrical Engineers use IEEE. (Links found on handout).
- A page with text must be full of text. A blank space cannot be left at the bottom of a page of text because a figure or table is too big to fit in that space. Instead, text that follows the table or figure should be moved up to fill that empty space.
- When using numbers in brackets to cite sources, the citations are numbered in the order that that source if first cited. That is, [1] should be the first bracketed number in the text.
- The bracketed numbers cannot be used as if they are words in the sentence. For example:
 - An important discovery was made by [1]. INCORRECT
 - An important discovery was made by Watts [1]. CORRECT

NEED MORE HELP?

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