

Writing a Thesis or Dissertation for University of Idaho with LaTeX

A Thesis
Presented in Partial Fulfillment of the Requirements for the
Degree of Master of Science
with a
Major in Nuclear Engineering
in the
College of Graduate Studies
University of Idaho
by
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Approved by:
Major Professor: Major Professor, Ph.D.
Committee Members: Committee One, Ph.D.; Committee Two, Ph.D.
Department Administrator: Department Chair, Ph.D.

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Abstract

This is a template that will help you use \LaTeX to write your thesis. The document will talk a lot about the functionality and conveniences of this template but is not a standalone tutorial. If you need to learn how to use \LaTeX , check out Dr. Trefor Bassett. He has a great playlist on YouTube to teach you the basics and much more. If you happened across this document without the template, you can find more at <https://github.com/sjroot97/UI-Thesis-Dissertation>.

Acknowledgements

Dr. Borrelli made me learn \LaTeX when I took his Nuclear Engineering basics class. I am glad to be free of the frustrations of Microsoft Word. When I started writing my thesis [1], the official template provided by CoGS was deprecated. It now longer exists. I brought it up to what I understand is modern standards. My thesis got accepted with minimal hacky fixes. Hopefully this will help you pass your formatting check too.

This work and my coursework was completed under a Graduate Fellowship funded by Nuclear Regulatory Commission (NRC).

Dedication

To my mother, <Mom>, who planted and nurtured my love of science. To my father, coach, foreman, tech support, and #1 fan, <Dad>, who kindled my engineering spirit. To my cats, <Name> and <Name>, who stayed up with me all those long nights. Thank you for your endless support.

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List of Codes

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List of Acronyms

CoGS College of Graduate Studies.

NRC Nuclear Regulatory Commission.

Statement of Contribution

Chapter 3 is a multi-authored article that was submitted to and accepted by <Journal> [2]. The author of this thesis was the primary author of the article, <writing the original draft manuscript and conceptualizing the methodology>. The co-authors offered the following valuable collaborative efforts in support of publication of the work:

- **Second Author** Revisions, support and guidance
- **Third Author** Writing, revisions, and response to reviewer comments, assistance in conceptualization, support in development and verification, case study selection
- **Last Author** Revisions, guidance and supervision, case study selection

I am grateful for their contributions.

Chapter 1: Introduction

This .pdf was rendered by the main .tex file, Thesis.tex. This file is formatted primarily by the document class ‘UIdaho’, which is provided by ./rcs/uIdaho.cls. Thesis.tex contains very little of the text that makes up this template. Instead, it inputs files for each chapter. For a document as large as a thesis or dissertation usually ends up being, this makes keeping track of everything a lot easier. The text for the frontmatter (everything before this chapter) is contained in the folder ./Frontmatter/. Each of the chapters are contained in ./Chapters/, and the appendices are contained in ./Appendix/. This chapter, Chapter 1, can be found at ./Chapters/Introduction.tex, and will tell you how to change the template into your thesis.

1.1 Cover Page

The first thing you need to do is update your cover page. This is done in Thesis.tex, by updating the ‘Thesis Information’, as shown by Figure 1.1. This information is populated to form the cover page by the \thesistitlepage macro. If you are a Ph.D student, be sure to change the \doctype and \thesisdegree.

```

26 % Thesis Information
27 \title{Writing a Thesis or Dissertation\for
University of Idaho with LaTeX}
28 \author{Joe Vandal}
29 \doctype{Thesis}
30 %\doctype{Dissertation}
31 \thesisdegree{Master of Science}
32 %\thesisdegree{Doctor of Philosophy}
33 \major{Nuclear Engineering}
34 \advisor{Major Professor, Ph.D.}
35 \committee{Committee One, Ph.D.; Committee Two, Ph.D.}
36 \deptadmin{Department Chair, Ph.D.}
37 \graddate{May 2024}
38 %

```

Figure 1.1: Change the cover page info in this section of Thesis.tex. This information is automatically populated by the UIdaho document class.

1.2 MetaData

The next thing to do is to update your .pdf metadata. This is done by updating the fields displayed by Figure 1.2

```

49 % Configure the PDF output (Most of this is optional,
it just adds metadata to the PDF)
50 \hypersetup{% pdftex
51 pdfauthor=Joe Vandal,
52 pdftitle=UI Thesis Template,
53 pdfsubject={Thesis LaTeX Template},
54 pdfkeywords={Idaho;Thesis;Dissertation;LaTeX Template}
55 pdfproducer={ShareLatex}, % e.g ShareLatex
56 pdfcreator={pdflatex},
57 pdfprintscaling={AppDefault}}

```

Figure 1.2: Change the information in this section of Thesis.tex. This information tells the pdf reader what to display as the document title, among other things.

1.3 Everything Else

Now, its as simple as writing your abstract, acknowledgements, dedication, statement of contribution (if applicable), your chapters, and any appendices you may choose to include. Good luck!

Chapter 2: Body

paragraph enumerate

Equations reactions Acronyms Nuclides Footnotes Citations Figures Tikz PGF Tables Codes

Chapter 3: A Paper that is Also a Thesis Chapter

If any of your chapters are also multi-authored publications, be sure to fill out the Statement of Contribution in the frontmatter. If all of your chapters are standalone, remove the Statement of Contribution by commenting out the `\include{Frontmatter/Contribution}` command in `Thesis.tex`. If you have multiple chapters which have been published, modify the statement of contribution to reflect this.

If your chapter has been submitted but the publishing process is not complete, you can add a ‘note’ to the bibtex info in `References.bib` to state that the work is under review, under revision, in press, etc.

Chapter 4: Conclusions

As you finish your thesis, you will want to prepare it for the formatting check. One useful feature is the ‘show frame’ option. This will draw lines to show the margins, headspace, footspace, etc. You can toggle it on and off by going under `uidaho.cls` and uncommenting `%\RequirePackage[showframe]{geometry}` and commenting out `\RequirePackage{geometry}`. You need to be sure that nothing at all prints in the margin or CoGS will make you change it. Once you ensure this, you can submit your thesis for a formatting check. Doing this before you defend will allow you more time to address any formatting issues you are made aware of.

If you wish to make your slides in \LaTeX , there is a template called `Defense.tex` in this repository that uses the ‘beamer’ class. This is convenient as it allows you to reuse code from your thesis, and any updates to things like figures will automatically be implemented in both places. Good luck on your presentation.

References

- [1] Root, Sam J., 2024 5. Dynamic System Modeling and PID Controller Design for a Molten Salt Microreactor. Master's thesis, University of Idaho.
- [2] Vandal, Joe, Author, Second, Author, Third, Author, Last, 2023. A paper that is also a thesis chapter. Journal of Idaho 100, 123456. ISSN 0029-9876. doi:10.1016/j.nucengdes.2023.123456.

Appendix A: Codes

The package ‘slither’ in the ./rcs folder provides code blocks for python or serpent. If you need to include other languages I am sure you can find a package to do that. Slither could probably be modified with some level of difficulty to include MCNP code as well. The documentation may help. <https://github.com/sjroot97/Slither-Latex-package>

A.1 Python

Code 1: Hello!

```
1 print("Hello World") #comment
2 try:
3     a=2/x
4 except ZeroDivisionError:
5     print('undefined')
```

Inline codes like `import numpy` or `x =1`

Or, include code in the best way, by inputing it from a file.

Code 2: F strings

```
1 x =4
2 print(f"The numeral four: {x}")
3 #comment
```


A.2 Serpent

Code 3: Fuel

```

1  /*
2  Enriched (4%) Uranium Metal
3  */
4  mat fuel      -10.1
5  92235.03c    -0.04
6  92238.03c    -0.96
7  'string'
```

Inline codes like `surf s1 sqc 0.0 0.0 100.0`.

Or input from a file.

Code 4: Physics Cards

```

1  %./cards/physics.txt
2  % _____Physics cards_____
3  set power 1e7 %10MWth
4  set pop 1000000 500 100 1
5  %dep daystep 1 1 1 1 1
6  %set mcvol 10000000
7  %set nbuf 10
8  %set printm 1 1e-10
9  %set inventory "all"
10 %set pcc leli 10 10
11 set acelib "endfb71r1_p2" "endfb71r1" "jeff31u"
12 %set declib "sss_jeff31.dec"
13 %set nfylib "sss_jeff31.nfy"
14 det EnergyDetector dm Salt4 de EnergyGrid
15 ene EnergyGrid 3 500 1e-11 2e1
```