

A Basic LaTeX Template to Write Your Thesis/Dissertation for Texas Tech  
University

by

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A Dissertation

In

Your Program of Study

Submitted to the Graduate Faculty  
of Texas Tech University in  
Partial Fulfillment of  
the Requirements for  
the Degree of

Doctor of Philosophy

Approved

Dr. Committee Chair's Name  
Chair of Committee

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Dean of the Graduate School

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## **Acknowledgements**

I am thankful that LaTeX has made writing my dissertation an easy and painless experience.

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## Abstract

I am going to fill this abstract with gibberish fillers.

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Nullam vel eros id metus luctus commodo eget sed elit. Fusce dictum posuere dolor, id eleifend velit consequat quis. Integer imperdiet nibh at nisi feugiat, sit amet vulputate risus posuere. Vivamus pretium eros blandit, bibendum lectus id, faucibus enim. Pellentesque eu urna porta, finibus lorem quis, pretium nisl. Integer non sem a urna pulvinar gravida. Aenean sit amet varius nunc, in laoreet neque.

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## Chapter 1

### Introduction

A dissertation/thesis is a document detailing all your original research work performed towards earning your degree. It usually consists of the following chapters:

1. Introduction
2. Literature Review
3. Methodology
4. Results and Discussion
5. Conclusion

To begin a new chapter, you simply use the command `\chapter{}`. To boldface text, you use the command `\chapter{}`. The space inside the curly braces `{}` is where you type in the text that you want to display as the chapter title. Therefore, to print the chapter title “Introduction” in boldface, you would use `\chapter{\textbf{Introduction}}`.

A chapter can have sections and subsections. A new section is created by using the `\section{}` command and a subsection is created by using the `\subsection{}` command. Examples can be seen in Chapter 2.

This template is formatted according to the Texas Tech Graduate School’s dissertation formatting guidelines (as of June 14, 2018).



## Chapter 2

### Equations and Indentation

#### 2.1 Equations

Equations do not need to be captioned, but as they can frequently be referred to in your text, you should give your equations a label. A simple equation is written using the `\begin{equation}` [Equation here] `\end{equation}` format as in the following example:

$$\mathbf{F} = k\mathbf{x} \tag{2.1}$$

As shown in Eq. 2.1, the equation is automatically labeled and if you add another equation above Eq. 2.1, then all the equation numbers in the text will be automatically updated. To create boldface type in equations, the `\bm{}` command was used instead of `\textbf{}`.

Let us say that you wish to list multiple equations under the same labeling and that the “equal to” sign should be lined up in a straight line:

$$\begin{aligned} \delta_1 &= \frac{PL_1}{AE} \\ \delta_2 &= \frac{PL_2}{AE} \end{aligned} \tag{2.2}$$

Eq. 2.2 was created using the following code:

```
\begin{equation}
\begin{aligned}
\label{eq:rel_disp}
\delta_{1} &= \frac{PL_{1}}{AE} \\
\delta_{2} &= \frac{PL_{2}}{AE}
\end{aligned}
\end{equation}
```

The `\begin{aligned}` tells LaTeX to line up any text preceded by the ampersand sign in a straight line. In this case, `&=` tells LaTeX to line up the “equal to” signs. Any command that opens with `\begin{}` must close with `\end{}`. The `\\` in Eq. 2.2 tells LaTeX to skip to the next line. The `\frac{ }{ }` shows you how to write fractions. You are left to determine how the subscripts were created.

Mathematical equations can also be written in-line. This means that if you need to write out a formula that is only germane to the discussion at that particular time and nowhere else, then you could consider writing an in-line formula. For example,  `$\bm{M} = \bm{R} \times \bm{F}$`  will produce the result  $\boldsymbol{M} = \boldsymbol{R} \times \boldsymbol{F}$ .

Some points that you should consider when writing equations to distinguish between different types of mathematical quantities:

- Scalar variables are italicized but not boldfaced.
- Vectors are boldfaced.
- LaTeX supports Greek letters. Use Google to your advantage to learn how to get the needed Greek letters such as  $\varepsilon$ ,  $\theta$ ,  $\alpha$ ,  $\sigma$ ,  $\Delta$  etc.

To write a matrix, you should look up for LaTeX documentation on Google for `Bmatrix`, `bmatrix`, `pmatrix`, etc. For example:

```
\begin{equation}
\label{eq:ex_matrix}
A =
\begin{bmatrix}
1 & 2 & 3 \\
4 & 5 & 6 \\
7 & 8 & 9
\end{bmatrix}
\end{equation}
```

produces:

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad (2.3)$$

LaTeX also supports integrals. An example of an integral is as follows:

```
\begin{equation}
\label{eq:integral}
A = \int_0^a x^2 \, dx
\end{equation}
```

$$A = \int_0^a x^2 \, dx \quad (2.4)$$

The slash sign (`\`) provides a space between  $x^2$  and  $dx$ . More cool stuff about how to write equations in LaTeX can be found here: <https://en.wikibooks.org/wiki/LaTeX/Mathematics>.

## 2.2 Indentation

The template is set to justified alignment by default because LaTeX is able to hyphenate words that are too long to contain on the same line. The Graduate School recommends that your text be left aligned if you are using Microsoft Word because the justified alignment will create large, awkward spaces in between words.

By default, this template causes the first line of each new paragraph to be indented. If you do not want LaTeX to indent text for specific reasons (such as the case in Eq. 2.3 where the text "produces" preceding the equation is not indented), then you will use the `\noindent` command. For example:

```
\noindent Lorem ipsum dolor sit amet,
consectetur adipiscing elit.
```

Etiam in velit congue,  
mollis metus ac,  
sodales justo. Nulla porttitor bibendum.

will produce the following output:

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Etiam in velit congue,  
mollis metus ac, sodales justo. Nulla porttitor bibendum.

## Chapter 3

### Citations

#### 3.1 Citation Styles

There is a variety of citation styles available to you. You should consult your committee on which style you should use. This template uses the Chicago style referencing, and the style file can be found in the ZIP file that contains the `.cls` file. You should see the `chicago.sty` and `chicago.bst` files.

#### 3.2 How to Cite in Text

The following commands are available to you using the Chicago style of referencing:

- `\cite{citation_label}` produces the author-year citation inside parentheses, e.g. `\cite{sample_masters}` results in “(Doe, 1990)”. However, if there are multiple authors, then `\citeN` provides the names of all authors, e.g. `\cite{cervenka_2016}` results in (Cervenka, Schultz, Stahl, and Knowles, 2016).
- `\citeN{citation_label}` produces the author’s name and the year inside parentheses, e.g. `\citeN{sample_phd_diss}` “Smith (2014) observed that...”. Similar to `\cite`, `\citeN{cervenka_2016}` results in “Cervenka, Schultz, Stahl, and Knowles (2016) ...”
- If you want to shorten the citations to include just the first author and the abbreviations “et al.”, use `\shortcite{}` and `\shortciteN{}`. E.g. `\shortcite{cervenka_2016}` results in “(Cervenka et al., 2016)” while `\shortciteN{cervenka_2016}` gives “Cervenka et al. (2016)”. If the reference you cite has two authors only, then both authors’ names will be listed. E.g. `\shortciteN{minor_1990}` results in “Minor and Reznik (1990)”.

When a reference is cited in the text, that reference will automatically

be added to the list of References at the back matter portion of the dissertation/thesis. If they are not cited in the text, they will not appear in your list of references. For example, the book by A.E.H. Love is not listed in the list of references, but if you type `\cite{love_treatise_1944}` anywhere in the text, then you will see Love's book listed in the references.

The bibliography requires that all your references be listed in a `.bib` file. A sample of this file is provided in the ZIP file. You can generate your `.bib` file using services such as Endnote and Zotero.

## Chapter 4

### Tables and Figures

Tables and figures are commonly included in dissertations/theses. I prefer to place my tables and figures in separate pages rather than in between text. Sometimes, the table is too large to be placed in portrait orientation, so you must tell LaTeX to display the table in landscape orientation. If the text is too large to fit inside a page, you can tell LaTeX to make the font size smaller. No source code will be provided verbatim here, so if you wish to know how to build tables and insert figures, go to the `.tex` file and see how the tables and figures are inserted. Comments are also provided in the file for clarity. Note that whenever a table or figure is added, it gets listed in the list of tables or list figures as well.

Tables and figures can also be labeled and referenced like equation numbers as well. See examples in Tables 4.1 and 4.2. Figure 4.1 shows the Double T logo. You can insert figures in PDF, JPG and PNG formats. TIFF format is not supported.

Table 4.1. Geometric properties

| Beam thickness, t | Beam width, W | Beam length, L | Diameter, D |
|-------------------|---------------|----------------|-------------|
| mm                | mm            | mm             | mm          |
| 16                | 200           | 1000           | 100         |
|                   |               |                | 200         |
|                   |               | 1500           | 100         |
|                   |               |                | 200         |
| 10                | 400           | 1000           | 100         |
|                   |               |                | 200         |
|                   |               | 2000           | 100         |
|                   |               |                | 200         |



**Table 4.2.** Coefficients

| Units            | Dimensionless number | Slope    | A                | B                | C   |
|------------------|----------------------|----------|------------------|------------------|-----|
| N·m <sup>2</sup> | 0.5                  | <i>x</i> | 10 <sup>-8</sup> | 10 <sup>-4</sup> | 1.1 |
|                  |                      | <i>y</i> | 10 <sup>-8</sup> | 10 <sup>-4</sup> | 1.3 |
|                  |                      | <i>z</i> | 10 <sup>-7</sup> | 10 <sup>-4</sup> | 1.5 |
|                  |                      | <i>A</i> | 10 <sup>-8</sup> | 10 <sup>-4</sup> | 1.1 |



**Figure 4.1.** The Double T symbol

## **Chapter 5**

### **Conclusion**

This template is not enough to teach you everything you need to write your dissertation/thesis properly. However, Google is your best friend in finding answers, and I have relied on Google heavily for solutions and managed to write my dissertation using this template modified to reflect Graduate School's formatting guidelines. I am a LaTeX novice, but I still managed. Good luck in your dissertation/thesis!

## References

- Cervenka, J., J. Schultz, D. Stahl, and J. Knowles (2016). Strength of Point-Supported Glass - Influence of Stress Concentrations and Drilling Defects in Monolithic Tempered Glass Plates. In *2016 World Congress*, Los Angeles, pp. 2362–2369. Facade Tectonics Institute.
- Doe, B. (1990). A Sample Master’s Thesis Title Here. Master’s thesis, Texas Tech University, Lubbock, TX.
- Minor, J. and P. Reznik (1990). Failure Strengths of Laminated Glass. *ASCE Journal of Structural Engineering* 116, 1030–1039.
- Smith, J. (2014). *A Sample Ph.D. Dissertation Title Here*. Ph. D. thesis, Texas Tech University, Lubbock, TX.

## Appendix A

### Double T Signature



**Figure A.1.** Double T signature

## **Appendix B**

### **Another Double T**



**Figure B.1.** Another Double T