LaTeX Graduate Thesis Template

by

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A template submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy.
(or some other very fancy degree)

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This template was made using only free and open source software (FOSS) except for images not created by the author. It is typeset entirely using the LaTeX Documentation System.

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February 9, 2012

The amount of it, be sure, is merely a scream, but sometimes a scream is better than a thesis.

Ralph Waldo Emerson

Abstract

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed libero elit, sollicitudin dignissim accumsan aliquam, eleifend et massa. Suspendisse porta luctus metus, vitae pellentesque ante porttitor ut. Etiam id magna sit amet metus dignissim imperdiet eget a enim. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In placerat, nunc ut volutpat aliquet, nunc sem blandit dui, nec hendrerit justo augue non mauris. Donec non enim in nibh rutrum mollis a sit amet nisl. Praesent augue lacus, eleifend at malesuada eget, rutrum ut est. Suspendisse at arcu nunc. Donec congue pretium nisi ac sodales. Duis aliquam urna eget elit luctus ut feugiat diam lacinia. Quisque libero mi, gravida a elementum non, dictum vitae lorem.

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Dedication

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Acknowledgements

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Nullam purus ipsum, dapibus eget rhoncus eu, aliquet id felis. Phasellus ultrices, dolor sed sollicitudin interdum, diam mi consequat magna, at feugiat nisl quam in purus. Nulla mauris augue, hendrerit eu malesuada sit amet, ornare et est. Sed pulvinar justo sit amet dui accumsan fringilla. Praesent augue est, sagittis bibendum posuere sit amet, sodales id mauris. Nulla dapibus eleifend malesuada. Maecenas consequat eleifend sem, et dapibus erat cursus a.

Donec metus magna, laoreet tempor hendrerit ut, volutpat at augue. Vivamus at vestibulum nisl. Donec elit augue, pulvinar ac rhoncus vitae, euismod tristique quam. Etiam in nisl justo. Phasellus eu sem sed purus lacinia rutrum id sed lorem. Cras neque tortor, rutrum ut pulvinar eget, vehicula eget lacus. Etiam pretium metus metus.

Vivamus velit nulla, ultrices a ultrices vel, rhoncus nec dui. Praesent accumsan libero eu tellus feugiat sodales. Donec et quam a diam eleifend ultricies semper nec justo. Cras euismod fermentum tellus, vitae tincidunt enim sodales id. Proin ultrices tellus at felis imperdiet nec tempor diam accumsan. Curabitur et posuere magna. Phasellus ultricies, orci vel mattis adipiscing, nulla elit semper odio, id sollicitudin purus sapien a ligula. Proin porta hendrerit justo quis venenatis. Integer et iaculis urna. Nulla ut justo ante.

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Chapter 1

Introduction

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This template is free as in free beer and free speech. It comes with no warranty of any kind and I am not responsible for any damage that may occur to your computer. I am also not responsible for anything that happens to your thesis when using this template. Use at your own risk!

This manual was made using the template that you just downloaded. All the source files are included so you can recompile, modify, and deconstruct any part of it. Text that is this color and style indicates that I am talking about this document you are reading. I believe in learning by doing [1] so I suggest you follow along and review the source code while reading.

1.1 Motivation

If you're reading this then you're probably like me and you use LaTeX every day for writing. There is no better solution for academic documents and that is why you want to use it to write your thesis or dissertation. This does not mean that writing a large document is easy (with or without LaTeX), especially if you're starting from scratch.

This template will hopefully serve as a guide for you to complete your thesis using the excellent tools that LaTeX provides. The end result is (in my opinion) elegant and understated, but highly customizable so it can take

any shape you like. You want the format of your thesis to be transparent so that your content can stand out and be appreciated by the reader.

This template is the result of many hours writing my own thesis and mucking around with LaTeX to get the exact design I wanted. It will help you along the very difficult path of writing your most important academic text.

1.2 Features

These are the core features I wanted this template to have. All of them are pretty standard LaTeX stuff but it's worth mentioning them in this context.

Readability: You get all the well designed features automatically built into LaTeX. By using the `book` class with standard page layouts, you get traditional and well established rules for page width, line spacing, etc. It is very easy to modify these if you want to – for instance, using the right package or uncommenting a line.

Portability: It is designed to run on any computer, operating system, and platform with only a moderately recent TeX installation and a minimal amount of standard packages.

Modularity: It is organized in such a way that you can very quickly add or remove chapters, appendices, title pages, etc. without needing to delete or modify any of your content. You can safely modify specific content without risking other parts of your document.

Modifiability: It is very easy to customize this template. The bulk of the configuration options are located in one file and you can radically change the appearance of your thesis by commenting or uncommenting a couple of lines.

1.2.1 A Note On Operating Systems

I use GNU/Linux and a full installation of TeXLive so everything is set to work with Unix-like systems. If you use Microsoft Windows or some other TeX distribution you may need to change directory paths, upgrade packages, etc. Users of Unix-like systems will also have access to the very useful `make-thesis.sh` bash script I have provided. It compiles the main `thesis` file several times so the BibTeX references and lists appear correctly

in the produced PDF. I believe that some LaTeX editors do this automatically (like TeXShop) so it is more convenient for those of us that use the command line. It also moves all the `.aux`, `.log`, `.toc`, etc. files to the `temp/` directory. Windows users will most likely have to do this by hand.

The `make-thesis.sh` script is provided only as an optional tool. Use at your own risk and **NEVER** run as root or in any other directory!

1.3 Future Work

The `xcolor` package allows hex color codes and has more predefined colors included – both advantages over the `color` package.

I had completed my thesis by the time I realized that there there is a more advanced class available, the `memoir` [2] class. It is newer than `book` and has a ton of configuration options. It would eliminate a significant amount of packages and hacks I used here, particularly for the table of contents, chapter headings, and page headers. It is probably not as widespread so I decided to stick with `book` for the time being.

I have also been working for some time with the XeTeX typesetting system and it has several advantages [3, 4] over LaTeX and TeX. Using additional fonts or system fonts with LaTeX is very tricky business. I used the excellent Bitstream Charter font for my thesis because there is already a package for LaTeX that enables it. XeTeX alleviates this problem and allows you to use your font of choice, including expert fonts [5] with advanced features.

1.4 Credits

I inherited my first version of this template from my predecessor's thesis, Dr. José Luis Cabellos Quiróz, which I then restructured and modified. I realized that his thesis was based on a template created by Matthieu Herrb (matthieu@laas.fr) that he had downloaded. I liked the way Matthieu's template looked so I modified and simplified the code considerably, used less packages, reimplemented the standard *book* class, and pretty much redid most of the template while maintaining a final result inspired by his.

Chapter 2

The Main Files

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This template requires 3 files:

1. The `thesis.tex` file, which is the master control file. This is the file you will compile to produce your document,
2. the `base/definitions.tex` file, which contains most of the packages and definitions of the template, and
3. the `base/fancyheaders.tex` file, which contains the header design for the main matter of the document. This file can be omitted if you are not interested in having headers.

These three files work together to shape your thesis. They can be combined into a single file but I explain the rationale for not doing this later on in this manual.

In this chapter I will analyze these important files that are needed to compile your thesis correctly. These files are not content files – those are up to you. We will discuss those files and the way they are organized in the next chapter.

2.1 The thesis File

This is the file you compile to produce your final document. This is the file that contains information about your specific document. It does not have much in it besides your personal info (for PDF properties) but acts as the master control file for all your content. You can view it in full in Appendix A. You can make a new copy from there if you ever lose it.

A few specific packages are loaded here. These are mostly packages that you may want to change or that you might not use at all. More general packages are reserved for the `definitions` file that I talk about in section 2.2

I'll review the `thesis.tex` file that came with (and also produces) this manual; I recommend opening it and following along.

2.1.1 The Preamble

```
\documentclass[letterpaper,11pt,openany]{book}
```

The start of any LaTeX document. You can change your default paper size, font size, and more.

If you live on the other side of the pond you'll probably want to choose `a4paper`. The `openany` option permits chapters to start on either recto or verso pages, as opposed to starting only on recto pages. This will easily reduce your page count by 5 or 6 pages for a long document (don't waste paper!). You can additionally add the `draft` option to compile much faster and see where you have overfull lines.

```
\input{base/definitions}% Packages and new defintions
\includexmp{base/CC_Attribution-NonCommercial-ShareAlike_3.0_Unported}
% Licensing XMP metadata
\hypersetup{% PDF display options
    pdftitle={\LaTeX{} Graduate Thesis Template},
    pdfauthor={Sean M. Anderson},
    pdfsubject={A very modular LaTeX template that is appropriate
    for a masters or doctoral thesis.},
    pdfkeywords={masters} {doctoral} {phd} {thesis} {dissertation} {latex}}
```

Here we input the `definitions.tex` file that specifies most of the packages used – it has to come in early. The `xmpincl` package allows us to append a

valid XMP metadata file, located in the `base/` directory.

These `hypersetup` options are unique to your document. They will show up in the PDF properties and on the title bar, etc. Not strictly necessary but very handy.

You can see the PDF information for this document by reviewing the properties, usually under `file` → `properties`. You'll see that they correspond exactly to what's written above.

```
\usepackage[T1]{fontenc}% T1 font encoding for special characters.
\usepackage{lmodern}% Better Latin Modern font.
```

This part specifies font information. *Latin Modern* is the default LaTeX font and is adequate for most applications. You can change this to any font package that you desire bearing in mind that you should choose a font appropriate for your content. You can review all available fonts at the LaTeX Font Catalogue.

```
%\usepackage{draftwatermark}% Add watermark to background
%\SetWatermarkText{DRAFT}
%\SetWatermarkScale{2}
%\SetWatermarkLightness{0.87}
%\SetWatermarkFontSize{2cm}
```

Enabling these options produces a watermark in the background of your thesis [6]. I highly recommend watermarking your drafts to avoid confusion with final revisions.

```
%\usepackage{showkeys}% Shows all \label values for quick troubleshooting

%\includeonly{}% Select individual chapters for quicker drafts
```

These two options are very useful for drafting. The first will display all the `\label{...}` commands in your document. Useful when you need to troubleshoot citations or section references.

The second enables you to isolate and compile only one part of your whole document. There are two ways to load files in a TeX file: the `\include{...}` and `\input{...}` commands. The `\includeonly{...}` let you to choose between any file you've loaded with `\include{...}`. Files loaded with

\input{...} are not affected by this option. You can compile documents much faster with this command enabled.

Let's say we're working on our first chapter, introduction.tex. We uncomment this line and add the {content/main/introduction} argument – this excludes every other file in the document except the definitions and fancyheaders files that are loaded with the \input{...} command. The resulting PDF contains only one chapter which you can review and send to your advisor, for example.

2.1.2 The Front Matter

```
\begin{document}
\dominitoc

\frontmatter
\include{content/front/titlepage_generic}
\include{content/front/copyright}
\include{content/front/signature_page}
\include{content/front/epigraph}
\include{content/front/abstract}
\include{content/front/dedication}
\include{content/front/acknowledgments}

\tableofcontents
%\listoffigures
%\listoftables
```

This marks the start of our content. The \dominitoc command enables the mini table of contents located at the beginning of each chapter. Note that it does not actually produce anything here.

The \frontmatter command tells LaTeX that we're starting our front matter. Front matter pages do not have headers or footers and use roman numerals for page numbering. Each of our front matter pages are included separately. Modifying one will have no effect on the others and you can add or remove pages to conform to school regulations. The final set of commands enables the different lists that are needed for a thesis.

This document has seven front matter files located in the content/front/ directory. The lists are generated by LaTeX so we don't need separate files for them.

You'll notice that both the lists of tables and figures are commented out. By default, each list starts on a new page – a tremendous waste of paper if you

have only have one or two figures or tables. Check your school guidelines to find out what lists are required.

2.1.3 The Main Matter

```
\mainmatter
\input{base/fancyheaders}
\include{content/main/introduction}
\include{content/main/work}
\include{content/main/directories}

\appendix
\include{content/main/app-thes}
\include{content/main/app-defs}
```

Here we tell LaTeX that the main matter starts, using whatever headers and footers you choose. We include the `fancyheaders` file so that our main matter will now use our custom headers and load the appendices in the exact same way. Note that appendices are not considered back matter and always go directly after the main matter.

The three chapters and two appendices are all located in the `content/main/` directory. Please note and appreciate the very creative file and folder names.

2.1.4 The Back Matter

```
\backmatter
\include{content/back/bibliography}
\include{content/back/vita}
\end{document}
```

We load the back matter files in the same way we have described in the last couple of sections. The final `\end{document}` command brings our `thesis` file to an end.

This document includes a bibliography page and a short autobiographical statement called a *vita*. I'll talk more about the bibliography in the next chapter.

2.2 The `definitions` File

The `definitions.tex` file (you can copy Appendix B if you ever lose it) is what makes this template run. This is where all the essential packages and

definitions are specified. It contains no content or personal data; it's just a very large preamble.

All the "general" packages are loaded here; by this I mean packages typically used in most of your documents. You could write the whole thing directly in the `thesis` file but I think this is a far more elegant solution. If you're tend to use a specific package in most of your documents, add it here and keep the `thesis` file as clean as possible.

2.2.1 Packages and Options

```
\usepackage{xmpincl}% For including licensing XMP metadata
\usepackage{amsmath}% AMS Math
\usepackage{amssymb}% AMS Symbol
\usepackage{parskip}% No indent, line skipping paragraph breaks.
\usepackage{float}% For better control of figure placement and additional floats
```

We start by specifying standalone packages. Most users will be familiar with both of the AMS packages that provide advanced math typesetting and a whole range of useful symbols. Your don't need these if you don't plan on writing equations or formulæ.

`xmpincl` is the package that includes our license metadata that gets specified in the `thesis` file (see section 2.1.1). The `parskip` package changes the traditional paragraph breaks to the more modern non-indented, line-skipping style. Some people hate this so you can just comment this line to undo it. Lastly, the `float` package [7] provides some essential functionality for float placement and increases the number of floats you can have in your document.

```
\usepackage{fancyhdr}% Fancy headers and footers.
\pagestyle{empty}% Empty for \frontmatter

\usepackage{graphicx}% You know it, baby!
\graphicspath{{.}{content/images/}}
```

The `fancyhdr` package is used for defining custom headers and footers. The `\pagestyle{empty}` command makes sure we don't have any headers or page numbers in the front matter. You may comment this line out if you like having ugly lowercase roman numerals loitering around in your front matter pages.

The `graphicx` packages lets us to insert all kinds of graphical data into our documents. The `\graphicspath{...}` command sets the root directory for our images. This reduces typing and lets us store our images and organize them all in one place. The directory I have specified is `content/images/`.

```
\usepackage{color}% For link colors
\definecolor{linkcol}{rgb}{0,0,0.4}
\definecolor{citecol}{rgb}{0.5,0,0}
\definecolor{emerald}{rgb}{0,0.5,0.5}
```

The `color` package enables other colors beyond the default LaTeX choices. Three color definitions follow with their RGB coordinates from 0 to 1. The first color is a dark blue (similar to navy) used for internal and external links. The second is a dark red used for citations.

The third is similar to emerald green and is the color used in this paragraph. Since you probably won't use it in your thesis feel free to delete this definition.

```
\usepackage[bookmarksdepth=2,colorlinks=true,linkcolor=linkcol,citecolor=citecol,
filecolor=magenta,urlcolor=linkcol,breaklinks=true]{hyperref}
\urlstyle{same}% For all links within the document and URLs
```

These options establish the behavior of the `hyperref` package. They work in conjunction with the personal data you inputted using the `hypersetup` command in the `thesis` file.

You can consult the very excellent `hyperref` documentation [8] for a description of each option.

```
\usepackage{minitoc}% Mini table of contents for each chapter
\setcounter{minitocdepth}{2}

\usepackage[nottoc,notlof,notlot]{tocbibind}% Fine tuning table of contents
\setcounter{tocdepth}{2}% Number of levels shown in TOC
\setcounter{secnumdepth}{3}% Levels of section numbering
\addtocontents{toc}{\protect\thispagestyle{empty}}% Ensures no page
\addtocontents{lof}{\protect\thispagestyle{empty}}% numbers on toc,
\addtocontents{lot}{\protect\thispagestyle{empty}}% lof, or lot
```

This section is all about the table of contents. The `minitoc` package enables the mini table of contents that appears at the beginning of each chapter. The `tocbibind` package lets us to select what we don't want to appear in

the TOC – the three options (nottoc, notlof, and notlot) disallow all lists from appearing.

The depth of each list is specified by the appropriate setcounter commands. A depth of 2 indicates that sections and subsections will appear, but not subsubsections. If you don't want subsubsections to have numbers, reduce secnumdepth to {2}. Use your best judgment when it comes to list depths. It may be wise to include subsubsections if you have a lot of them with important content. Remember, you organize your content and create these lists for your readers. You want them to be able to access and understand your writing but without confusing them with sections within sections within sections.

This manual has no subsubsections at all otherwise you'd see their four identifying section numbers.

The last three commands remove page numbers from the lists. They are *fragile* commands that break often – they did not give me any trouble but be aware.

You can verify that only subsections and higher appear in all the TOCs of this document, and that the TOC does not appear in the TOC (I know, I know. . .).

2.2.2 Defintions

We move on to the portion of the file that contains our new definitions. I personally tend to avoid these – just more things to break in my humble opinion. However, sometimes they do simplify life considerably and can even save you from having to load an extra package or two.

```
% Centered page environment for frontmatter.
% Credit to Matthieu Herrb (matthieu@laas.fr)
\newenvironment{vcenterpage}
{\newpage\vspace*{\fill}\thispagestyle{empty}\renewcommand{\headrulewidth}{0pt}}
{\vspace*{\fill}}

% Changes line spacing to be slightly easier to read
%\renewcommand{\baselinestretch}{1.05}
```

The first bit introduces a piece of code written by Matthieu Herrb. This environment creates vertically centered text. Very useful for some of the front matter pages.

The second part is for changing line spacing. Some universities and schools

want your thesis to look like shit and want you to use double spacing. You can uncomment this line and set `\baselinestretch` from 1.05 to 2, though I suggest you fight this tooth and nail.

```
% Modifies book class defaults for better looking
% chapter pages with small caps titles
\makeatletter
\def\@makechapterhead#1{%
  \vspace*{1\p@}%
  {\parindent \z@ \raggedright \normalfont
    \ifnum \c@secnumdepth >\m@ne
      \if@mainmatter
        \LARGE\sc \@chapapp\space \thechapter
        \par\nobreak
        \vskip 10\p@
      \fi
    \fi
    \interlinepenalty\@M
    \Huge \sc #1\par\nobreak
    \vskip 25\p@
  }}
\def\@makeschapterhead#1{%
  \vspace*{1\p@}%
  {\parindent \z@ \raggedright
    \normalfont
    \interlinepenalty\@M
    \Huge \sc  #1\par\nobreak
    \vskip 30\p@
  }}
\makeatother
```

The last portion is some code I pieced together from various sources. It changes the spacing (the white space before and after), the style, and size of the chapter headings. The most notable change comes from the `\sc` command which implements the *small caps* style for both the chapter name (the part that says Chapter 1, etc.) and the chapter title (the actual name of the chapter).

You can verify the differences if you recompile this document with the above code commented out. They will be very obvious.

This code can be replaced by one of several packages, namely `titlesec` and `sectsty`. However, I think this template already has enough packages as it is. You can try either to see if you like the result better.

2.3 The fancyheaders File

This file uses a pretty standard approach for nice looking headers using the `fancyheaders` package. The documentation [9] has most of this code in it so I'll just include it below for completeness.

```
% Fancy header style options for each page
\pagestyle{fancy}% Sets fancy header and footer
\fancyhead{}% Resets headers
\fancyfoot{}% and footers

\fancyhead[LE,RO]{\thepage}% Page number left on even and right on odd pages
\fancyhead[RE]{\itshape\nouppercase{\leftmark}}% Chapter right on even pages
\fancyhead[LO]{\itshape\nouppercase{\rightmark}}% Section left on odd pages
\renewcommand{\headrulewidth}{0.5pt}

\fancypagestyle{plain}{
  \fancyhead{}
  \fancyfoot{}
  \renewcommand{\headrulewidth}{0pt}
}

% No headers on empty pages before new chapter
\makeatletter
\def\cleardoublepage{\clearpage\if@twoside \ifodd\c@page\else
    \hbox{}
    \thispagestyle{plain}
    \newpage
    \if@twocolumn\hbox{}\newpage\fi\fi\fi}
```

This code could have been easily integrated into the definitions file, but I found it useful to invoke it exactly where I wanted it rather than have it loaded from the very beginning.

Chapter 3

Directories and Content

Contents

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This template is designed to be very organized and intuitive. It works in a directory tree that will help you properly organize all your content. You won't need to hunt down your files because everything is explicitly named and inconspicuous.

This directory tree may appear cumbersome for short documents like this one, but it really shines for longer, more complicated ones. You should take some time to view each folder and its contents. This manual is located in the root directory.

This directory tree was made to work with any Unix-like operating system, but should work with little modification under other systems. We start in the root directory which you extracted somewhere on your computer. Located here is the `thesis.tex` file that we discussed in the last chapter. This directory is also where your final PDF document will be created unless you specify something else. All files are referenced from here because they are all called from the `thesis` file.

In this chapter I will discuss the directory tree and how to use your files with it. You can refer to table 3.1 for a quick overview.

3.1 The base/ Directory

The `base/` directory contains the files that are needed to compile your thesis that only contain formatting or indirect content. We discussed two of these

base/		definitions.tex fancyheaders.tex *BibTEX database* *License metadata*
content/	back/	*back matter files, bibliography, vita, etc.*
	front/	*front matter files, abstract, title pages, etc.*
	images/	*all image files sorted in directories by chapter*
	main/	*main matter files, chapters and appendices*
temp/		*toc, aux, log files, etc.*

Table 3.1: The directory tree summarized.

files in the last chapter, the `definitions.tex` and `fancyheaders.tex` files. Besides those two, your license metadata (if you have one) and your BibTEX database are located here.

Files in the base directory mostly contain preamble code. They do not need any commands of this type:

```
\documentclass{...}
\begin{document}
\chapter{...}
\section{...}
.
.
.
\end{document}
```

The metadata should be an XMP file in order to work with the *xmpincl* package. The BibTEX database is totally standard.

This manual uses a Creative Commons license, and you can find that metadata in this directory along with the sample BibTEX database used. These two files are `CC_Attribution-NonCommercial-ShareAlike_3.0_Unported.xmp` and `thesis.bib`, respectively. You can view the licensing information in the PDF properties.

3.2 The content/ Directory

As the name implies, the `content/` directory holds all your thesis content from front to back matter. This is the stuff you actually see in your final

document – images, text, tables, title pages, etc. It is also subdivided into several directories.

back/ houses all the stuff that goes in the back matter like the bibliography or an epilogue, if your thesis is really epic.

front/ houses all the stuff that goes in the front matter. This can add a good 10 pages to your total document length. All the bureaucratic stuff will go here so make sure you find out what your school requirements are.

images/ is where all your images go. They can be organized however you like, but I think by part or chapter makes the most sense. This acts as the root directory for your images thanks to the `\graphicspath{...}` command (see section 2.2.1).

main/ holds all the chapter files. This will be your most accessed directory. I name the files with generic names, such as `introduction.tex`, `conclusion.tex`, `electrons.tex`, etc. Avoid names like *chapter 1*, *first*, etc. to avoid confusion if you need to rearrange your chapters.

This document contains a full array of front matter pages, three chapters, two appendices, two back matter pages, and a bunch of images. They are all located in the appropriate directories in `content/`.

The `back/` directory has two files, `bibliography.tex` and `vita.tex`. The first simply refers BibTEX to the appropriate database file in the `base/` directory. It also specifies the bibliography style to be used. We talked about the second file in section 2.1.4.

The `front/` directory contains 7 files that correspond to the following – the abstract, acknowledgements, copyright page, dedication, epigraph, signature page, and title page. The files are appropriately named. They appear in the order specified in the `thesis.tex` file.

Front matter files should have all formatting commands included with no preamble. You can use the `vcenterpage` environment (see section 2.2.2). Format them as if each one were its own document.

The `images/` directory houses several directories named after different parts or chapters of the document. There is one PDF image in the `frontmatter/` folder (zoom in all you like) and a bitmap image in the `your_stuff/` folder which you can appreciate in figure 3.1.

You'll notice that most are PDF files that aren't even images at all! They correspond to all the colored code sections in this chapter and the last. Even though they don't contain graphical data I still use them as figures.

The benefit of using PDF vector images is obvious – they render sharp at any magnification. Render in PDF if you are making your own graphs or figures. This way your final document will be sharp no matter how big it appears on screen.

Figure 3.1: The cake is a not a lie! Image credit: Lammas at http://lammas.deviantart.com/

The `main/` directory has all our chapter files. Chapter 1 corresponds to the `introduction.tex` file, chapter 2 to `the_files.tex`, and chapter 3 to `your_stuff.tex`. `app-defs.tex` and `app-thes.tex` are the appendices.

Your chapter files should look like any other LaTeX document except without any preamble, like

```
\chapter{...}
\minitoc
\section{...}
\subsection{...}
.
.
.
```

and so on. The `\minitoc` command creates the mini TOC at the beginning of the chapter.

3.3 The `temp/` Directory

This directory is only used if you compiled your thesis with the included *make-thesis.sh* file. It automatically moves all `.aux`, `.log`, `.toc`, etc. files here. You probably will never need to access this directory, except perhaps for reading the log file after an error.

Appendix A

```
\documentclass[letterpaper,11pt,openany]{book}

\input{base/definitions}% Packages and new defintions
\includexmp{base/CC_Attribution-NonCommercial-ShareAlike_3.0_Unported}
% Licensing XMP metadata
\hypersetup{% PDF display options
    pdftitle={\LaTeX{} Graduate Thesis Template},
    pdfauthor={Sean M. Anderson},
    pdfsubject={A very modular LaTeX template that is appropriate
    for a masters or doctoral thesis.},
    pdfkeywords={masters} {doctoral} {phd} {thesis} {dissertation} {latex}}

\usepackage[T1]{fontenc}% T1 font encoding for special characters.
\usepackage{lmodern}% Better Latin Modern font.

%\usepackage{draftwatermark}% Add watermark to background
%\SetWatermarkText{DRAFT}
%\SetWatermarkScale{2}
%\SetWatermarkLightness{0.87}
%\SetWatermarkFontSize{2cm}

%\usepackage{showkeys}% Shows all \label values for quick troubleshooting

%\includeonly{}% Select individual chapters for quicker drafts

\begin{document}
\dominitoc

\frontmatter
\include{content/front/titlepage_generic}
\include{content/front/copyright}
\include{content/front/signature_page}
\include{content/front/epigraph}
\include{content/front/abstract}
\include{content/front/dedication}
\include{content/front/acknowledgments}

\tableofcontents
%\listoffigures
%\listoftables

\mainmatter
\input{base/fancyheaders}
\include{content/main/introduction}
\include{content/main/work}
\include{content/main/directories}

\appendix
\include{content/main/app-thes}
\include{content/main/app-defs}

\backmatter
\include{content/back/bibliography}
\include{content/back/vita}
\end{document}
```

Appendix B

```
\usepackage{xmpincl}% For including licensing XMP metadata
\usepackage{amsmath}% AMS Math
\usepackage{amssymb}% AMS Symbol
\usepackage{parskip}% No indent, line skipping paragraph breaks
\usepackage{float}% For better control of figure placement and additional floats

\usepackage{fancyhdr}% Fancy headers and footers.
\pagestyle{empty}% Empty for \frontmatter

\usepackage{graphicx}% You know it, baby!
\graphicspath{{.}{content/images/}}

\usepackage{color}% For link colors
\definecolor{linkcol}{rgb}{0,0,0.4}
\definecolor{citecol}{rgb}{0.5,0,0}
\definecolor{emerald}{rgb}{0,0.5,0.5}

\usepackage[bookmarksdepth=2,colorlinks=true,linkcolor=linkcol,
citecolor=citecol,filecolor=magenta,urlcolor=linkcol,breaklinks=true]{hyperref}
\urlstyle{same}% For all links within the document and URLs

\usepackage{minitoc}% Mini table of contents for each chapter
\setcounter{minitocdepth}{2}

\usepackage[nottoc,notlof,notlot]{tocbibind}% Fine tuning table of contents
\setcounter{tocdepth}{2}% Number of levels shown in TOC
\setcounter{secnumdepth}{3}% Levels of section numbering
\addtocontents{toc}{\protect\thispagestyle{empty}}% Ensures no page
\addtocontents{lof}{\protect\thispagestyle{empty}}% numbers on toc,
\addtocontents{lot}{\protect\thispagestyle{empty}}% lof, or lot

%------------------------------ Definitions ---------------------------------%

% Centered page environment for frontmatter.
% Credit to Matthieu Herrb (matthieu@laas.fr)
\newenvironment{vcenterpage}
{\newpage\vspace*{\fill}\thispagestyle{empty}\renewcommand{\headrulewidth}{0pt}}
{\vspace*{\fill}}

% Changes line spacing to be slightly easier to read
%\renewcommand{\baselinestretch}{1.05}

% Modifies book class defaults for better looking
% chapter pages with small caps titles
\makeatletter
\def\@makechapterhead#1{%
  \vspace*{1\p@}%
  {\parindent \z@ \raggedright \normalfont
    \ifnum \c@secnumdepth >\m@ne
      \if@mainmatter
        \LARGE\sc \@chapapp\space \thechapter
        \par\nobreak
        \vskip 10\p@
      \fi
    \fi
    \interlinepenalty\@M
    \Huge \sc #1\par\nobreak
    \vskip 25\p@
  }}
\def\@makeschapterhead#1{%
  \vspace*{1\p@}%
  {\parindent \z@ \raggedright
    \normalfont
    \interlinepenalty\@M
    \Huge \sc  #1\par\nobreak
    \vskip 30\p@
  }}
\makeatother
```

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Vita

Sean Anderson was born in San Francisco, California in 1984. Born to restless parents, he spent a good part of his youth traveling between the United States, Mexico, and Guatemala, where his mother is from. Since then, Mexico has never been far from his heart.

He entered the University of Alabama in Hunstville in 2002, under the tutelage of Dr. Don Gregory. In 2006 he graduated magna cum laude with a degree in physics and a minor in mathematics. That same year marked the beginning of a 3 and a half year break to pursue various artistic interests.

He spent most of 2007 dancing tango and photographing Buenos Aires, Argentina. 2008 marked the return to Mexico, where he helped start the family business until 2009.

In 2010 he began his masters degree in optical science at the Centro de Investigaciones en Óptica in León, Mexico with Dr. Ramón Carriles as his advisor. This thesis marks the culmination of that work and was completed on January 16, 2012.

He is currently continuing on to pursue his Ph.D. in theoretical surface optics with an emphasis in scientific computing with the guidance of Dr. Bernardo Mendoza. His primary interests are the development and usage of free and open source software, GNU/Linux, and parallel computing applied towards solving various scientific problems.