\LATEX\ Thesis Class for University of Colorado

Bruce Fast
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The Graduate School of the University of Colorado specifies \cite{1} just how Master’s theses and Doctoral dissertations should be organized and formatted. The file “\texttt{thesis.cls}” contains the definitions needed to make the \LaTeX\ \texttt{thesis} class format your thesis to conform to these specifications. If your computer does not recognize \texttt{thesis} class, you can download the necessary files from

\begin{verbatim}
http://www.Colorado.EDU/ITS/docs/latex
\end{verbatim}

Thesis class does not work with old versions of \LaTeX\ (e.g., \LaTeX\ 2.09), only with \LaTeX\ 2\epsilon and future versions. It was originally written by John P. Weiss and tested on many theses in spring 1998. All the prologue pages of the thesis (everything before chapter 1) are generated by \LaTeX\ using the information you type in the \texttt{prologue commands} \cite{2}. The \texttt{style options} \cite{3} for \texttt{thesis} class allow you to choose from among some permitted variations in the look of your thesis, especially how headings are formatted and numbered. Some \LaTeX\ commands which work with \texttt{report} class have been disabled in \texttt{thesis} class, while other commands have been added or altered \cite{4}.

\section{Overview}

The overall structure of a thesis’ main *.tex file, using \texttt{thesis} class, should be like this:

\begin{verbatim}
documentclass[\options]\{thesis\}
\begin{document}
\prologue\ commands
\end{document}
\end{verbatim}

\begin{verbatim}
main text in chapters, then bibliography, then appendix
\end{document}
\end{verbatim}

Thesis Class is a variation of the basic \texttt{report} class of \LaTeX\ 2\epsilon, so it takes many of the same options. The simplest two options, “\texttt{11pt}” and “\texttt{12pt}”, change the font size from the default 10-point. Other options have been defined for \texttt{thesis} class to control elements of style within the restrictions of the Grad School specifications. Otherwise, a thesis can use all \LaTeX\ macros just as described in the references \cite{2, 3}.

The figure on page 2 shows the contents of a fictitious thesis file, \texttt{mythesis.tex}, that uses the \LaTeX\ \texttt{thesis} class. The main elements of a thesis are shown in correct order. The main text of a thesis, as illustrated in the figure, is actually typed into separate .tex files, which are included in the proper order using the \texttt{\input} macro. The optional appendix sections come \texttt{after} the bibliography.

\section{Prologue Commands}

At the beginning of every University of Colorado thesis are a series of special “prologue” pages, including the titlepage, abstract page, and signature page. These will be generated automatically if you provide the necessary information.
The popular 3-dimensional version of Tic-Tac-Toe was marketed years ago as a box game. Anyone can now download the same game in any number of forms. Easily extended to higher dimensions, it is quickly obvious that the size must be increased from three to make it a winning strategy in five dimensions has not been proven. To others, it's a test of skill and

\begin{itemize}
\item a good offense will always
\item effective offense involves
\item when in doubt, block
\end{itemize}

To my friends on the playground.
2.1 Required information

Below are the commands you must use in the preamble before the \begin{document} command. They can be entered in any order. If you forget to put any of these in the preamble, \LaTeX{} will generate an error.

- \texttt{\textbackslash title\{\ldots\}}
  The title of your thesis. Don’t explicitly break the lines using the “\" command; let \LaTeX{} do it.

- \texttt{\textbackslash author\{ first \ middle \} \{ last \}}
  Be sure to remember and divide your name as shown above.

- \texttt{\textbackslash advisor\{ title \} \{ name \}}
  Your advisor’s full name and title. The name should be in the usual order (first, middle, last). The “title” is your advisor’s official university title, e.g., “Professor” or “Assistant Professor”.

- \texttt{\textbackslash reader\{ full name \}}
  The name of the second person who will sign your thesis. The name should be in the usual order (first, middle, last). If you have additional readers, use the optional commands \texttt{\textbackslash readerThree()} and \texttt{\textbackslash readerFour()} in the same way.

- \texttt{\textbackslash degree\{ long description \} \{ short description \}}
  The first argument is the long description of your degree, e.g., “Doctor of Philosophy” or “Masters of Science”. The second argument is the abbreviated description of the degree followed by the subject, e.g., “Ph.D., Biology”.

- \texttt{\textbackslash dept\{ designation \} \{ name \}}
  The department granting your degree. The first argument is the official university designation of the department, e.g., “Department of” or “College of” or “School of”. The second argument is the department name, e.g., “Mathematics”.

- \texttt{\textbackslash otherdegrees\{ \ldots \}}
  The list of other degrees you hold, as described in the Specifications [1]. Break lines using the “\" command.

- \texttt{\textbackslash abstract\{\OnePageChapter \ldots \}}
  Use this for your thesis abstract. In the body of the abstract you can include commands, math mode, multiple paragraphs, etc. Leave out the \texttt{\OnePageChapter} if your abstract runs over one page.

2.2 Optional prologue commands

The following commands are optional.

- \texttt{\textbackslash degreeyear\{\ldots\}}
  The year you receive your degree. If you don’t include this, \LaTeX{} will just use the current year.

- \texttt{\textbackslash dedication\{ title \} \{ \ldots \}}
  The dedication page. The first argument, the title, is optional. The second argument is the body of the dedication. Keep it all under one page. Do not use the command \texttt{\OnePageChapter} here, since the dedication page must not be numbered.
2.3 Prologue Page Numbering

The Graduate School requires that you not number the first page of every chapter, unless the chapter is only one page long, in which case, you must number it. Numbering of the pages of a chapter thus begins with the 2nd page unless you use the \texttt{\OnePageChapter} command. For example, you will probably use this command in your \texttt{abstract}{} and \texttt{acknowledgements}{} command unless either is longer than a single page. But do not use it in your dedication page, because that is never supposed to be numbered.

Three of the prologue sections are generated by \LaTeX{} and not created explicitly by you; the table of contents, list of figures, and list of tables. To indicate that any of these are only one page long, or nonexistent, use the following commands as needed.

\begin{verbatim}
\ToCisShort \emptyLoF \LoFisShort \emptyLoT \LoTisShort
\end{verbatim}

3 Style Options

There are three main style options: typewriterstyle, modernstyle, and defaultstyle, described in §3.2. Each is actually a specific combination of the following “base options”.

3.1 Base options

Each of the following nine base options controls a single aspect of the thesis’ appearance. You can use any combination of the following, e.g.,

\begin{verbatim}
\documentclass[plainhead,consecutivenumbering,inlineh4]{thesis}.
\end{verbatim}

- \texttt{consecutivenumbering} Changes the numbering style of figures, tables, and equations to consecutive numbering throughout the thesis. Otherwise (by default), figures and tables and equations are numbered first by chapter, then by appearance within the chapter. You would want to use this option if you have very few equations, figures, and tables in your thesis, or if they are all concentrated in a single chapter.

- \texttt{inlineh4} Inlines the “\texttt{\subsubsection{}}” heading into the beginning of the paragraph. By default, the heading is on a separate line and is left-justified.

- \texttt{nonumh4} Removes numbering from the “\texttt{\subsubsection{}}” heading. By default, the heading is numbered.

- \texttt{centerh1} Center the “\texttt{\section{}}” heading. The section number, however, remains left-justified. By default, \texttt{\section} headings are left-justified.
• chapterleft  Left-justifies "\chapter{}" headings. By default: \chapter headings are centered.
• chapup    Make all "\chapter{}" headings uppercase. By default, the case of the heading and its label aren’t altered.
• plainhead  Makes all headings use plain text. By default, all headings use boldface text.
• fixedheadsize  Makes all headings use the default text size. By default, \chapter{} and \section{} headings are printed in 12-point text, regardless what the default text size is.
• emph2underline  Changes the "\emph{...}" command so that it generates underlining instead of italics, and the "\em" command generates a warning. By default, both \em and \emph{} generate boldface instead of italics.

3.2 Main options
Thesis class provides three main options which are just special combinations of the base options listed above. Using one of these overrides all the base options.

• typewriterstyle  This is the style given as an example in the Graduate School’s thesis Specifications [1]. There is one uniform font size, and all headings are plain. Only chapter headings are numbered, and the text of the chapter heading is set in uppercase letters. Section headings are centered, and any heading below a subsection is inlined. It is the sum of the five base options numberchapteronly, emph2underline, plainhead, fixedheadsize, and chapup.

• modernstyle  This is a modification of the default style of the \report class. Headings are all in boldface, and chapter, section, and subsection headings are numbered. Section and subsection headings are left-justified. Subsubsection headings and below are inlined. Lastly, the size of the chapter and section headings aren’t as large as the default in the \report class. This option is the sum of two base options, inlinel4 and nonumb4.

• defaultstyle  This is virtually identical to modernstyle with one exception: subsubsections are now numbered and left-justified. It is equivalent to no options at all, i.e., it enforces all the stylistic defaults.

4 New and Altered Commands
4.1 Redefined Commands
Several \LaTeX commands defined for the \report class are redefined to provide different behavior in thesis class, conforming to the Specifications [1].

• \{\em ... \} and \emph{ ... }
The Graduate School forbids italicized text, except in certain specific circumstances, so the "\em" and "\emph{}" commands are redefined to produce boldface text. If you use the "typewriterstyle" class option, then underlined text is used instead.

• \begin{itemize} ... \end{itemize}
  \begin{enumerate} ... \end{enumerate}
The labels for both these lists are different from the \LaTeX report defaults.

• \newtheorem{...}{...}[...]
The text of the theorem will be in the default font, not italicized.
These environments have been changed so that they use single-spacing instead of double-spacing. The bibliography environment is defined to underline titles, rather than using italics or boldface, even when you don’t choose typewriterstyle.

The thesis class does not recognize optional arguments for these commands, nor their starred versions (e.g., \subsection*).

4.2 New Commands

The \texttt{\textbackslash begin{\textbackslash singlespace} \ldots \texttt{\textbackslash end{\textbackslash singlespace}}} environment, \texttt{\textbackslash begin{\textbackslash singlespace} \ldots \texttt{\textbackslash end{\textbackslash singlespace}}}, permits you to do single-spacing inside the abstract or body of the thesis, where the default is double-spacing. Two other commands, \texttt{\textbackslash singlespacing} and \texttt{\textbackslash doublespacing}, are provided as an inelegant but effective last-resort way to switch spacing modes.

Page numbering is something that isn’t fully programmed in the thesis class macros. In a thesis, one-page chapters must be numbered (except for the dedication page), and you must do this manually. Issue the \texttt{\OnePageChapter} command immediately after a \texttt{\textbackslash chapter} command if the chapter is only a page long. Page numbering in the automatically-generated prologue pages (contents page, etc.) is controlled with other commands, described in §2.3.

4.3 Obsolete Commands

Most of the formatting commands and length definitions possible in \LaTeX{} are disallowed in thesis class. For example, margins lengths are prescribed by the Grad School Specifications [1], so none of them may be redefined with the \texttt{\setlength{\ldots}} command.

In addition, many of the class options which are valid for report class are disallowed in thesis class: titlepage, notitlepage, twoside, twocolumn, landscape, legalpaper, a4paper, a5paper, b5paper, and executivepaper.

Finally, these four \LaTeX{} commands are disabled in thesis class, and will generate warning messages if you try to use them: \texttt{\index}, \texttt{\part}, \texttt{\twocolumn}, and \texttt{\part}.

References

