

A LATEX CLASS FOR TYPESETTING
UTD DISSERTATIONS AND THESES

by

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*This thesis class file
is dedicated to my students,
who suffered without a proper one
until the present time.*

A LATEX CLASS FOR TYPESETTING
UTD DISSERTATIONS AND THESES

by

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DISSERTATION

Presented to the Faculty of
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December 2012

PREFACE

This dissertation was produced in accordance with guidelines which permit the inclusion as part of the dissertation the text of an original paper or papers submitted for publication. The dissertation must still conform to all other requirements explained in the “Guide for the Preparation of Master’s Theses and Doctoral Dissertations at The University of Texas at Dallas.” It must include a comprehensive abstract, a full introduction and literature review, and a final overall conclusion. Additional material (procedural and design data as well as descriptions of equipment) must be provided in sufficient detail to allow a clear and precise judgment to be made of the importance and originality of the research reported.

It is acceptable for this dissertation to include as chapters authentic copies of papers already published, provided these meet type size, margin, and legibility requirements. In such cases, connecting texts which provide logical bridges between different manuscripts are mandatory. Where the student is not the sole author of a manuscript, the student is required to make an explicit statement in the introductory material to that manuscript describing the student’s contribution to the work and acknowledging the contribution of the other author(s). The signatures of the Supervising Committee which precede all other material in the dissertation attest to the accuracy of this statement.

A LATEX CLASS FOR TYPESETTING
UTD DISSERTATIONS AND THESES

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The University of Texas at Dallas, 2013

Supervising Professor: Austin J. Cunningham

This mock dissertation concerns the development and usage of a \LaTeX class file that eases the task of creating UTD theses and dissertations. The class file automatically creates margins, page headers and footers, page numbers, paragraph parameters, title pages, and table/figure captions consistent with the guidelines set forth by the UTD graduate school. In contrast to many prior works, care has been taken to respect relevant \LaTeX coding conventions and standards. This helps to maximize compatibility with other \LaTeX packages, and eases the incorporation of existing publication texts into a dissertation master document.

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CHAPTER 1

INTRODUCTION

This document demonstrates how to use the `utdthesis` document class. It is *not* a tutorial on L^AT_EX. The reader who is unfamiliar with L^AT_EX is urged to first invest at least a few hours learning the basics through the help of a guide. We recommend the one by Oetiker et al. (2011), though there are many others.

Being a demonstration, the source file of this document (`sample.tex`) contains example L^AT_EX code that you may use as a template. Authors should start with the source file and replace the various texts with content appropriate for their theses. In order to keep this document self-contained, chapter texts are in-lined into `sample.tex`; however, a real dissertation should probably organize them into separate files that are loaded by substituting the texts in `sample.tex` with `\input` or `\include`¹ macros.

Although this document summarizes many of the UTD dissertation formatting requirements, it is not a substitute for reading the *Guide for the Preparation of Master's Theses and Doctoral Dissertations at The University of Texas at Dallas* (UTD, 2013)² Wherever this document and the guide disagree, the guide takes precedence. You should also consult *A Manual for Writers of Research Papers, Theses, and Dissertations* (Turabian, 2007).

The rest of the sample dissertation proceeds as follows: Chapter 2 details the proper usage of macros provided by the class file. Chapter 3 concludes the sample dissertation. The appendix demonstrates the formatting of an appendix (optional).

¹If you use `\include`, be sure to put the `\chapter` command in the loaded file, not in the master file, so that chapter texts aren't separated from their titles by page breaks.

²At the time of this writing, the guide was last revised February 2013.

CHAPTER 2

USAGE INSTRUCTIONS

2.1 Initialization

The first line of your `.tex` file should be:

```
\documentclass[doublespacing]{utdthesis}
```

To create a dissertation whose lines are one-and-a-half-spaced instead of double-spaced, use `halfspacing` instead of `doublespacing`.

2.2 Loading Packages

Next, load any desired packages using `\usepackage` commands. Be sure to avoid packages that violate the UTD thesis formatting requirements. Here are some common conflicts:

- Do not load any packages that change the default font size (but you may change the default font face, as long as the entire dissertation uses the same font face).
- Do not load any packages that change the margins (e.g., `geometry`).
- Do not load any packages that change the page numbering, headers, or footers.
- Do not load any packages that change the formatting of chapter titles.
- Do not reformat the table of contents or the lists of figures or tables.
- Do not load any packages that change the formatting of captions for tables and figures.
- Only load `hyperref` if you are using pdf \LaTeX to generate PDF files directly. (Converting DVI files to PDFs results in poor-quality PDFs, and is therefore not recommended.)

However, here are some recommended packages that may help improve the quality of your dissertation, or help you meet the UTD formatting requirements:

- If you want to use a Times font instead of Computer Modern, load the appropriate package for your L^AT_EX (usually `times`, `mathptmx`, `tgtermes`, or `newtxtext/newtxmath`).
- If your dissertation contains math or theorems, the `amsmath`, `amssymb`, and `amsthm` packages are recommended.
- If you need to import graphic files for figures, use `graphicx`.
- To improve the appearance of web URLs (e.g., in references), use the `url` package.
- To typeset a large table or figure in landscape orientation, use the `rotating` package.
- The `microtype` package improves overall font appearance in a variety of ways. However, be careful with the options since some conflict with the UTD formatting requirements. (We recommend using only the default option settings.)
- If you use pdfL^AT_EX or pdfL^AT_EX to generate PDFs, the `hyperref` package adds many useful features. If you use it, make it the last package that you load, since it modifies the behavior of many other packages.

2.3 Dissertation Setup

Before the first page of the dissertation, you must use the following commands to identify the author, title, and type of the dissertation.

Specify your name as you'd like it to appear in title pages:

```
\author{Kevin W. Hamlen}
```

Specify your dissertation title. Use `\\` to create line breaks in multi-line titles.

```
\title{A LaTeX Class \\ For UTD Theses}
```

Specify whether your document is a dissertation (usually for a Ph.D.) or a thesis (usually for a Master's degree):

```
\thesistype{Dissertation} or \thesistype{Thesis}
```

Specify the full name of the degree for which you are a candidate:

```
\degreefull{Doctor of Philosophy}
```

Specify the degree's abbreviation. Do not include any periods.

```
\degreeabbr{PhD}
```

Specify the full name of the subject in which you are pursuing your degree (as specified by your department):

```
\subject{Computer Science}
```

Specify the month and year in which you expect to be awarded your degree:

```
\graduationmonth{August}
\graduationyear{2012}
```

Write a comma-separated list of the abbreviations of the degrees you already hold, *not including the degree for which you are a candidate*. Do not include any periods.

```
\prevdegrees{BS, MS}
```

List the members of your supervisory committee in the order that they should appear on the signature page. Use the * form of the command for committee chairs. All chairs should always come before all non-chairs, and the first member should always be a chair.

```
\committeemember*{Austin J. Cunningham}
\committeemember{Gopal Gupta}
\committeemember{Mark Spong}
\committeemember{David Daniel}
```

2.4 Preliminary Pages

The first command after the `\begin{document}` line should be `\frontmatter`. This sets up the page numbering style of the preliminary pages.

```
\begin{document}
\frontmatter
```

Create the signature page as the first page:

```
\signaturepage
```

If you want a copyright page, create it and specify the copyright date:

```
\copyrightpage{2012}
```

If for some reason the name on the copyright page should be different than the name given to the `\author` command, use: `\copyrightpage[your name]{year}`

If you wish, add a dedication page. End all but the last line with `\\`.

```
\begin{dedication}
For everyone \\
who helped me \\
write this.
\end{dedication}
```

Create the title page:

```
\maketitle
```

Consult your supervisor and the UTD guide on whether you need an acknowledgments page. (If your work was supported by a grant, some sponsors require an acknowledgment of the grant using specific text, so be sure to consult your supervisor.) To create the acknowledgments page, use:

```
\begin{acks}{December 2012}
The author thanks ...
\end{acks}
```

The month and year on the first line should identify when you first gave your thesis or dissertation to your committee for review (which is possibly different than your graduation date). The acknowledgments themselves should consist of complete sentences and paragraphs. Do not use any sectioning macros (e.g., `\section`).

If your dissertation includes work previously published or submitted for publication, you need a preface that includes some mandatory text dictated by UTD:

```

\begin{preface}
(Put extra sentences and paragraphs here, if desired.)
\prefacetext
(Put extra sentences and paragraphs here, if desired.)
\end{preface}

```

The `\prefacetext` macro inserts the UTD-mandated portion of the text.

All dissertations and theses must include an abstract:

```

\begin{abstract}
(Put sentences and paragraphs here.)
\end{abstract}

```

After the abstract comes the table of contents. \LaTeX generates tables of contents automatically, but you must run \LaTeX at least *twice* after any document change that affects the table of contents to be sure the table is fully updated.

```

\tableofcontents

```

If your dissertation has any figures it must have a list of figures, and if it has any tables it must have a list of tables. (But do not include an empty list of figures or tables.) These too are generated automatically and require two runs of \LaTeX to be fully updated.

```

\listoffigures
\listoftables

```

After all of the above, you must execute the macro `\mainmatter`. This changes the page numbering and sectioning styles to the format needed for the majority of the dissertation.

```

\mainmatter

```

2.5 Chapters

The majority of your dissertation should consist of chapters, each started with a `\chapter` command. The following subsections provide tips on how to use the `utdthesis` class in a way that satisfies the UTD formatting requirements (UTD, 2013) and best practices recommended by Turabian (2007).

2.5.1 Fonts

UTD mandates a consistent 12pt font size¹ throughout the main text of the dissertation. This class therefore sets 12pt as the document default font size. Do not change the size using L^AT_EX commands like `\Large`; doing so will violate the UTD requirements. Outside the main text (e.g., in tables and figures), other sizes are permitted.

2.5.2 Chapter Titles and Sectioning

Chapters may be subdivided into sections and subsections using the usual commands (e.g., `\section` and `\subsection`). Chapter titles must remain in the default font style produced by the class file; don't load any packages that change the look of chapter headings. The style of section titles is more flexible, but they must remain in the default font size.

If you need to footnote a chapter or section title, you may use L^AT_EX's `\thanks` macro within the title text:

```
\chapter{Introduction\thanks{This is a footnote.}}
```

Paragraph titles. Special paragraphs may be titled using the `\paragraph` macro, as demonstrated here. Again, these must remain in the default font size.

2.5.3 Figures and Tables

Figures and tables (collectively called *floats*) are started as usual with `\begin{figure}` or `\begin{table}`. UTD requires that floats must go just below the paragraph that first mentions them, or atop the next page, or on a page of all floats, wherever they fit first. The correct positioning argument to achieve this is `[htp]` (here, top, or page-of-floats). You should never use the `b` (bottom) or `!` options, since these violate UTD's requirements.

¹UTD also allows 14pt, but L^AT_EX does not natively support 14pt as a document-default font size, so `utdthesis` does not support it either.

Captions of figures and tables should be created using L^AT_EX's standard `\caption` macro placed at the *bottom* of figures (see Figure 2.1) but at the *top* of tables (see Table 2.1). Do not load packages that change the captioning style, or you may violate UTD's requirements.

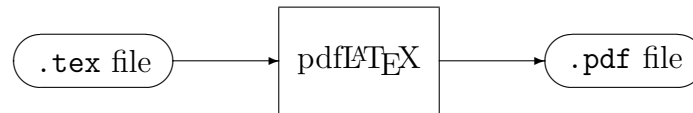


Figure 2.1. A sample figure

If you have a table that spans multiple pages, use a separate `table` environment for each part, use the `[p]` (page) positioning option, and use `\contcaption` (with no argument) instead of a `\caption` command in all but the first one. The results are illustrated by Table 2.2. This is needed to typeset continuation captions differently, as mandated by UTD.

2.5.4 Block Quotations

To create block quotations, use a `quote` or `quotation` environment (they are synonymous):

```

\begin{quote}
  (Write the quotation text here.)
\end{quote}
  
```

The quotation will be single-spaced and indented, as shown below.

The programmer, like the poet, works only slightly removed from pure thought-stuff. He builds his castles in the air, from air, creating by exertion of the imagination. Few media of creation are so flexible, so easy to polish and rework, so readily capable of realizing grand conceptual structures. . . .

Yet the program construct, unlike the poet's words, is real in the sense that it moves and works, producing visible outputs separate from the construct itself. . . . The magic of myth and legend has come true in our time. One types the correct incantation on a keyboard, and a display screen comes to life, showing things that never were nor could be. (Brooks, Jr., 1995)

Table 2.1. A sample landscape-oriented table

Macro	Required	Purpose
<code>\frontmatter</code>	✓	begins pagination style for preliminary pages
<code>\signaturepage</code>	✓	creates the signature page
<code>\copyrightpage{YYYY}</code>		creates a copyright page for year YYYY
<code>\begin{dedication}</code>		begins the dedication page
<code>\end{dedication}</code>		ends the dedication page
<code>\maketitle</code>	✓	creates the title page
<code>\begin{acks}{Month YYYY}</code>	✓	begins the acknowledgments
<code>\end{acks}</code>	✓	ends the acknowledgments
<code>\begin{preface}</code>	M	begins the preface
<code>\prefacetext</code>	M	adds the required UTD text to the preface
<code>\end{preface}</code>	M	ends the preface
<code>\begin{abstract}</code>	✓	begins the abstract
<code>\end{abstract}</code>	✓	ends the abstract
<code>\tableofcontents</code>	✓	creates the table of contents
<code>\listoftables</code>	L	creates the list of tables
<code>\listoffigures</code>	L	creates the list of figures
<code>\mainmatter</code>	✓	begins pagination style for the main document
<i>(main content)</i>	✓	main body of dissertation/thesis
<code>\appendix</code>		start numbering style for appendixes
<i>(appendices)</i>		create appendixes just like chapters
<code>\begin{thesisbib}</code>	✓	start bibliography line spacing
<code>\bibliography{bibfile}</code>	✓	references
<code>\end{thesisbib}</code>	✓	end bibliography line spacing
<code>\begin{vita}</code>	✓	begin your vita
<code>\end{vita}</code>	✓	end your vita

M: These pages are required when the dissertation contains previously published manuscripts or those submitted for publication.

L: Lists of tables and figures are only required when there are tables and figures (respectively) to list.

Table 2.2. Turing Award winners, sorted by year of award

Name	PhD-granting Institution	Year of Award	Field(s)
Alan Perlis	MIT	1966	programming languages
Maurice Wilkes	Cambridge	1967	programming languages and systems
Richard Hamming	UIUC	1968	numerical methods
Marvin Minsky	Princeton	1969	artificial intelligence
James H. Wilkinson	–	1970	numerical analysis
John McCarthy	Princeton	1971	artificial intelligence
Edsger Dijkstra	Amsterdam	1972	programming languages
Charles Bachman	–	1973	databases
Donald Knuth	Caltech	1974	algorithms and programming languages
Allen Newell	CMU	1975	artificial intelligence
Herb Simon	Chicago	1975	artificial intelligence
Michael Rabin	Princeton	1976	theory of computation
Dana Scott	Princeton	1976	theory of computation
John Backus	Poincaré	1977	programming languages
Bob Floyd	–	1978	programming languages and algorithms
Ken Iverson	Harvard	1979	programming languages
Tony Hoare	Oxford	1980	programming languages
Edgar Codd	UMI	1981	databases
Stephen Cook	Harvard	1982	theory of computation
Dennis Ritchie	Harvard	1983	operating systems
Ken Thompson	–	1983	operating systems
Niklaus Wirth	Berkley	1984	programming languages
Dick Karp	Harvard	1985	algorithms and theory of computation
John Hopcroft	Stanford	1986	algorithms
Bob Tarjan	Stanford	1986	algorithms
John Cocke	Duke	1987	programming languages
Ivan Sutherland	MIT	1988	graphics
Velvel Kahan	Toronto	1989	numerical analysis
Corby Corbato	MIT	1990	operating systems
Robin Milner	–	1991	programming languages
Butler Lampson	Berkley	1992	networking, operating systems, programming languages, graphics, and security

Table 2.2 continued

Name	PhD-granting Institution	Year of Award	Field(s)
Juris Hartmanis	Caltech	1993	theory of computation
Dick Stearns	Princeton	1993	theory of computation
Ed Feigenbaum	CMU	1994	artificial intelligence
Raj Reddy	Stanford	1994	artificial intelligence
Manuel Blum	MIT	1995	theory of computation
Amir Pnueli	Weizmann	1996	programming languages and systems
Doug Engelbart	Berkley	1997	human computer interaction
Jim Gray	Berkley	1998	databases
Fred Brooks	Harvard	1999	architectures, operating systems, & software engineering
Andrew Yao	UIUC	2000	theory of computation
Ole-Johan Dahl	–	2001	programming languages
Kristen Nygaard	–	2001	programming languages
Len Adleman	Berkley	2002	cryptography
Ron Rivest	Stanford	2002	cryptography
Adi Shamir	Weizmann	2002	cryptography
Alan Kay	Utah	2003	programming languages
Vint Cerf	UCLA	2004	networking
Bob Kahn	Princeton	2004	networking
Peter Naur	Copenhagen	2005	programming languages
Fran Allen	various	2006	programming languages
Edmund Clarke	Cornell	2007	formal verification
E. Allen Emerson	Harvard	2007	formal verification
Joseph Sifakis	NTUA/Grenoble	2007	formal verification
Barbara Liskov	Stanford	2008	programming languages and systems
Chuck Thacker	–	2009	networking and systems
Leslie Valiant	Warwick	2010	theory of computation
Judea Pearl	NYU-Poly	2011	artificial intelligence

2.5.5 Line Spacing

The main text must be double- or one-and-a-half-spaced throughout; do not change the default line-spacing except as described in §2.4. Footnotes, figures, tables, and block quotes (see §2.5.4) are single-spaced.

If for some reason you need to force single-spacing in other areas of the document, use the `singlespace` environment or `\singlespacing` macro as illustrated below:

```
\begin{singlespace}
(Put text here.)
\end{singlespace}

{\singlespace
(Put text here.)
\par}
```

2.6 Appendixes

After the your final chapter (i.e., the conclusion chapter), you may add one or more appendixes. To do so, first execute the `\appendix` command, which changes the chapter labeling style to one suitable for appendixes.

```
\appendix
```

Then create appendixes with `\chapter` commands, just as you would chapters.

If you have only one appendix, you must use `\chapter*` to create an unlabeled appendix, and you must refer to it in the text as “the appendix.” The appendix of this document demonstrates the formatting of this sort of appendix.

If you have multiple appendixes, use `\chapter` (without the star) to give them alphabetical labels, and refer to them in the text using L^AT_EX code like “`Appendix~\ref{...}`”, which generates “Appendix A”, etc.

2.7 Citations and the References Section

All authors are strongly urged to use a L^AT_EX citation management system (e.g., BibT_EX) to typeset citations semi-automatically. Typically this means you will use the `\cite` macro within your chapters to create citations automatically, rather than typing out the citation texts manually.

The acceptable citation formats vary from department to department, so you should consult your supervisor and Turabian (2007) to determine which is appropriate for your dissertation. In general, we recommend using the `natbib` package with the `chicago` bibliography style. To do so, put the following lines near the top of your `.tex` file:

```
\usepackage[authoryear]{natbib}
\bibliographystyle{chicago}
\let\cite=\citep
```

If you want numbered citations instead of author-year citations, replace `authoryear` with `numbers` in the above.

The references section comes after all chapters and appendixes. It must be contained within a `thesisbib` environment:

```
\begin{thesisbib}
(Bibliography commands go here.)
\end{thesisbib}
```

Within the `thesisbib` environment should go the various commands required by your citation management system, assuming you are using one. The section *must* be entitled “REFERENCES” (not “BIBLIOGRAPHY”), each entry must be single-spaced, and there should be a single blank line between each pair of entries. Be sure you configure your chosen bibliography style file to do this. If you are using `natbib` as suggested above, the correct commands are:

```
\begin{thesisbib}
\setlength{\bibsep}{12pt plus 1pt minus 1pt}
\bibliography{name of your bib file}
\end{thesisbib}
```

2.8 Vita

The final page(s) in your dissertation should be your personal vita:

```
\begin{vita}
  (Write sentences and paragraphs here.)
\end{vita}
```

Note that the vita pages are not numbered, but a (numberless) entry for the vita does appear in the table of contents. This behavior is intentional, and mandated by UTD.

2.9 Proofing

Before visiting the graduate office to have your dissertation checked, be sure to consult the `.log` file generated by L^AT_EX for warnings. The class file is programmed to elicit warnings—each prefixed by the word `utdthesis`—for many common errors, such as inappropriate changes made by other packages to the dissertation margin settings, and misordered mandatory pages.

CHAPTER 3

CONCLUSION

Although the scientific and/or creative contributions of a dissertation are its most important qualities, the impact of those contributions remains contingent upon a clear, lucid presentation that invites wide readership. High-quality typography and consistent typographic style is particularly important when the dissertation content is highly technical.

This UTD thesis class file aids the dissertation author (and future readers) by automating much of the required formatting dictated by the UTD graduate office. It does so in a way that avoids conflicts with existing L^AT_EX style packages, maximizing the set of tools that remain at the author's disposal.

APPENDIX

SAMPLE SOLO APPENDIX

This appendix illustrates the typesetting of a solo appendix, as specified in §2.6. Solo appendixes are not labeled (although any constituent subsections, tables, or figures are labeled as if the appendix is labeled “A”).

REFERENCES

- Brooks, Jr., F. P. (1995). *The Mythical Man-Month: Essays on Software Engineering, Anniversary Edition* (2nd edition). pp. 7. Addison-Wesley.
- Oetiker, T., H. Partl, I. Hyna, and E. Schlegl (2011, April). The not so short guide to L^AT_EX 2_ε. <http://www.ctan.org/tex-archive/info/lshort/english/lshort-letter.pdf>.
- Turabian, K. L. (2007). *A Manual for Writers of Research Papers, Theses, and Dissertations* (7th edition). Chicago and London: The University of Chicago Press.
- UTD (2013, February). *Guide for the Preparation of Master's Theses and Doctoral Dissertations at the University of Texas at Dallas*. Office of the Dean of Graduate Studies, The University of Texas at Dallas.

VITA

Kevin W. Hamlen began learning the basics of \LaTeX in the Fall of 2000 in order to publish computer science journal articles as part of his Ph.D. candidacy at Cornell University. By the completion of his degree in 2006, he had written thousands of lines of \TeX code.

After completing his Ph.D., Dr. Hamlen joined the faculty of the Computer Science Department at The University of Texas at Dallas, and graduated his first two Ph.D. students (Micah Jones and Sunitha Ramanujam) in 2011. By the graduation of his third student (Richard Wartell) in 2012, he had concluded that a properly crafted \LaTeX class file for UTD theses was badly needed to streamline future dissertation preparations. He therefore created this one in December 2012.