

The **uiucthesis** class *

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(Adapted from version by David Hull)

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Abstract

Load the **uiucthesis** class for use with L^AT_EX2e to produce a document that conforms to the format described in *Handbook for Graduate Students Preparing to Deposit*[1].

1 The User Interface

This section describes how to use the **uiucthesis** class to produce a thesis satisfying the format requirements of the Grad College at UIUC. I assume that you are familiar with L^AT_EX, and highly recommend that anyone attempting to use L^AT_EX to produce a thesis have access to a copy of the L^AT_EX book[2].

1.1 Using **uiucthesis**

To write a thesis, you load the UIUC thesis definitions by loading the **uiucthesis** class at the beginning of your L^AT_EX document with the `\documentclass` command. For example,

```
\documentclass[draftthesis,fullpage]{uiucthesis}
```

[draftthesis]

[fancy]

[fullpage]

The **uiucthesis** class provides a number of options. The **[draftthesis]** option causes each page to have a header proclaiming the document to be a draft copy, along with the current time and date. It also omits the copyright page and prints out any marginal notes added with the `\note` macro. The **[fancy]** style option produces slightly fancier chapter headings. The **[fullpage]** style option makes the margins as small as the format requirements allow and uses double-spacing for the text. Because wide text columns are generally considered harder on the reader this is not the default, but is provided as an option because people seem to want it. The **[fancy]** and **[fullpage]** options are incompatible—choose one or the other.

[proquest]

The **[proquest]** option is meant to be used when you are ready to deposit

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your thesis. For doctorates, the Grad College requires the submission of a specially formatted abstract for the ProQuest publication service. To produce this abstract, include the [`proquest`] option and reprocess your file. Everything in your L^AT_EX document will be ignored except the contents of the `abstract` environment, which are printed out in the format required. Once the option is removed from the `\documentclass` command, you can reprocess your thesis as normal (the auxiliary files should be intact). To use this option, the name of your thesis advisor needs to be specified with the `\advisor` command (see below).

[`edeposit`] Use the [`edeposit`] option if you are depositing your thesis electronically. The title page is different and the page numbering is slightly different since the committee approval form is not included with your thesis. If this option is used, you must specify your committee members with the `\committee` command (see below).

[`offcenter`] The [`offcenter`] option adds 1/2 inch to the left margin of all pages. This can be done to allow some extra space there for binding purposes, or if you use the [`fancy`] option, to allow for more space for the chapter numbers at the left side of the page. In past versions of `uiuthesis`, the [`fancy`] option did this by default. This version uses symmetric margins by default, even with the [`fancy`] option. If you have a lot of chapters (i.e., more than 9), your chapter numbers may spill into the 1 inch margin required by the Grad College without using this option. This option should not be used with the [`fullpage`] option.

[`centerchapter`] Normally, the chapter headings are all left-justified on the opening page of each chapter. These headings can all be centered by using the [`centerchapter`] option for the class. This option is not recommended for use with the [`fancy`] option.

1.2 The Title Page

The `\maketitle` command is redefined so that it creates a title page with the correct format for a thesis at UIUC.

`\phdthesis`
`\otherdoctorate`
 `\msthesis`
`\othermasters`
 `\department`
 `\college`

Use the `\phdthesis` or `\msthesis` to set the correct thesis type. If your thesis isn't for a "Ph.D." or "M.S.", you can specify your degree with either `\otherdoctorate{<degree name>}{<abbreviation>}` or `\othermasters{<degree name>}{<abbreviation>}`.

For example, specifying `\phdthesis` is equivalent to giving the command `\otherdoctorate{Doctor of Philosophy}{Ph.D.}`. The default thesis type is `\phdthesis`. Set your department with `\department{<department>}`. This defines the field your degree will be in, so leave out "Department of." The default department is "Computer Science". Define your college with `\college{<college>}`. The default is college is "Graduate College"; you shouldn't need to change it.

`\schools` Use `\schools{<school list>}` to list the previous degrees you have received and the schools that you received them from. Separate multiple degrees with `\backslash`.

`\degreeyear` Use `\degreeyear{<year>}` to define the year in which you will receive your degree. The default is the current year.

`\advisor`
`\adviser` Use `\advisor{<advisor name>}` or `\adviser{<advisor name>}` to specify the

name of your advisor. This is needed to produce the ProQuest abstract (see the [proquest] option above). You only need to submit a ProQuest abstract if you are a doctoral candidate.

\committee
Use \committee{\{committee members\}} to specify the members of your committee and their titles as you want them to appear on the title page. Separate members with \\. This is only needed for electronically deposited theses.

\volume
The \volume macro provides nominal support for very long theses that must be broken up into multiple volumes. Use \volume{\{number\}} to specify the volume number (a single arabic numeral). All this macro does is place the word VOLUME with the number you specify on the title page. You have to take care of what appears in each volume. The easiest way to do this is to create two separate source files, one for each volume.

Here's how to produce an example similar to that in [1].

```
\begin{document}

    \title{Coffee Consumption of Graduate Students \\
           Trying to Finish Dissertations}
    \author{Juan Valdez}
    \department{Food Science}
    \schools{B.A., University of Columbia, 1981\\
             A.M., University of Illinois at Urbana-Champaign, 1986}
    \phdthesis
    \advisor{Java Jack}
    \degreeyear{1994}
    \maketitle
```

1.3 Front Matter

\frontmatter
Typically, a thesis might have an Abstract, a Dedication, some Acknowledgments, and a Preface before the Table of Contents. Use the \frontmatter command to start this preliminary section of the thesis. The \frontmatter command sets the page number of the next page to roman numeral iii (or ii if the [edeposit] option is used). (The title page is page i, and the certificate of committee approval, the “red-bordered form,” is page ii.)

\abstract
The abstract should appear in the abstract environment. Normally, this just produces another chapter with \chapter*{\abstractname}, where \abstractname is “Abstract” (see User Customization below), but if the [proquest] option is specified, then the contents of this environment are used for the ProQuest abstract.

\dedication
A dedication page can be printed with the dedication environment. This produces a separate page with the dedication centered horizontally and vertically, with the text in italics.

After this front matter comes the Table of Contents, List of Tables, List of Figures, etc. Use the standard L^AT_EX commands \tableofcontents, \listoftables, \listoffigures, etc., to generate them. In the uiuthesis format these lists are all single spaced.

`symbolist`
`symbolist*`

Optionally, these tables can be followed by a List of Abbreviations and/or List of Symbols. Introduce these with the `\chapter` command. To aid in making these lists, the `symbolist` and `symbolist*` environments are defined in `uiuthesis`. These environments produce a two-column list as illustrated below. By default the left column is 1 inch wide but can be specified with an optional argument. In the starred environment, the left column is left-justified, otherwise it is centered. See the example below.

Here's an example of what the front matter of a typical thesis looks like. First comes the Abstract and the Dedication, both of which are optional.

```
\frontmatter

% Create an abstract that can also be used for the ProQuest abstract.
% Note that ProQuest truncates their abstracts at 350 words.
\begin{abstract}
This is a comprehensive study of caffeine consumption by graduate
students at the University of Illinois who are in the very final
stages of completing their doctoral degrees. A study group of six
hundred doctoral students\ldots.
\end{abstract}

% Create a dedication in italics with no heading, centered vertically
% on the page.
\begin{dedication}
To Father and Mother.
\end{dedication}

% Create an Acknowledgements page, many departments require you to
% include funding support in this.
\chapter*{Acknowledgments}

This project would not have been possible without the support of
many people. Many thanks to my adviser, Lawrence T. Strongarm, who
read my numerous revisions and helped make some sense of the
confusion. Also thanks to my committee members, Reginald Bottoms,
Karin Vegas, and Cindy Willy, who offered guidance and support.
Thanks to the University of Illinois Graduate College for awarding
me a Dissertation Completion Fellowship, providing me with the
financial means to complete this project. And finally, thanks to
my husband, parents, and numerous friends who endured this long
process with me, always offering support and love.

% The thesis format requires the Table of Contents to come
% before any other major sections, all of these sections after
% the Table of Contents must be listed therein (i.e., use \chapter,
% not \chapter*). Common sections to have between the Table of
% Contents and the main text are:
%
% List of Tables
% List of Figures
```

```
% List Symbols and/or Abbreviations
% etc.

\tableofcontents
\listoftables
\listoffigures
\iffalse
<example>
\fi
```

If you want a List of Symbols or Abbreviations, you can do so as follows:

```
% Create a List of Abbreviations. The left column
% is 1 inch wide and left-justified
\chapter{List of Abbreviations}

\begin{symbolist}
\item[CA] Caffeine Addict.
\item[CD] Coffee Drinker.
\end{symbolist}

% Create a List of Symbols. The left column
% is 0.7 inch wide and centered
\chapter{List of Symbols}

\begin{symbolist}[0.7in]
\item[$\tau$] Time taken to drink one cup of coffee.
\item[$\mu g$] Micrograms (of caffeine, generally).
\end{symbolist}
```

1.4 Main Matter

\mainmatter Begin the main body of your thesis with the `\mainmatter` command. It resets the page number to arabic numeral 1. You can now use any of the commands defined by the the book document class to write your thesis.

In the following example, each of the chapters has been broken out into separate files that are inserted into this main file with the `\include` command. This allows the thesis to be proofed quickly while it is being revised with the `\includeonly` command. To provide an example of what the chapter headings look like, one chapter has been explicitly coded. (Try recompiling the example file with the `[fancy]` option instead of `[fullpage]` to see the effect.)

```
\mainmatter

\include{1-introduction}
\include{2-related}
\include{3-model}
\include{4-predictions}
```

```
\chapter{Conclusions}

We conclude that graduate students like coffee.
\iffalse
<example>
\fi
```

1.5 Reference Matter

- `\appendix` To switch from the body of your thesis to the reference material at the end, you should use the standard L^AT_EX `\appendix` command. In `uiuthesis`, there is also a starred version of this command that eliminates the lettering of the appendices (use if you have a single appendix). Note that if you use `\appendix*` along with the `[fancy]` option, you may want to put “Appendix:” at the beginning of the chapter title.

```
\appendix*
\include{Appendix.tex}
```

1.6 Back Matter

- `\backmatter` The last few chapters in your thesis should not have chapter numbers, but should be listed in the Table of Contents. These chapters include the Bibliography, the Index, and the Vita. L^AT_EX’s `\backmatter` command accomplishes this.

- `\bibliography` Use the standard L^AT_EX bibliography commands to create your bibliography. Most people will use BibT_EX to do this. (See [2]). For those in the sciences, you may want to check out the `cite` package (it’s pretty standard), which will produce numerical citations that are sorted and compressed. You can also use the `natbib` package. Both of these packages can do either bracketed citations or superscript citations.

- `\vita` The `\vita` command begins a new chapter for your vita. In fact, it does exactly the same thing as `\chapter{\vitaname}`, where `\vitaname` is “Vita.”

```
\backmatter
\bibliography{thesisbib}
\chapter{Vita}
Juan Valdez was born\ldots.
\end{document}
```

2 User Customization

- `\draftheader` If you don’t like the header that the the `[draftthesis]` option creates, you can

```

\thesisspacing
\nocopyrightpage
\toclabels
\chaptertitlefont
\sectiontitlefont
\subsectiontitlefont
\subsubsectiontitlefont
\chaptnumberfont
\chaptertitleheight
\bibname
\vitaname
\abstractname
other "name"s
\note

```

redefine the `\draftheader` command so that it produces whatever text you want.

The `uiuchesis` class loads `setspace` for the line spacing commands. See the documentation in that package for more information on the commands it provides. By default, `uiuchesis` uses one and a half line spacing, or double spacing if the `[fullpage]` option is specified. If you're unhappy with that, you can override it by redefining the `\thesisspacing` command.

Unless the `[draftthesis]` option is used, a page with the copyright notice is printed before the title page. If you don't want this page to appear, even in the final version, put the `\nocopyrightpage` macro somewhere in the preamble.

Some departments require the Table of Contents, List of Tables and List of Figures to have a “Page” heading over the page numbers on the first page. This can be accomplished by putting the `\toclabels` command somewhere before the `\tableofcontents` command. (NOTE: if you put the `\tableofcontents` command in a separate file that you `\include` in the main file, the `\toclabels` command must also be in that file.)

These macros contain the font declarations for the corresponding sectioning levels and can be redefined to suit your aesthetic desires. Use `\renewcommand` to do this in the preamble.

The `\chaptnumberfont` macro is really most applicable when the `[fancy]` option is used. It specifies the font declaration used for the chapter number set in the left margin next to the title. Otherwise it specifies the font used to print the words “Chapter #” at the top of each chapter’s opening page. Use `\renewcommand` to redefine this macro in the preamble.

`\chaptertitleheight` is the amount of space allotted for the chapter title at the top of the page. You can redefine it using `\setlength` in the preamble.

`\bibname` is a standard L^AT_EX macro that contains the title of the reference section at the end of your thesis; “References” by default. Use `\renewcommand` to redefine it in the preamble.

Like `\bibname` but it contains the name used for your vita at the very end. The Grad College allows “Vita”, “Author’s Biography”, or “Curriculum Vitae”, each of which is slightly different in format. See [1].

Like above, but for the abstract. By default, “Abstract”.

Similarly, the titles for the Table of Contents, List of Figures, and List of Tables are stored in the macros `\contentsname`, `\listfigurename`, and `\listtablename`, respectively. Their default values are the names in the previous sentence. There are also the macros `\chaptername`, `\appendixname`, `\indexname`, `\partname`, `\tablename`, and `\figurename` that contain the appellations for chapter and appendix headings (not applicable with the `[fancy]` option), the index, parts, tables, and figures. Their default values are Chapter, Appendix, Index, Part, Table, and Figure, respectively. All of these macros can be redefined in the preamble with `\renewcommand`. These macros are all part of the standard L^AT_EX formalism, they are just included here for the reader’s convenience. For example, some departments require chapter headings to be in all caps, which can be done by changing the `\chaptername` macro to be CHAPTER.

This command inserts a marginal note just like `\marginpar` with two distinctions: First, the note is single-spaced in a smaller type for compactness. Second,

it is only printed when the `[draftthesis]` option is used. Since marginal notes are not allowed in the final draft, the `\note` command is recommended over the `\marginpar` command.

3 Backwards Compatibility

Compatibility with previous versions of `uiucthesis` are supported. Previously it was implemented as a package rather than a class, in which case you opened the document with:

```
\documentclass[oneside,...]{book}
\usepackage[...]{uiucthesis}
```

To provide backwards-compatibility, a style file is provided that has the same functionality of the class file described herein. Similarly, (really) old versions of `uiucthesis` used the `preliminary` and `thesis` environments, which are now deprecated but backwards-compatibility support is still provided.

4 Other Issues

4.1 Paper Size and PDF Files

The default paper size for most L^AT_EX distributions is A4, which is slightly different the 8.5 x 11 size for letter paper in the U.S. The Graduate College requires theses to be letter paper size. In addition, many departments want soft copies of the thesis in PDF format. Unfortunately, the program used to convert the dvi file to PDF format (`dvipdfm` on my computer, which is a Windows machine with Mik^TE_Xinstalled on it) often produces PDF files in A4 format, even if `letterpaper` is specifically specified in the your T_EXsource file. If you're having this problem, either run the PDF conversion utility from the command line with the right flag — for example, `dvipdfm -p letter` on my computer — or change the default paper size in the config file for your PDF conversion utility, which will then fix this problem permanently. On my computer, this can be done by going to the `dvipdfm\config` subdirectory off of the main T_EXinstallation directory (usually C:\texmf). In this directory is a file called `config` that has a line for the default paper size.

4.2 Reference Lists at the Chapter Level

The `cite` package includes a style file `chapterbib.sty` that can be used to do a list of references for each chapter instead of just one big list at the end of the thesis. I've not used this style before so you're on your own if you want to do this, but I think it is rather straightforward....

5 Implementation

This section shows the implementation of the `uiucthesis` class. Unless you are interested in the details of how `uiucthesis` works, you probably don't need to read it.

5.1 Compatibility

Provide compatibility with older versions of L^AT_EX.

```
\@ifundefined
 1 \expandafter\ifx\csname @ifundefined\endcsname\relax
 2   \def\@ifundefined#1{%
 3     \expandafter\ifx\csname#1\endcsname\relax
 4       \expandafter\@firstoftwo
 5     \else
 6       \expandafter\@secondoftwo
 7     \fi}
 8 \fi

\MakeUppercase
 9 \@ifundefined{MakeUppercase}{\let\MakeUppercase=\uppercase}{}  

```

5.2 Option Processing

```
10 \newif\if@thesisdraft \@thesisdraftfalse
11 \newif\if@thesisfancy \@thesisfancyfalse
12 \newif\if@fullpage \@fullpagefalse
13 \newif\if@largecaps \@largecapsfalse
14 \newif\if@proquest \@proquestfalse
15 \newif\if@edeposit \@edepositfalse
16 \newif\if@thesisoffcenter \@thesisoffcenterfalse
17 \newif\if@centerchapter \@centerchapterfalse
18 \DeclareOption{draftthesis}{\@thesisdrafttrue}
19 \DeclareOption{fancy}{\@thesisfancytrue}
20 \DeclareOption{fullpage}{\@fullpagetrue}
21 \DeclareOption{proquest}{\@proquesttrue}
22 \DeclareOption{toclabels}{\AtBeginDocument{\toclabels}}
23 \DeclareOption{edeposit}{\@edeposittrue}
24 \DeclareOption{offcenter}{\@thesisoffcentertrue}
25 \DeclareOption{centerchapter}{\@centerchaptertrue}  

```

The `[largecaps]` option causes the title and author's name to be use a "large caps" font on the title page. Otherwise, `uiucthesis` just converts them to uppercase and uses the normal fonts. The difference is that the spacing between the characters in the large caps font is tuned for setting type in all caps.

The large caps font is *not a standard font*, and so it will not exist unless you have installed it.

```
26 \DeclareOption{largecaps}{\@largecapstrue}
```

```

Load the book class with the [oneside] and [letterpaper] options
27 %<class>\DeclareOption*{\PassOptionsToClass{\CurrentOption}{book}}
28 <class>\PassOptionsToClass{letterpaper,oneside}{book}
29 \ProcessOptions
30 <class>\LoadClass{book}

```

If the [proquest] option is used, turn off output to auxiliary files so that the thesis doesn't have to be recompiled again to get all the references correct. Also double-space the ProQuest abstract and use the full page.

```

31 \if@proquest
32     \nofiles      % don't overwrite the .aux files
33     \def\makeindex{}
34     \thesiscfancyfalse
35     \fullpagetrue
36 \fi

```

If the [draftthesis] option was specified, define the \drafthead macro.

```

37 \if@thesisdraft
38     \newcount\timehh\newcount\timemm
39     \timehh=\time \divide\timehh by 60
40     \timemm=\time \count255=\timehh \multiply\count255 by -60
41     \advance\timemm by \count255
42     \def\drafthead{\slshape Draft of \today\ at
43     \ifnum\timehh<10 0\fi\number\timehh\,:\,\ifnum\timemm<10 0\fi\number\timemm}%
44 \fi

```

Define the \toclabels command which prints the headings in the Table of Contents, List of Figures and List of Tables.

```

45 \newcommand{\toclabels}{%
46     \addtocontents{toc}{\vspace*{-\baselineskip}\hfill Page\endgraf}%
47     \addtocontents{lof}{\vspace*{-\baselineskip}\~Figure\hfill Page\endgraf}%
48     \addtocontents{lot}{\vspace*{-\baselineskip}\~Table\hfill Page\endgraf}%

```

5.3 Title Page

\title	Override the standard definitions of \title and \author to also define uppercased versions.
	49 \def\mkuptitle#1{\gdef\@Utitle{#1}} 50 \def\title#1{\gdef\@title{#1}\MakeUppercase{\protect\mkuptitle{#1}}} 51 \def\mkupauthor#1{\gdef\@Uauthor{#1}} 52 \def\author#1{\gdef\@author{#1}\MakeUppercase{\protect\mkupauthor{#1}}}
\phdthesis	Macros to set title page elements.
\msthesis	53 \def\phdthesis{\def\@degree{Doctor of Philosophy}}
\otherdoctorate	54 \def\degree{Ph.D.}
\othermasters	55 \def\@thesisname{DISSERTATION}
\department	56 }
\college	57 \def\msthesis{\def\@degree{Master of Science}}
\schools	58 \def\degree{M.S.}
\degreeyear	59 \def\@thesisname{THESIS}
\committee	60 }
\volume	

```

61 \newcommand{\otherdoctorate}[2]{\def\@degree{#1}
62     \def\degree{#2}
63     \def\@thesisname{DISSERTATION}
64 }
65 \newcommand{\othermasters}[2]{\def\@degree{#1}
66     \def\degree{#2}
67     \def\@thesisname{THESIS}
68 }
69 \def\department#1{\def\@dept{#1}}
70 \def\college#1{\def\@college{#1}}
71 \def\schools#1{\def\@schools{#1}}
72 \def\degreeyear#1{\def\@degreeyear{#1}}
73 \newcommand{\committee}[1]{\gdef\@committee{#1}}
74 \newcommand*{\volume}[1]{\gdef\thesis@volume{VOLUME~#1}}
75 \newcommand*{\thesis@volume}{}
76 \if@edeposit
77     \gdef\@committee{%
78         \ClassError{uiucthesis}{A committee must be specified for e-deposit dissertations.}%
79         \PackageError{uiucthesis}{A committee must be specified for e-deposit dissertations}%
80         {Use \protect\committee\space with members separated by \protect\\'s.}%
81 \fi

```

\copyrightnotice Define the copyright notice as a macro so that the user can change it if desired.

```

82 \def\copyrightnotice{\copyright~\@degreeyear~by \@author. All rights reserved.}

```

\nocopyrightpage The printing of the copyright page can also be turned off with the `\nocopyrightpage` command (must come before `\maketitle`):

```

83 \newif\if@thesiscrpage \@thesiscrpagetrue
84 \let\nocopyrightpage\@thesiscrpagefalse
85 \if@thesisdraft\nocopyrightpage\fi

```

Set the default title page elements.

```

86 \phdthesis
87 \department{Computer Science}
88 \college{Graduate College}
89 \def\@schools{}
90 \def\@degreeyear{\number\year}

```

\maketitle Redefine book's `\maketitle` command to produce the titlepage in the correct format.

```

91 \renewcommand\maketitle{

```

Print the copyright page if we're supposed to.

```

92     \if@thesiscrpage
93         \newpage
94         \thispagestyle{empty}
95         \null\vfill
96         \centerline{\copyrightnotice}%
97         \vskip 3ex % skip to visually center copyright notice

```

```

98      \vfill
99      \fi
```

Now start a new page for the title page. It is single-spaced.

```

100     \newpage
101     \thispagestyle{empty}%
102     \enlargepage{1in}%
103     \begin{group}
104     \def\baselinestretch{1}
```

Check what size font we are using for the text and select a smaller size appropriately.

```

105     \ifnum \@ptsize=2
106         \normalsize
107         \newcommand{\thesis@small}{\small}
108     \else
109         \large
110         \newcommand{\thesis@small}{\normalsize}
111     \fi
```

We have to be careful to get the vertical position right. The easiest way to do this seems to be to just set `\topmargin`, `\headheight`, and `\headsep` for this page.

```

112     \headheight=0pt \headsep=0pt
113     \topmargin=0in
```

Adjust the horizontal spacing so that the title page is centered on the page even if the rest of the document isn't. I'm not sure when `\textwidth` changes take place, so instead we calculate the correct `\oddsidemargin` to center the text column.

```

114     \tempdima=\paperwidth
115     \advance\tempdima by -\textwidth
116     \divide\tempdima by 2
117     \advance\tempdima by -1in
118     \oddsidemargin=\tempdima
119     \let\evensidemargin=\oddsidemargin
```

Create the title page. Different spacing is used depending on whether the `[edeposit]` option is specified. Include the committee and the paragraph at the bottom of the page for e-deposit theses, as required by the Grad College.

```

120     \newdimen\thesis@dim
121     \if@edeposit
122         \thesis@dim=1.25in
123     \else
124         \thesis@dim=1.75in
125     \fi
126     \if@largecaps
127         \def\lc@selectfont{\fontshape{lc}\selectfont}%
128     \else
129         \def\lc@selectfont{}%
130     \fi
131     \begin{center}
132     \if@edeposit\else
```

```

133     \vbox to 1.25in{%
134     \fi
135     \vbox to \thesis@dim{%
136         {\lc@selectfont \Utitle}
137         \if@thesisdraft
138             \\\[12pt]
139             \drafthead
140             \fi
141             \vfil}%
142     \vbox to 2in{%
143         {\lc@selectfont BY}\\\[12pt]
144         {\lc@selectfont \Uauthor}\\\[12pt]
145         \begin{tabular}{c}\@schools\end{tabular}\vfil}%
146     \vbox to 0.5in{\thesis@volume\vfil}
147     \vbox to 2.5in{%
148         {\lc@selectfont \thesisname}\\\[12pt]
149         Submitted in partial fulfillment of the requirements\\\
150         for the degree of \@degree\ in \@dept\\\
151         in the \@college\ of the\\\
152         University of Illinois at Urbana-Champaign, \@degreeyear\vfil}
153 \if@edeposit
154     \vbox to 2.1in{
155         COMMITTEE ON FINAL EXAMINATION*\\\[12pt]
156         \begin{tabular}{c}\@committee\end{tabular}\vfil}
157         \hspace*{-\oddsidemargin}\parbox[t]{6.5in}{\thesis@small%
158             * The Certificate of Committee Approval is not part of dissertations
159             deposited electronically through the Graduate College of the University
160             of Illinois at Urbana-Champaign. A copy of the original Certificate of
161             Committee Approval is permanently archived with the student's record.}%
162 \else
163     \vskip -2ex
164     Urbana, Illinois
165 \fi
166 \end{center}
167 \newpage
168 \endgroup
169 }

```

5.4 Front Matter

`\frontmatter` Redefine `\frontmatter` so that it sets the page number to 2 or 3, depending on whether or not the `[edeposit]` option is given.

```

170 \let\thesis@frontmatter=\frontmatter
171 \def\frontmatter{%
172     \thesis@frontmatter
173     \if@edeposit
174         \setcounter{page}{2}
175     \else
176         \setcounter{page}{3}

```

```
177     \fi}
```

5.5 Table of Contents

- \contentsname Use “Table of Contents” instead of “Contents”.
- ```
178 \renewcommand{\contentsname}{Table of Contents}
```
- \l@chapter This code is a modified version of the code in the 1996/05/26 release of classes.dtx that produces leader dots between the chapter name and the page number.  
This macro formats the entries in the table of contents for chapters. It is very similar to \l@part  
First we make sure that if a pagebreak should occur, it occurs *before* this entry. Also a little whitespace is added and a group begun to keep changes local.
- ```
179 \renewcommand*{\l@chapter}[2]{%
180   \ifnum \c@tocdepth > \m@ne
181     \addpenalty{-\@highpenalty}%
182     \vskip 1.0em \oplus 0.2em \ominus 0.2em
```
- The macro \numberline requires that the width of the box that holds the part number is stored in L^AT_EX’s scratch register \tempdima. Therefore we put it there. We begin a group, and change some of the paragraph parameters. These are different from the defaults for the standard report or book class.
- ```
183 \setlength{\tempdima}{1.5em}
184 \begingroup
185 \leftskip \z@ \rightskip \tempdima \parfillskip -\rightskip
186 \parindent \z@
```
- Then we leave vertical mode and switch to a bold font.
- ```
187   \leavevmode \bfseries
```
- Because we do not use \numberline here, we have do some fine tuning ‘by hand’, before we can set the entry. We discourage but not disallow a pagebreak immediately after a chapter entry. We use leaders between the chapter title and the page number, unlike the standard report or book class.
- ```
188 \advance\leftskip\tempdima
189 \hskip -\leftskip
190 #1\nobreak
191 \leaders\hbox{$\m@th\mkern\dotsep\mu\hbox{.}\mkern\dotsep\mu$}
192 \hfil \nobreak\hbox to\pnumwidth{\hss #2}\par
193 \penalty\@highpenalty
194 \endgroup
195 } \fi}
```
- \tableofcontents We want the Table of Contents to be single-spaced, so we save the original definition, and then arrange it so that the new \tableofcontents calls \singespacing before calling the original definition. Then set the flag mentioned above.
- ```
196 \let\thesis@tableofcontents=\tableofcontents
197 \def\tableofcontents{{\singespacing\thesis@tableofcontents}}
```

\listoftables Similarly, redefine `\listoftables` and `\listoffigures` so that they use single spacing.

```
198 \let\thesis@listoftables=\listoftables
199 \def\listoftables{\newpage%
200   \addcontentsline{toc}{chapter}{\listtablename}%
201   {\single spacing\thesis@listoftables}}
202 \let\thesis@listoffigures=\listoffigures
203 \def\listoffigures{\newpage%
204   \addcontentsline{toc}{chapter}{\listfigurename}%
205   {\single spacing\thesis@listoffigures}}
```

5.6 Other Frontmatter

abstract The `abstract` environment is special because its contents are also used for the ProQuest abstract, which we need the advisor's name for:

\adviser Two versions of this macro are provided due to the ambiguity of the spelling of `\advisor` the word “adviser”.

```
206 \newcommand*{\advisor}[1]{\gdef\@advisor{#1}}
207 \newcommand*{\adviser}[1]{\gdef\@advisor{#1}}
```

If the `[proquest]` option was specified, erase the definition for `\maketitle` since we don't want a title page, and print an error if the advisor's name is not specified. Then define the `abstract` environment to create the ProQuest abstract and then end the document.

```
208 \def\abstractname{Abstract}
209 \if@proquest
210   \def\maketitle{}
211   \def\@advisor{%
212     <class> \ClassError{uiucthesis}{An advisor must be specified for the ProQuest abstract}%
213     <package> \PackageError{uiucthesis}{An advisor must be specified for the ProQuest abstract}%
214     {Use \protect\advisor\space to specify a name}%
215   \newenvironment{abstract}{%
216     \newpage
217     \pagestyle{empty}
218     \setcounter{page}{1}
219     \begin{singlespace}\begin{center}
220       \@title\\[\baselineskip]
221       \@author, \degree\\
222       Department of \dept\\
223       University of Illinois at Urbana-Champaign, \degreeyear\\
224       \@advisor, Adviser\\[\baselineskip]
225     \end{center}\end{singlespace}\par\noindent\ignorespaces
226   }{
227     \newpage
228     \aftergroup\enddocument
229     \aftergroup\endinput
230   }
```

If we are doing normal processing (no [proquest] option), simply define the `abstract` environment to start a regular chapter.

```
231 \else
232 \newenvironment{abstract}{\chapter*{\abstractname}}{}
233 \fi
```

`dedication` The dedication environment just starts a new page and prints the dedication in the center in italics.

```
234 \newenvironment{dedication}{%
235   \newpage
236   \leavevmode\vfill
237   \begin{center}
238     \itshape
239   \{
240   \end{center}
241   \vskip 3ex
242   \vfill
243   \newpage
244 }
```

`symbolist` The `symbolist` environments can be used to create a list of symbols or abbreviations. The starred version left-justifies the left column (good for lists of abbreviations) whereas the unstarred version centers the contents of the left column (good for lists of symbols).

```
245 \newenvironment*{symbolist}[1][1in]{%
246   \begin{list}{}{\singespacing
247   \setlength{\leftmargin}{#1}
248   \setlength{\labelwidth}{#1}
249   \addtolength{\labelwidth}{-\labelsep}
250   \setlength{\topsep}{0in}%
251   \def\makelabel##1{\hfil##1\hfil}%
252   }%
253   \end{list}}
254 \newenvironment*{symbolist*}[1][1in]{%
255   \begin{symbolist}[#1]
256   \def\makelabel##1{\hfil##1\hfil}%
257   \end{symbolist}}
```

5.7 Chapter Headings

Text of chapter title must match exactly with text in Table of Contents. We support both plain chapter headings and “fancy” chapter headings.

`\chapternumberfont` Define the font used for chapter numbers in fancy chapter headings. If you’re using scalable PostScript fonts, you might want to override it, for example:

```
\renewcommand\chapternumberfont{%
  \fontseries{bx}\fontsize{72}{72}\selectfont}
```

```

258 \if@thesisfancy
259   \font\cminch=cminch at 60pt
260   \newcommand\chapternumberfont{\cminch}
261 \else
262   \newcommand\chapternumberfont{\huge\bfseries}
263 \fi

```

\chaptertitlefont Define the font used for chapter titles.

```
264 \newcommand\chaptertitlefont{\Huge\bfseries}
```

\@chapter This macro is called when we have a numbered chapter. When `secnumdepth` is larger than `-1` and, in the book class, `\@mainmatter` is true, we display the chapter number. We also inform the user that a new chapter is about to be typeset by writing a message to the terminal. This definition is the same as that in `book.cls` except that it makes different entries in the table of contents for fancy chapter heads.

```

265 \def\@chapter[#1]#2{%
266   \ifnum \c@secnumdepth >\m@ne
267     \if@mainmatter
268       \refstepcounter{chapter}%
269       \typeout{\@chapapp\space\thechapter.}%
270     \if@thesisfancy
271       \addcontentsline{toc}{chapter}%
272       {\protect\numberline{\thechapter}#1}%
273   \else
274     \addcontentsline{toc}{chapter}%
275     {\@chapapp\ \thechapter\quad #1}%
276   \fi
277 \else
278   \addcontentsline{toc}{chapter}{#1}%
279 \fi
280 \else
281   \addcontentsline{toc}{chapter}{#1}%
282 \fi

```

After having written an entry to the table of contents we store the (alternative) title of this chapter with `\chaptermark` and add some white space to the lists of figures and tables.

```

283 \chaptermark{#1}%
284 \addtocontents{lof}{\protect\addvspace{10\p@}}%
285 \addtocontents{lot}{\protect\addvspace{10\p@}}%

```

Then we call upon `\@makechapterhead` to format the actual chapter title. We have to do this in a special way when we are in `twocolumn` mode in order to have the chapter title use the entire `\textwidth`. In one column mode we call `\@afterheading`, which takes care of suppressing the indentation.

```

286 \if@twocolumn
287   \atopnewpage[\@makechapterhead{#2}]%
288 \else

```

```

289      \@makechapterhead{\#2}%
290      \@afterheading
291  \fi}

```

For fancy chapter headings, compute the correct height to use for the chapter number. I want the chapter number to be centered on the first line of the chapter title. If a is the height of the chapter number and b is the height of the chapter title, then if we set the chapter number in a box of height $b + (a - b)/2 = (a + b)/2$ then it aligns correctly.

We arrange for this value to be computed at the beginning of the document in case the user loads a style file that changed the default fonts.

In addition, we want the chapter titles to have the same vertical placement on the page, regardless whether the chapter is numbered or not. We compute the distance we have to skip for chapters without numbers to accomplish this and store it in `\thesis@chapskip`.

```

292 \newskip\thesis@chapskip
293 \AtBeginDocument{%
294   \newdimen\chaptnumberheight
295   \begingroup
296     \chaptnumberfont
297     \setbox255=\hbox{A}
298     \if@thesisfancy
299       \global\thesis@chapskip=\ht255
300     \else
301       \global\thesis@chapskip=\baselineskip
302     \fi
303     \dimen255=\ht255
304     \chapertitlefont
305     \setbox255=\hbox{A}
306     \advance\dimen255 by \ht255
307     \if@thesisfancy
308       \global\advance\thesis@chapskip by -\ht255
309       \global\divide\thesis@chapskip by 2
310       \global\advance\thesis@chapskip by 10\p@
311     \else
312       \global\advance\thesis@chapskip by 20\p@
313     \fi
314     \divide\dimen255 by 2
315     \global\chaptnumberheight=\dimen255
316   \endgroup}

```

`\chapertitleheight` The amount of space allotted for the chapter titles is stored in `\chapertitleheight`. In this manner, the chapter text always appears at the same vertical place for each chapter, even if the title spills over into multiple lines.

```

317 \newlength{\chapertitleheight}
318 \if@thesisfancy
319   \setlength{\chapertitleheight}{1.5in}
320 \else

```

```
321   \setlength{\chaptertitleheight}{1.85in}
322 \fi
```

\@makechapterhead The macro `\@chapter` uses `\@makechapterhead<text>` to format the heading of the chapter. This is a modified version of the standard `\@makechapterhead`. It sets the chapter heading in single spacing, and it handles the fancy heading style. The whole heading is placed in a `\vbox` so that it is confined to the spacing allotted to it as defined in `\chaptertitleheight`.

```
323 \def\@makechapterhead#1{%
324   \vbox to \chaptertitleheight{
325     \def\baselinestretch{1}\@normalsize
326     \parindent \z@ \raggedright \normalfont
327     \if@centerchapter
328       \centering
329     \fi
330     \ifnum \c@secnumdepth >\m@ne
331       \if@mainmatter
332         \thesis@chapskip=\z@
333         \if@thesisfancy
334           \vspace*{10\p@}%
335           \leavevmode\llap{\vbox to \chapternumberheight{\hbox{%
336             \chapternumberfont\thechapter\,}\vss}}%
337         \else
338           {\chapternumberfont \chapapp\space \thechapter}
339           \par\nobreak
340           \vskip 20\p@
341         \fi
342       \fi
343     \fi
344     \interlinepenalty\@M
345     \vspace*{\thesis@chapskip}%
346     \chaptertitlefont #1
347     \vfil
348   }%
349   \par\nobreak%
350 }
```

\@makeschapterhead The macro `\@makeschapterhead<text>` to format the heading of the chapter. It is similar to `\@makechapterhead` except that it never has to print a chapter number.

```
351 \def\@makeschapterhead#1{%
352   \vbox to \chaptertitleheight{
353     \def\baselinestretch{1}\@normalsize
354     \parindent \z@ \raggedright \normalfont
355     \if@centerchapter
356       \centering
357     \fi
358     \interlinepenalty\@M
359     \vspace*{\thesis@chapskip}
```

```

360      \chapertitlefont #1
361      \vfil
362  }%
363 \par\nobreak%
364 }

```

5.8 Lower Level Headings

- \sectiontitlefont These macros contain the font declarations for the sectioning titles.
- \subsectiontitlefont 365 \newcommand{\sectiontitlefont}{\Large\bfseries}
- \subsubsectiontitlefont 366 \newcommand{\subsectiontitlefont}{\large\bfseries}
- 367 \newcommand{\subsubsectiontitlefont}{\normalsize\bfseries}
- \section We redefine the lower level headings to set their titles ragged right. We don't have to change sectioning commands below \subsubsection because they produce run-in headings.
- ```

368 \renewcommand\section{@startsection {section}{1}{\z@}%
369 {-3.5ex \@plus -1ex \@minus -.2ex}%
370 {2.3ex \@plus .2ex}%
371 {\raggedright\normalfont\sectiontitlefont}}
372 \renewcommand\subsection{@startsection{subsection}{2}{\z@}%
373 {-3.25ex \@plus -1ex \@minus -.2ex}%
374 {1.5ex \@plus .2ex}%
375 {\raggedright\normalfont\subsectiontitlefont}}
376 \renewcommand\subsubsection{@startsection{subsubsection}{3}{\z@}%
377 {-3.25ex \@plus -1ex \@minus -.2ex}%
378 {1.5ex \@plus .2ex}%
379 {\raggedright\normalfont\subsubsectiontitlefont}}

```

## 5.9 Appendices

- \appendix Redefine the \appendix macro so that it can take a star if unlettered appendices are desired.
- ```

380 \let\thesis@appendix\appendix
381 \renewcommand\appendix{\thesis@appendix@ifstar{\gdef\thechapter{}{}}}

```

5.10 Bibliography

- \bibname UIUC Thesis format says that if references are cited as “[1]” then one of the terms “References,” “List of References,” or “Literature Cited” should be used instead of “Bibliography.”
- ```

382 \renewcommand\bibname{References}

```
- \thebibliography The standard definition of \thebibliography environment issues the \chapter\* command, which does not make the necessary entry to the TOC. Here the environment is redefined so that the unstarred version is used instead. In addition, the environment is also single-spaced for aesthetics. These modifications are done at the

beginning of the document since some packages (`natbib` in particular) change the definition of `thebibliography` environment.

```
383 \AtBeginDocument{\let\thesis@thebib\thebibliography
384 \let\thesis@endbib\endthebibliography
385 \def\thebibliography{\begingroup\singlespacing%
386 \chapter{\bibname}%
387 \let\chapter@\gobbletwo%
388 \thesis@thebib}%
389 \def\endthebibliography{\thesis@endbib\endgroup}}
```

## 5.11 Index

`theindex` The index is single spaced and a line is added to the Table of Contents.

```
390 \let\thesis@theindex=\theindex
391 \def\theindex{\addcontentsline{toc}{chapter}{\indexname}%
392 \begingroup\singlespacing\thesis@theindex}
393 \let\thesis@endtheindex=\endtheindex
394 \def\endtheindex{\thesis@endtheindex\endgroup}
```

## 5.12 Page Layout

First we set the vertical layout. Adjust the height of the text column so that it takes up the full height of an 8.5 by 11 inch page.

```
395 \topmargin=0pt
396 \advance \topmargin by -\headheight
397 \advance \topmargin by -\headsep
398 \textheight 8.9in
```

Next, set the horizontal layout.

The standard for technical papers seems to be to use extremely wide columns of text, and then to increase the spacing between lines to compensate for the long lines. Unfortunately, because so many papers are typeset this way, the format has become self-propagating.

The `[fullpage]` option sets one-inch margins.

```
399 \if@fullpage
400 \setlength{\textwidth}{\paperwidth}
401 \addtolength{\textwidth}{-2in}
402 \settowidth{\textwidth}
403 \fi
```

In the old version of `uiuthesis`, the “fancy” thesis style used an asymmetric page layout, shifting the text column slightly over to the right to leave room for the chapter number to the left of the chapter title. This layout is still used if the `[offcenter]` option is given, otherwise symmetric margins are used.

```
404 \setlength{\tempdima}{\paperwidth}
405 \addtolength{\tempdima}{-\textwidth}
406 \setlength{\oddsidemargin}{.5\tempdima}
407 \addtolength{\oddsidemargin}{-1in}
```

```

408 \if@thesisoffcenter
409 \addtolength{\oddsidemargin}{0.5in}
410 \reversemarginpar
411 \fi

```

Set `\marginparwidth`, leaving 24pt for the right margin. Note that you're not allowed to actually use a marginal paragraph this close to the edge in the final version of a thesis, but it is still handy for leaving notes to yourself in the draft (with the `\note` command, see below).

```

412 \setlength{\marginparwidth}{\oddsidemargin}
413 \addtolength{\marginparwidth}{1in}
414 \addtolength{\marginparwidth}{-\marginparsep}
415 \addtolength{\marginparwidth}{-24pt}

```

Use the same margins for even and odd pages. Use the L<sup>A</sup>T<sub>E</sub>Xmacro `\@settopoint` to truncate arithmetic errors.

```

416 \@settopoint\oddsidemargin
417 \@settopoint\marginparwidth
418 \setlength{\evensidemargin}{\oddsidemargin}

```

### 5.13 Making Notes

**\note** You can leave yourself marginal notes using the `\note{<text>}` macro. If the final draft is being printed (i.e., no `[draftthesis]` option) then these notes are not printed.

```

419 \if@thesisdraft
420 \newcommand{\note}[1]{\marginpar{\def\baselinestretch{1}\small\raggedright #1}}
421 \else
422 \newcommand{\note}[1]{}
423 \let\thesis@marginpar\marginpar
424 \def\marginpar{%
425 \ClassWarning{uiuthesis}{Margin paragraphs fall outside the allowed margins\Message}
426 \PackageWarning{uiuthesis}{Margin paragraphs fall outside the allowed margins\Message}
427 for UIUC Theses, use \protect\note\space instead of \protect\marginpar.}%
428 \thesis@marginpar
429 \fi

```

### 5.14 Page Numbering

Page numbers must be in one of three places, and must appear in the same place on *every page*, including chapter openings.

To accommodate the draft heading, we redefine the plain page style.

```

\ps@plain
430 \def\ps@plain{%
431 \let\@mkboth\@gobbletwo
432 \if@thesisdraft
433 \def\@oddhead{\drafthead\hfil}
434 \else

```

```

435 \let\@oddhead\@empty
436 \fi
437 \let\@evenhead\@oddhead
438 \def\@oddfoot{\reset@font\hfil\thepage\hfil}%
439 \let\@evenfoot\@oddfoot
440 }

```

**\ps@headings** The “headings” page style is also supported. The heading at the top will be within the 1 inch margin that you are supposed to allow, however. If the [draftthesis] option is given, there is probably not enough room for both the chapter number and title, so just print the number in that case.

```

441 \if@twoside
442 \def\ps@headings{%
443 \if@thesisdraft
444 \def\@oddhead{\drafthead\hfil\slshape\rightmark}
445 \def\@evenhead{\slshape\leftmark\hfil\drafthead}
446 \else
447 \def\@oddhead{\hfil\slshape\rightmark}
448 \def\@evenhead{\slshape\leftmark\hfil}
449 \fi
450 \def\@oddfoot{\reset@font\hfil\thepage\hfil}%
451 \let\@evenfoot\@oddfoot
452 \let\@mkboth\markboth
453 \if@thesisdraft
454 \def\chaptermark##1{%
455 \markboth {\MakeUppercase{%
456 \ifnum \c@secnumdepth >\m@ne
457 \if@mainmatter
458 \chapapp\ \thechapter%
459 \fi
460 \fi}}{}}}
461 \else
462 \def\chaptermark##1{%
463 \def\@chaphead{\MakeUppercase{%
464 \ifnum \c@secnumdepth >\m@ne
465 \if@mainmatter
466 \if@thesisfancy
467 \thechapter.~~%
468 \else
469 \chapapp\ \thechapter.~~%
470 \fi
471 \fi
472 \fi
473 ##1}}%
474 \markboth{\@chaphead}{\@chaphead}}
475 \fi
476 \def\sectionmark##1{%
477 \markright {\MakeUppercase{%
478 \ifnum \c@secnumdepth >\z@

```

```

479 \thesection. \ %
480 \fi
481 ##1}}}}
482 \else
483 \def\ps@headings{%
484 \if@thesisdraft
485 \def\@oddhead{\drafthead\hfil\slshape\rightmark}
486 \else
487 \def\@oddhead{\hfil\slshape\rightmark\hfil}
488 \fi
489 \let\@evenhead\@oddhead
490 \def\@oddfoot{\reset@font\hfil\thepage\hfil}%
491 \let\@evenfoot\@oddfoot
492 \let\@mkboth\markboth
493 \if@thesisdraft
494 \def\chaptermark##1{%
495 \markright {\MakeUppercase{%
496 \ifnum \c@secnumdepth >\m@ne
497 \if@mainmatter
498 \chapapp\ \thechapter%
499 \fi
500 }})
501 \else
502 \def\chaptermark##1{%
503 \markright {\MakeUppercase{%
504 \ifnum \c@secnumdepth >\m@ne
505 \if@mainmatter
506 \if@thesisfancy
507 \thechapter.~%
508 \else
509 \chapapp\ \thechapter.~%
510 \fi
511 \fi
512 \fi
513 }})
514 \fi
515 }
516 \fi

```

Set the default page style to (our new definition of) plain.

```
517 \pagestyle{plain}
```

**\chapter** Redefine \chapter to not do \thispagestyle{empty} because even chapter openings should have page numbers in UIUC theses.

```

518 \renewcommand\chapter{\if@openright\cleardoublepage\else\clearpage\fi
519 \@mkboth{}{}}
520 \thispagestyle{plain}
521 \global\@topnum\z@
522 \cafterindentfalse
523 \secdef\@chapter\@schapter}

```

## 5.15 Vita

The support for `\vita` is pretty minimal.

- `\vitaname` Define `\vitaname` so the user can change it if he wants.  
524 `\newcommand{\vitaname}{Vita}`
- `\vita` Vita should appear in Table of Contents, but should not be numbered.  
525 `\newcommand{\vita{`  
526  `\chapter{\vitaname} %`  
527 `}`

## 5.16 Body Formatting

- `\thesisspace` The `\thesisspace` command is called to switch to the default line spacing for the thesis. The thesis format requirements require at least line and a half spacing. The `uiuthesis` class by default uses `\onehalfspacing`, or `\doublespacing` if the `[fullpage]` option is in effect.  
528 `\def\thesisspace{\if@fullpage\doublespacing\else\onehalfspacing\fi}`

At this point, we're ready to set up the actual formatting for the front matter of the thesis. We use roman page numbers. Also, arrange so that `\thesisspace` gets called when the document begins. We don't just call it here because that wouldn't give the user a chance to override it.

- 529 `\pagenumbering{roman}`  
530 `\AtBeginDocument{\thesisspace}`

## 5.17 Compatibility

- `preliminary` The old `uiuthesis` style defined a `preliminary` environment for the front matter. This isn't needed with this style, so we redefine it to call `\frontmatter` for compatibility's sake.  
531 `\def\preliminary{\frontmatter}`  
532 `\let\endpreliminary=\relax`
- `thesis` Similarly, the old `uiuthesis` style defined a `thesis` environment that has been superceded by the `\mainmatter` command. We define it here for backward compatibility.  
533 `\def\thesis{\mainmatter}`  
534 `\let\endthesis=\relax`

## References

- [1] *Handbook for Graduate Students Preparing to Deposit*. Graduate College, University of Illinois at Urbana-Champaign, 2004
- [2] Leslie Lamport. *L<sup>A</sup>T<sub>E</sub>X: A Document Preparation System*. Addison-Wesley, 1994.