

# Preparing an Electronic Thesis or Dissertation (ETD) with $\text{\LaTeX}$

Instructions for document preparation and  
helpful hints on  $\text{\LaTeX}$ .

< *ETD* > Electronic Thesis and Dissertation  
Project

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# Definitions

- Electronic Thesis or Dissertation (ETD)
- Paper Thesis or Dissertation
- Markup Language
- WYSIWYG
- PDF — Portable Document Format

# Electronic Thesis or Dissertation (ETD)

- Encouraged by the Graduate School
- Saves you time and money
  - No more 50% cotton bond paper
  - No more midnight trips to the copy-shop
- Placed on the library ETD server
  - not a dusty shelf
  - not off-site storage
  - for the whole world

*Remember the \$20 dollar bill...*

# What is $\text{\LaTeX}$ ?

- Language specification
- Batch software (not interactive) to process the language

$\text{\LaTeX}$  is like a programming language, where “`latex`” is the compiler.

$$\text{L}\text{A}\text{T}_{\text{E}}\text{X} = \text{L}\text{a} + \text{T}_{\text{E}}\text{X}$$

- By Leslie Lamport
- Friendly interface to T<sub>E</sub>X

Lamport, Leslie. *LaTeX: A Document Preparation System*. Addison-Wesley, Menlo Park, CA, Second Edition, 1994.

*(the "Lion" book)*

# L<sup>A</sup>T<sub>E</sub>X is popular with professional publishers

- Robust
  - Survives versioning
  - Promotes consistency
- Supported on multiple architectures
- Free

- L<sup>A</sup>T<sub>E</sub>X at handling two dimensional space — excels very well.

# L<sup>A</sup>T<sub>E</sub>X is Free

- Visit an FTP site like  
`ftp://pip.shsu.edu/tex-archive/systems`
- Download L<sup>A</sup>T<sub>E</sub>X for your machine type  
(~1<sub>meg</sub> zipped)
- Read the documentation
- Install L<sup>A</sup>T<sub>E</sub>X

Alternatively, find out if your department machine has it.

(In the Computer Science Department, it is available on any machine that links to the departmental server {csgrad, ei, vtopus, ...} among others.)

# Rules for Markup

(Markup Rules!)

- Type in *any* text editor
- Intersperse the text and the markup
- ¿Markup? works like punctuation— in “regular” text...
- Whitespace counts as markup

## Markup Example

HTML is the “HyperText Markup Language”

Example:

```
<p>This is some paragraph text  
with an <em>emphasized</em> word.
```

Translation:

This is some paragraph text with an  
*emphasized* word.

## Rules for Markup, *continued*

1. Pick text editor
2. Edit source file, inserting text and markup
3. Save as: “Text File with Line Breaks”
4. Run `latex` on it
5. View with `xdvi` (or another DVI viewer)

Q: How is this similar to HTML?

## EXAMPLE: Hello, world.

- Create a sample document using a text editor
- Type in the following lines.
- Save it (for example) as “sample.tex”

```
\documentclass{report}  
\begin{document}
```

```
Hello, world.
```

```
\end{document}
```

# Running latex to get DVI

Running

```
latex sample.tex
```

gives you a DVI file (sample.dvi).

Installations of  $\text{\LaTeX}$  will include a DVI file viewer that works somewhat like Adobe Acrobat does for PDF files.

# Your ETD will cover more material

- Title page
- Abstract
- Acknowledgements
- Introduction ... Conclusion
- References
- Appendices
- Vita

# L<sup>A</sup>T<sub>E</sub>X for a Thesis or Dissertation

L<sup>A</sup>T<sub>E</sub>X source documents have two parts:

- Preamble
- Body

# L<sup>A</sup>T<sub>E</sub>X document parts:

## Preamble

Put this information in the preamble:

### 1. Document class

- book, article, letter, slides

### 2. Spacing adjustments

- Margins, Lines, Paragraphs

### 3. Package declarations

- Encapsulated Postscript

## L<sup>A</sup>T<sub>E</sub>X document parts: Body

All the text for your document goes here, in between the following markup:

```
\begin{document}
```

```
\end{document}
```

# Preamble 1: Declare Document Class

- Declare the “report” document class on the **first line** of your  $\text{\LaTeX}$  source file. The graduate school requirement is 12 points.

```
\documentclass[12pt]{report}
```

## Preamble 2: Set up Required Margins

By default,  $\text{\LaTeX}$  uses larger margins than the graduate school requires for ETDs.

HINT: Put these lines in your preamble.

```
\addtolength{\textwidth}{1.00in}  
\addtolength{\textheight}{0.5in}  
\addtolength{\evensidemargin}{-0.50in}  
\addtolength{\oddsidemargin}{-0.50in}  
\setlength{\parindent}{0pt}  
\setlength{\parskip}{1em}
```

## Preamble 3: Set up Double-spacing

If your committee requires that drafts of your ETD be double-spaced, uncomment the next line by removing the percent sign (%).

Remember to remove this line when preparing the Graduate School copy.

```
% \renewcommand{\baselinestretch}{2}
```

## Preamble 4: Set up Packages

If you want to include Encapsulated PostScript files (from AutoCAD, Corel Draw, Adobe Illustrator, etc.) as figures, you must declare this.

```
\usepackage{epsf}
```

# The Body

The preamble is complete.

The data for your ETD fits between the following:

```
\begin{document}
```

```
\end{document}
```

# Body 1: The ETD Title Page

Title, Author, Degree, Approvals, Date, City, State, Keywords and Copyright go here.

```
\thispagestyle{empty}  
\pagenumbering{roman}  
\begin{center}
```

```
{\Large Use of Metaphor in Shekespeare's Plays  
and its Potential Application in Twenty-first  
Century Literature}
```

```
\vfill
```

Albert J. Kippleby

```
\vfill
```

Dissertation submitted to the Faculty of the  
Virginia Polytechnic Institute and State University  
in partial fulfillment of the requirements for the degree of

```
\vfill
```

# Body 1a: ETD Title Page, cont.

Doctor of Philosophy \\  
in \\  
Literature and Technology

\vfill

Neill A. Kipp, Chair \\  
Emilio J. Arce \\  
Scott A. Guyer \\  
Laura Weiss

\vfill

July 19, 1996 \\  
Blacksburg, Virginia

\vfill

Keywords: Metaphysics, Information Retrieval, Spacecraft \\  
Copyright 1996, Albert J. Kippleby  
\pagebreak

## Body 2: Abstract Page

Title, Author, (ABSTRACT), text of the abstract, then the grant information go here.

```
\thispagestyle{empty}  
\begin{center}
```

```
{\large Use of Metaphor in Shekespeare's Plays  
and its Potential Application in Twenty-first  
Century Literature}
```

```
\vfill
```

```
Albert J. Kippleby
```

```
\vfill
```

```
(ABSTRACT)
```

```
\vfill
```

```
\end{center}
```

The need for concrete examples increases when technology becomes difficult to explain. In documentation for computer systems especially, we see a wide audience of field experts attempting to comprehend documentation for computer software and hardware of which they should only require a cursory understanding. Additionally, as the pace of the information age quickens we see document authors struggle for `\textit{examplia-concretes}` with wide applicability, and consistently rely on excerpts from Shakespearean literature as a public-domain source for their various explications.

## Body 2: Abstract Page, cont.

We predict the twenty-first century will be no different. Actuarial studies show explosion in the information industry such that four out of five persons will be `\textit{bona fide}` electronic document authors; many of those will have one or more college degrees. We prove through computer simulation `\textsc{Machinum Simitatores}` that authors of twenty-first century literature will be affected by these examples and will include metaphor with Shakespearean source into their writing with increasing frequency.

`\vfill`

That this work received support from the Southeastern Universities Research Association (SURA) ‘‘Monticello Library Project’’ is purely coincidental.

`\pagebreak`

## Body 3: Acknowledgements

Acknowledge everyone you know on this page.

I would like to thank my loving spouse, my parents, my siblings, my beautiful and patient children, ...

... my major professor (who never sleeps), committee, teachers, loyal staff, administrators, ...}

... Mill Mountain, Bollo's, SubStation II, the Cellar, Dominion Brewery, Neill Kipp, ...

\pagebreak

## Body 4: Navigation Information

The graduate school requires a table of contents, a lists of multimedia objects, like figures and tables. Your discipline may require similar lists.

$\text{\LaTeX}$  *automatically generates* TOC, LOF and LOT.

```
\tableofcontents
```

```
\pagebreak
```

```
\listoffigures
```

```
\pagebreak
```

```
\listoftables
```

```
\pagebreak
```

# Body 5: Chapters, Sections, Subsections

Use the following to name and separate your document parts.

```
\chapter{Introduction}
```

```
blah blah blah...
```

```
\section{Statement of the Problem}
```

```
blah blah blah blah...
```

```
\chapter{William Shakespeare and William Clinton}
```

```
blah blah blah blah...
```

```
\section{Analysis of William Clinton's Writings}
```

```
blah blah blah blah...
```

```
\subsection{Folkways}
```

```
blah blah blah blah...
```

## Body 6: Paragraphs

For paragraphs all you do is type in the text of the paragraph, just like this.

- Separate paragraphs with two newlines
- Put in `\emph{emphasized}` words like this
- And `\textbf{bold}` words like this

# Itemized Lists

L<sup>A</sup>T<sub>E</sub>X automatically itemizes lists.

- Veni
- Vedi
- Veci

```
\begin{itemize}  
  \item Veni  
  \item Vedi  
  \item Veci  
\end{itemize}
```

# Enumerated Lists

L<sup>A</sup>T<sub>E</sub>X automatically numbers lists items.

1. Veni

2. Vedi

3. Veci

```
\begin{enumerate}  
\item Veni  
\item Vedi  
\item Veci  
\end{enumerate}
```

# Lists

- Lists
  - may
    - \* be
      - nested.

## 1. Lists

- (a) may
  - i. be
    - A. nested.

Exercise: what is the LaTeX source that generates these lists?

## Math mode — inline

Physics majors:  $F_G = \frac{Gm_1m_2}{r^2}$  makes an attractive inline example.

Physics majors:

`$F_G = \frac{Gm_1m_2}{r^2}$`

makes an attractive inline example.

## Math mode — inline

Chemistry macros:

1 Liter  $C_2H_5OH$   $\xrightarrow{12h}$  600<sub>mg</sub> acetaminophen.

```
Chemistry macros:
```

```
1~Liter  $C_2H_5OH$ 
```

```
 $\begin{array}{c}$ 
```

```
12h \\
```

```
\longrightarrow
```

```
\end{array}
```

```
 $600_{\text{mg}}$  acetaminophen.
```

## Math mode — inline

Mathematics and English majors will recognize that  $(2b \vee \neg 2b) \Rightarrow x \in Q$ ,  
 $\forall$  questions  $Q$ .

```
Mathematics and English majors  
will recognize that  
$(2b \lor \neg 2b)  
\Rightarrow x \in Q,$  
$\forall$ questions $Q$.
```

## Equation Example

Use “eqnarray” to have numbered equations.

$$\rho = \frac{\lambda}{\mu} \quad (1)$$

$$\mu\rho = \lambda \quad (2)$$

```
\begin{eqnarray}
\rho & = & \frac{\lambda}{\mu} \\
\mu\rho & = & \lambda
\end{eqnarray}
```

## Equation Example

Use `\[` and `\]` to have unnumbered one-liners.

$$\sum_{k=0}^{\infty} a_k x^k$$

```
\[  
\sum_{k=0}^{\infty} a_k x^k  
\]
```

# Equation Example

Use “left” and “right” to bracket a matrix.

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

```
\[
\left[
\begin{array}{cccc}
1 & 0 & 0 & 0 \\
0 & 1 & 0 & 0 \\
0 & 0 & 1 & 0 \\
0 & 0 & 0 & 1
\end{array}
\right]
\]
```

# Tables

In  $\text{\LaTeX}$  you can build simple tables and those that are quite complex.

1	Begin the table
2	Justify the columns
3	Put ampersand between entries
4	Put slashes at end of entries
5	Put a label
6	Put a caption

Table 2: How to build a table.

# Tables

```
\begin{table}
\begin{tabular}{||r||l||}
\hline
1 & Begin the table \\
2 & Justify the columns \\
3 & Put ampersand between entries \\
4 & Put slashes at end of entries \\
5 & Put a label \\
6 & Put a caption \\
\hline
\end{tabular}
\caption{How to build a table.}
\label{tab:howtable}
\end{table}
```

# EPS Figures

Remember we used the *epsf* package to incorporate Encapsulated PostScript (EPS) files into L<sup>A</sup>T<sub>E</sub>X.

In the preamble...

```
\usepackage{epsf}
```

## EPS Figures

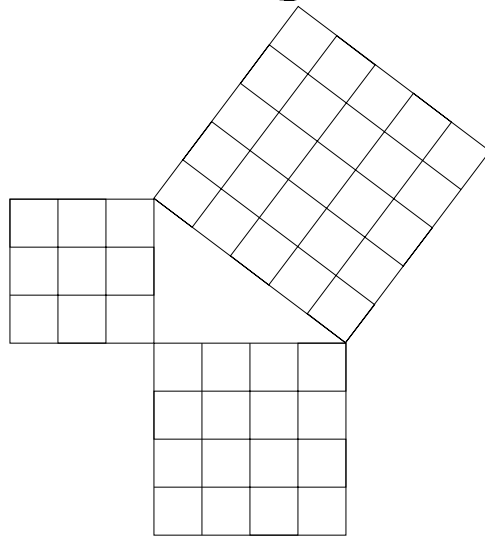


Figure 1. The triangle.

In Figure 1, we see that Pythagoras' equation holds, that is,  $a^2 + b^2 = c^2$ .

## EPS Figures, cont.

In Figure~\ref{fig:pyth}, we see that Pythagoras' equation holds, that is,  $a^2 + b^2 = c^2$ .

```
\begin{figure}
  \epsffile{triangle.eps}
  \caption{The triangle.}
  \label{fig:pyth}
\end{figure}
```

## Tables and Figures

Tables and figures float to the top of the page that refers to them.

They are numbered in order through the document.

They are collected by “listoffigures” and “listoftables” commands.

# L<sup>A</sup>T<sub>E</sub>X Review

- Title page, Abstract, Acknowledgements, TOC, LOF, LOT
- Chapter, Section, Subsection, Subsubsection
- Enumerated lists, Itemized lists
- Math equations
- Tables
- Figures

Please remember

*<http://etd.vt.edu>*

and

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<ETD>

Electronic Thesis and Dissertation Project

Virginia Tech