Latex Thesis

Prerequisite:

- **Advanced WP:Latex**

Instructor:

I/S-AthenaTraining Group

What this course will cover

- Parts of a thesis
- Getting the thesis template files
- Sectioning commands
- Figures and Tables
- Cross-referencing
- Bibliography and citations
- Changing the template defaults
- Running Latex — the thesis job-flow
- Previewing and printing
- Help and advice

Why use Latex for your Thesis?

1. Produces a thesis that conforms to all MIT requirements
2. Makes revisions much easier
3. Automatically provides:
   - Title and Abstract pages
   - Table of contents
   - Lists of figures, tables
   - Numbering of chapters, sections, subsections, pages, figures, and tables
   - Appendices
   - Bibliography
4. Assists in formatting of:
   - Footnotes
   - Quotations
   - Citations
   - Cross-referencing of text and figures, *and*
5. Produces a thesis that conforms to *all* MIT requirements.

Parts of any MIT Thesis

- Title page
- Abstract page
- Dedication page
- Table of Contents
- List of Figures
- List of Tables
- Introductory Chapter
- Chapters, Sections, and Subsections
- Footnotes
- Citations
- Figures and Tables
- Appendices
- Bibliography

NOTE: Footnotes and quotations were covered in Advanced Word Processing: Latex, the prerequisite for this course.

Getting the Needed Files

```
athena% mkdir ~/thesis
athena% attach thesis
athena% cd ~/thesis
athena% cp /mit/thesis/tex/* .
athena% ls
README.bibliography  appb.tex       main.bib
README.chapter       biblio.tex     main.bib.info
README.main          chap1.tex      main.tex
README.text          contents.tex   mitthesis.cls
abstract.tex         cover.tex      propcover.tex
appa.tex             lgrind.sty
```

Note the "." at the end of the **cp** command!

Be careful not to use the **-r** option with **cp**. There are two directories in **/mit/thesis/tex** that you don't want: **2.09/** and **RCS/**

What the Files Are For

style files — leave these alone, just make sure they're in **~/thesis**

mitthesis.cls — defines the Thesis class

contents.tex — commands to generate table of contents and lists of figures and tables

biblio.tex — pointer to file containing all your bibliographic information (you'll change this file only if you decide to format your bibliography "manually")

lgrind.sty — style file for including code

template files — you'll modify these, to specify some information about your thesis.

abstract.tex — contains the text of your abstract

cover.tex — fill in the information for your title page

main.tex — a `root' file that points to all the other files

main.bib — fill in information for bibliography

body file

chap1.tex — A sample first chapter. You'll make copies of this called **chap2.tex, chap3.tex,... appa.tex, appb.tex**, etc. to hold the body of your thesis and appendices

other files

README.*foo* — several files with info on using the pieces of the template

propcover.tex — helpful template for writing a thesis proposal

main.bib.info — using the bibliography templatesl

cover.tex

```
% -*-latex-*-
% $Log: cover.tex,v $
...
%
% Revision 1.1  92/04/22  13:08:20  epeisach
\title{Culinary Properties of Hyperkinetic Desert Fowl}
\author{Wile E. Coyote, Genius}
\department{Department of Mechanical Engineering}
% If the thesis is for two degrees simultaneously, list them both
% separated by \and like this:
% \degree{Doctor of Philosophy \and Master of Science}
\degree{Bachelor of Science in Mechanical Engineering}
\degreemonth{May}
\degreeyear{2004}
\thesisdate{May 30, 2004}

%% By default, the thesis will be copyrighted to MIT.  If you need to copyright
%% the thesis to yourself, just specify the `vi' documentclass option.  If for
%% some reason you want to exactly specify the copyright notice text, you can
%% use the \copyrightnoticetext command.
%\copyrightnoticetext{\copyright IBM, 1990.  Do not open till Xmas.}

% If there is more than one supervisor, use the \supervisor command
% once for each.
\supervisor{R.O. Drunner}{Professor}
\supervisor{Samuel Yosemite}{Associate Perfesser}

% This is the department committee chairman, not the thesis committee
% chairman.  You should replace this with your Department's Committee
% Chairman.
\chairman{Nora Quairdeau}{Chairman, Departmental Committee on Department
Committees}

...
\section*{Acknowledgments}
```

I would like to thank ``Checkers'' LaVacchia; the crew of the Yankee Zulu; the guys down at Good News Garage, for keeping me rolling; and the night staff at the Hummingbird Hotel \& Grill, for keeping me sane. Also Doctor Foo, Doctor Woo (are you with me?), Regnad Kzin, and my Aunt Phibian, for loyally supporting me though all of this.

Finally, my most sincere gratitude to Emma Nemms, Nola Mae Tangerine, and Heide Ho - they'll know why.

```
\vfill
\parbox[t]{\textwidth}{This research was supported in part by Mom and Dad van
der Graaf, ZAP Adult-style Cola, and a grant from the Robert ``Wood Johnson''
Foundation.}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% -*-latex-*-
```

A Sample Title Page

Culinary Properties of Hyperkinetic Desert Fowl

by

Wile E. Coyote, Genius

Submitted to the Department of Mechanical Engineering
in partial fulfillment of the requirements for the degree of

Bachelor of Science in Mechanical Engineering

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

May 2004

Author .....
Department of Mechanical Engineering
May 30, 2004

Certified by .....
R.O. Drunner
Professor
Thesis Supervisor

Certified by .....
Samuel Yosemite
Associate Perfesser
Thesis Supervisor

Accepted by .....
Nora Quairdeau
Chairman, Departmental Committee on Department Committees

A Sample Abstract Page

Culinary Properties of Hyperkinetic Desert Fowl

by

Wile E. Coyote, Genius

Submitted to the Department of Mechanical Engineering
on May 30, 2004, in partial fulfillment of the
requirements for the degree of
Bachelor of Science in Mechanical Engineering

Abstract

In this thesis, I designed and implemented a compiler which performs optimizations that reduce the number of low-level floating point operations necessary for a specific task; this involves the optimization of chains of floating point operations as well as the implementation of a "fixed" point data type that allows some floating point operations to simulated with integer arithmetic. The source language of the compiler is a subset of C, and the destination language is assembly language for a micro-floating point CPU. An instruction-level simulator of the CPU was written to allow testing of the code. A series of test pieces of codes was compiled, both with and without optimization, to determine how effective these optimizations were.

Thesis Supervisor: R.O. Dreamer
Title: Professor

Thesis Supervisor: Samuel Yosemite
Title: Associate Professor

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A Sample Acknowledgements Page

Acknowledgments

I would like to thank "Checkers" LaVecchia, the crew of the Yankee Zulu; the guys down at Good News Garage, for keeping me rolling; and the night staff at the Hummingbird Hotel & Grill, for keeping me sane. Also Doctor Fox, Doctor Woo (are you with me?), Reginald Kuhn, and my Aunt Philbin, for loyally supporting me though all of this.

Finally, my most sincere gratitude to Emma Nevans, Nola Mae Tangerine, and Heide Ho - they'll know why.

This research was supported in part by Mom and Dad van der Graaf, ZAP Adult-style Cola, and a grant from the Robert "Wood Johnson" Foundation.

Table of Contents

Contents

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Sectioning Commands

\chapter{chapter-name**}**

\section{section-name**}**

\subsection{subsection-name**}**

\subsubsection{subsubsection-name**}**

\paragraph{paragraph-name**}**

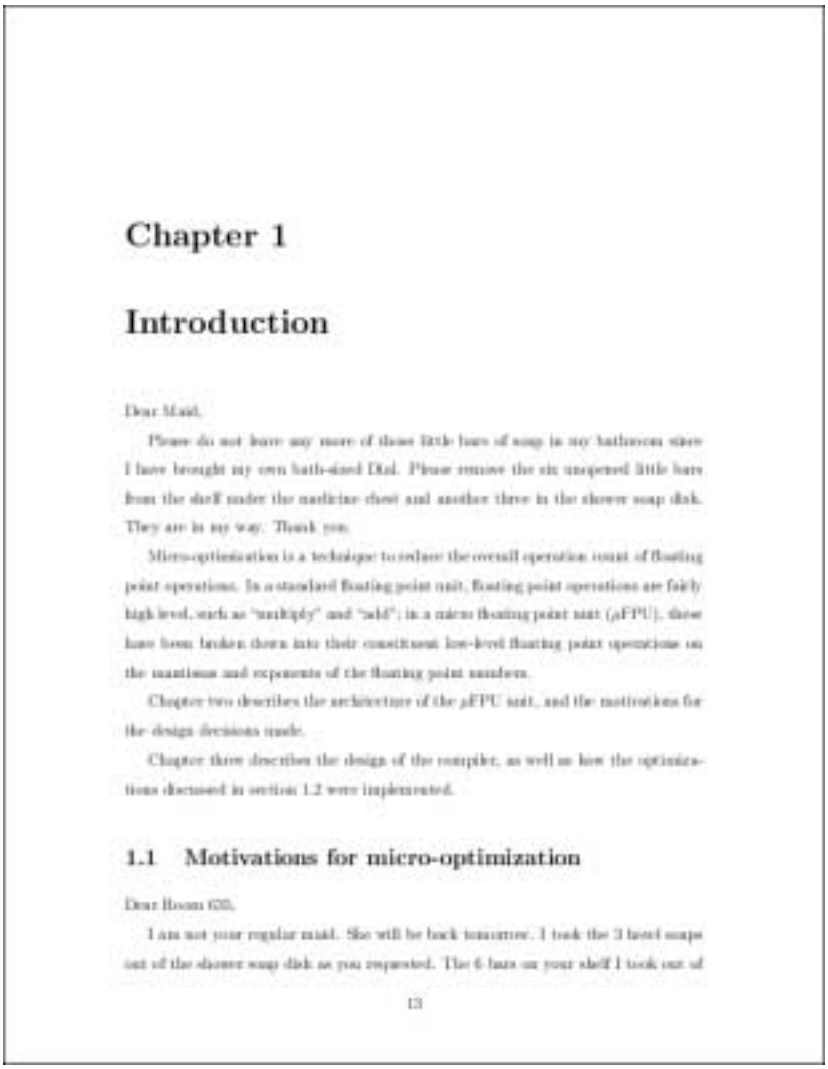
\subparagraph{subparagraph-name**}**

Use the same commands for chapters and for appendices. Elsewhere, you'll tell Latex which is which.

chap1.tex

```
%% This is an example first chapter. You should put chapter/appendix that you
%% write into a separate file, and add a line \include{yourfilename} to
%% main.tex, where `yourfilename.tex' is the name of the chapter/appendix file.
%% You can process specific files by typing their names in at the
%% \files=
%% prompt when you run the file main.tex through LaTeX.

\chapter{Introduction}

Dear Maid,

Please do not leave any more of those little bars of soap in my bathroom since I
have brought my own bath-sized Dial. Please remove the six unopened little bars
from the shelf under the medicine chest and another three in the shower soap dish.
They are in my way. Thank you.

...

\section{Motivations for micro-optimization}

Dear Room 635,

I am not your regular maid. She will be back tomorrow. I took the 3 hotel soaps out
of the shower soap dish as you requested. The 6 bars on your shelf I took out of
your way and put on top of your Kleenex dispenser in case you should change your
mind.

...

\section{Description of micro-optimization}\label{ch1:opts} I did not remove the 3
complimentary soaps which are always placed inside the medicine cabinet for all new
check-ins and which you did not object to when you checked in last Monday.

...

The optimizations that the compiler can perform fall into several categories:

\subsection{Post Multiply Normalization}

When more than two multiplications are performed in a row, the intermediate normal-
ization of the results between multiplications can be eliminated.

...

The new maid must have thought I was a new check-in today, since she left another 3
bars of hotel soap in my medicine cabinet. In just 5 days here I have accumulated
24 little bars of soap.

\subsection{Block Exponent}

In a unoptimized sequence of additions, the sequence of operations is as follows
for each pair of numbers ($m_1$,$e_1$) and ($m_2$,$e_2$).

...
```

Sectioning (result)



Chapter 1

Introduction

Dear Maid,

Please do not leave any more of those little bars of soap in my bathroom since I have brought my own bath-sized Dial. Please remove the six unopened little bars from the shelf under the medicine chest and another three in the shower soap dish. They are in my way. Thank you.

Micro-optimization is a technique to reduce the overall operation count of floating point operations. In a standard floating point unit, floating point operations are fairly high level, such as "multiply" and "add"; in a micro floating point unit (μFPU), these have been broken down into their constituent low-level floating point operations on the mantissas and exponents of the floating point numbers.

Chapter two describes the architecture of the μFPU unit, and the motivations for the design decisions made.

Chapter three describes the design of the compiler, as well as how the optimizations discussed in section 1.2 were implemented.

1.1 Motivations for micro-optimization

Dear Room 635,

I am not your regular maid. She will be back tomorrow. I took the 3 hotel soaps out of the shower soap dish as you requested. The 6 bars on your shelf I took out of

Figures and Tables

Latex lets you leave space for figures and tables:

```
His mouth dry with nervousness, Quail followed the two
technicians from the office; what happened next depended
on them.

{\em Will I actually believe I've been on Mars?\/} he
wondered. {\em That I managed to fulfill my lifetime
ambition? \/} He had a strange, lingering intuition that
something would go wrong. But just what —— he did not
know.

He would have to wait to find out.

\begin{figure}
\vspace{1.5 in}
\caption{God and Einstein Playing Dice}
\label{fig:dice}
\end{figure}

The intercom on McClane's desk, which connected him with
the work-area of the firm, buzzed... ``Mr.\ McClane, I'm
sorry to bother you but something rather ominous has
come up....''
```

The **\label** is for cross-referencing, which we will discuss in this course.

A Sample Figure

Figure 2-1: God and Einstein Playing Dice

His mouth dry with nervousness, Quail followed the two technicians from the office; what happened next depended on them.

Will I actually believe I've been on Mars? he wondered. *That I managed to fulfill my lifetime ambition?* He had a strange, lingering intuition that something would go wrong. But just what – he did not know.

He would have to wait to find out.

The intercom on McClane's desk, which connected him with the work area of the firm, buzzed... "Mr. McClane, I'm sorry to bother you but something rather ominous has come up..."

2.4 ZBS Foundation, Fort Edward, New York.

2.4.1 The Third Man, with Orson Welles

The continuing stories of Harry Lime, that morally character from the Graham Greene novel/movie, "The Third Man." Harry, played by Orson Welles, is a suave, good-hearted con man. The stories are set in Algiers, Egypt, Greece, Paris, Istanbul, Havana, etc. The music, sounds and accents capture the feel of these exotic locations. Good stories, good productions, and Welles is having a ball, he's awesome. 18 stories. A fine radio series. 9 hours.

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To insert the figure:

- include a PostScript file, or
- use Latex's picture environment
- print it, cut it out, paste it in place

Notice that the figure has been "floated" to the top of the page.

Tables

Tables are handled like figures:

```
\begin{table}
\vspace{2 in}
\caption{God vs. Einstein – Results of Dicegame}
\label{tbl:resultdice}
\end{table}
```

To insert the table:

use Latex's built-in tabular and tabbing environments
print it, cut it out, paste it in place

More About Figures and Tables

1. Figures and tables are numbered consecutively with each chapter. (**Figure 3.2** is the second figure in chapter 3.)

2. Latex prepares a separate **List of Figures** and **List of Tables.** (They are numbered separately — there could be a **Table 3.2** as well as a **Figure 3.2**)

3. Figures and Tables are "floated"
   - the vertical space with its caption won't be broken across two pages.
   - Latex may float the figure to a following page
   - Latex will try to put the figure at the top or bottom of a page, or on a page that contains only figures and tables.

4. The *Latex User's Guide* contains detailed information about the Latex environments **picture, tabular,** and **tabbing** — which are often used with figures and tables.

5. The Athena document *More Latex on Athena: MIT Thesis* and the **olc** stock answers explain the process for including a PostScript file in a Latex document.

Cross-References

.tex file — chap4.tex:

```
In section~ref{sec:liab} (on page~pageref{sec-liab}) we
will examine some precedent-setting product liability
cases.
```

.tex file — chap6.tex:

```
\section{Product Liability}
\label{sec:liab}
The Acme Corporation was involved in some precedent-
setting cases, the best  known being {\em W. E. Coyote
v. Acme, Inc. (In re Acme Inc.),\/} 127 Bankr. 918  (9th
Cir. 1991)
```

Latex output in chapter 4:

In section 6.3 (on page 154) we will examine some precedent-setting product liability cases.

Latex output in chapter 6, pg 154:

6.3 Product Liability

The Acme Corporation was involved in some precedent-setting cases, the best known being *W. E. Coyote v. Acme, Inc. (In re Acme Inc.),* 127 Bankr. 918 (9th Cir. 1991)

Using Cross-References

\caption{caption-text**}**
\label{keyword**}**
~\ref{keyword**}**
~\pageref{keyword**}**

Latex wizards recommend a *keyword* labeling scheme that includes a type: **fig** for figure, **tbl** for table, **eq** for equation, **sec** for section, etc.

\label{type:description**}**

```
\section{Gambling with Physicists}
\label{sec:gambling}
          (some text)
\caption{God and Einstein Playing Dice}
\label{fig:dice}

See Figure~\ref{fig:dice} on
page~\pageref{fig:dice} in
section~\ref{sec:gambling}.
```

Result:
See Figure 4.9 on page 56 in section 4.3.

---

the **~** means "insert a space here, but don't allow a linebreak"
IMPORTANT: The **\label** command must come after **\caption**

Bibliography

There are two different ways to produce your bibliography:

Automatically — you put the information into a standard template, and let a related program named **Bibtex** format it for you.

- Advantages: You just fill in the blanks in some predefined templates, and **Bibtex** does all the formatting for you.
- Disadvantages: You may not get exactly the format your department demands, and you have to put your thesis through an extra couple of processing steps. (However, you can select different styles with the **\bibliographystyle** command.)

Manually — you format each bibliographic entry yourself, exactly as you want it to appear.

- Advantages: You get everything in exactly the format you want, and you don't have to run your thesis through **Bibtex**.
- Disadvantages: This is much more time-consuming, you may make unnoticed format mistakes, and you have to know the correct formats. Also, references within your thesis will not be automatically included in your bibliography.

Bibliography — results

Bibliography

.

.

.

[16] Malaclypse the Younger. *Principia Discordia*. Loompanics Unlimited, Port Townsend, WA, 1881.

[17] M. Moliere and T.J. Teru. Inaccuracies in recent identifications of ancient Nullian artifacts. *Archeology Bulletin*, Summa Nulla, 2105.

[18] Plato Schrimp. Dolphin-assisted mapping and excavation of the Atlantis-β sites. *Journal of Cetacean Research*, New Cambridge, MA, 2048.

[19] T.J. Teru and M. Moliere. Teru's Latest: Ancient Nullians used Giant Spoons for Week-long Orgies! *Zeezeebu Star*, Summa Nulla, 2104.

.

.

.

- The Bibliography pages will look about like this, unless you choose a different style.
- Notice the numerical "item labels" for each entry.

Bibliography (manual)

\bibitem{*key***}** *formatted bibliographic info*

Delete all the text from the file biblio.tex, and enter the formatted information instead, in a **thebibliography** environment.

```
\begin{thebibliography}{99}

                .
                .
                .

\bibitem{my:prindis} Malaclypse the Younger. {\emph Principia Discor-
dia.} Loompanics Unlimited, Port Townsend, WA, 1881.

\bibitem{tjt:moledig2} T.J. Teru and M. Moliere. Teru's Latest: Ancient
Nullians used Giant Spoons for Week-long Orgies! {\emph Zeezeebu Star},
Summa Nulla, 2104.

\bibitem{ps:dolph} Plato Schrimp. Dolphin-assisted mapping and Excava-
tion of the Atlantis-\beta sites. {\emph Journal of Cetacean Research},
New Cambridge, MA, 2048.

\bibitem{mm:moledig} M. Moliere and T.J. Teru. Inaccuracies in recent
 identifications of ancient Nullian artifacts. {\emph Archeology Bulle-
tin}, Summa Nulla, 2104.

                .
                .
                .

\end{thebibliography}
```

The **{99}** is to indicate the maximum width of the item labels.

Bibliography (automatic)

Don't change anything in the file biblio.tex. Instead, create a new file named main.bib and put your bibliographic information in that new file.

```
            .
            .
            .

@BOOK{my:prindis,
    Author = "the Younger, Malaclypse",
    Title = "Principia Discordia",
    Publisher = {Loompanics Unlimited},
    Address = {Port Townsend, WA},
    Year = 1881}

@ARTICLE{mm:moledig,
    Author = "Moliere, M. and Teru, T.J.",
    Title = "Inaccuracies in recent identifications of ancient
    {Nullian} artifacts",
    Journal = {Archeology Bulletin},
    Year = 2105}

@ARTICLE{ps:dolph1,
    Author = "Schrimp, Plato",
    Title = "Dolphin- assisted mapping and excavation of the
    {A}tlantis-\beta site",
    Journal = {Journal of Cetacean Research},
    Year = 2048}

@ARTICLE{tjt:moledig2,
    Author = "Teru, T.J. and Moliere, M.",
    Title = "Teru's Latest: Ancient Nullians used Giant Spoons for
    Week-long Orgies!",
    Journal = {Zeezeebu Star},
    Year = 2104}

            .
            .
            .
```

See **Latex User's Guide, Appendix B**, for more info on Bibtex.

Citations

\cite{keyword}
\cite{keyword-1,keyword-2**}**
\cite[p. page-num**]{**keyword**}**
\nocite{keyword**}**

```
...and while Prof. Teru's original publication
\cite{tjt:moledig2} attracted great attention in the
popular press \cite{gld:holymoley,ps:guacamole}, later
clarification \cite[p. 42]{mm:moledig} was almost
entirely overlooked outside the field.
```

...and while Prof. Teru's original publication **[19]** attracted great attention in the popular press **[23,47]**, a later clarification **[17, p. 42]** was almost entirely overlooked outside the field.

Citations work the same way for manual and automatic bibliographies.

main.tex

This file is the “glue” that holds the thesis together.

```
% -*- Mode:TeX -*-

%% The documentclass options along with the pagestyle can be used to generate
%% a technical report, a draft copy, or a regular thesis. You may need to
%% re-specify the pagestyle after you \include cover.tex. For more
%% information, see the first few lines of mitthesis.sty.

\documentclass[12pt,vi,twoside]{mitthesis}
\usepackage{lgrind}
\pagestyle{plain}

%% This bit allows you to either specify only the files which you wish to
%% process, or `all' to process all files which you \include.
%% Krishna Sethuraman (1990).

\typein [\files]{Enter file names to process, (chap1,chap2 ...), or `all' to
process all files:}
\def\all{all}
\ifx\files\all \typeout{Including all files.} \else \typeout{Including only
\files.} \includeonly{\files} \fi

\begin{document}

\include{cover}
\pagestyle{plain}
\include{contents}
\include{chap1}
\include{chap2}
\appendix
\include{appa}
\include{appb}
\include{biblio}
\end{document}
```

Be sure to have an **\include** for each chapter and appendix file.

Common modifications to main.tex

\documentclass [option-1,option-2,...option-n**] {mitthesis}**

```
\documentclass[12pt,twoside,vi]{mitthesis}
```

- "Standard" Latex options — described in Appendix C.4.1 of the *Latex User's Guide*:
  - **11pt** — Eleven-point, increases the normal type size to 10% larger than the default (10-point).
  - **12pt** — Twelve-point, 20% larger than the default. This is recommended.
  - **leqno** — Puts formula numbers on left side in equations and eqnarray environments.
  - **fleqn** — Left-aligns displayed formulas.

- "Home-grown" options, not part of the standard Latex package. Read about them in **`mitthesis.sty`**:
  - **vi** — Thesis will be copyrighted to you (per requirements of courses VI and VIII).
  - **upcase** — Makes most of the words on the title page uppercase (see example on p. 17 of *Specifications for Thesis Preparation*).

More main.tex modifications

\documentclass[option-1,option-2,...option-n**] {mitthesis}**

\documentclass[12pt,twoside,vi]{mitthesis}

Other options:

- **lgrind**—Allows inclusion of program source code in your thesis.
- **singlespace**—
  - Entire thesis will be single-spaced.
  - Not recommended for final copy.
  - To single-space a portion of text, use `\begin{singlespace}` and `\end{singlespace}`.
  - For one-and-a-half line spacing, use a onehalfspace environment.

Yet more main.tex modifications

You can modify the mitthesis documentclass for drafts and Tech Reports. Just change the first three uncommented lines in your main.tex file:

For drafts:

```
\documentclass[draft]{mitthesis}
\usepackage{lgrind}
\pagestyle{drafthead}
```

This puts the date and the label *DRAFT* at the bottom of each page.

For Tech Reports:

```
\documentclass[12pt, twoside]{mitthesis}
\usepackage{lgrind}
\pagestyle{headings}
```

This produces a two-sided document with headings.

There is more information about page headings and draft styles in **`mitthesis.sty`**.

Running Latex

athena% **latex main.tex**

```
This is TeX, Version 3.14159 (Web2C 7.3.1)
(main.tex
LaTeX2e <1998/12/01> patch level 1
Babel <v3.6x> and hyphenation patterns for american, french, german,
ngerman, n
ohyphenation, loaded.
(mitthesis.cls
Document Class: mitthesis 1999/10/20
Course VI/VIII thesis style.
...
base/size12.clo)) (/mit/sipb/lib/tex/macros/doublespace.sty)
Copyright given to author, permission to copy/distribute given to MIT.
) (lgrind.sty)
Enter file names to process, (chap1,chap2 ...), or 'all' to process all
files:

files=all
Including all files.
(main.aux (cover.aux) (contents.aux) (chap1.aux) (chap2.aux) (appa.aux)
(appb.aux) (biblio.aux)) (cover.tex
(/afs/athena.mit.edu/system/sun4x_58/srvd-9.0/usr/athena/share/texmf/
tex/latex/
base/omscmr.fd) [1] [2] (abstract.tex) [3] [4]
...
```

(you'll probably get lots of cross-reference errors at first, even if you've made no mistakes)

? **R** *<--- (to continue)*

```
OK, entering \nonstopmode...
```

(or)

? **x** *<--- (to quit running Latex)*

```
athena%
```

Latex creates lots of **.aux** files in your **~/thesis** directory. Don't delete them—they're needed for subsequent runs.

Running Latex (automatic bibliography)

Bibtex needs information from Latex, and Latex needs information from Bibtex, so:

```
athena% latex main.tex
athena% bibtex main
athena% latex main.tex
```

Each time you change or delete a source item (in **main.bib**) or citations (in the body of your thesis), you have to re-run **latex**, **bibtex**, **latex** until it stops telling you to.

The USUAL Latex Job Flow

1. Edit **.tex** file with Emacs.
2. Save the file (**C-x C-s**).
3. Run Latex on .tex file.
   athena% **latex foo.tex**
4. Use error messages to diagnose mistakes.
   (Repeat steps 1-4 until Latex runs without errors.)
5. Preview **.dvi** file.
   athena% **xdvi foo.dvi&**
   (Repeat steps 1-5 until you like the result.)
6. Print the **.dvi** file (if needed).
   athena% **dvips -Pfiber foo.dvi**

To print only some selected pages of the .dvi file, use **dvips** with the **-p** (starting page number) and **-l** (end page number) options. Eg. to print pages 7–22 of foo.dvi:

dvips -Pfiber -p 7 -l 22 foo.dvi

The Thesis Job Flow

To begin preparing a thesis:

- create the **~/thesis** directory
- copy the sample files to **~/thesis**
- fill in the template files: **abstract.tex**, **cover.tex**, **main.tex**

To add a chapter:

- create a file **chap*n*.tex**
- begin the file with a **\chapter{*title*}** command
- add a **\include{chap*n*}** line to **main.tex**
- write/edit **chap*n*.tex**
- add entries to **main.bib** as you work

To run Latex:

```
athena% latex main.tex
```

- correct errors as necessary (don't worry about reference errors yet)
- the latex dialog or the file **main.log** will indicate error locations
- edit the file (with Emacs)
- save the file
- repeat this step if needed

Only needed for "automatic" bibliography:

```
athena% bibtex main
athena% latex main.tex
```

Thesis Job Flow (cont'd)

After running the whole thesis through Latex once, you can process just selected chapters instead:

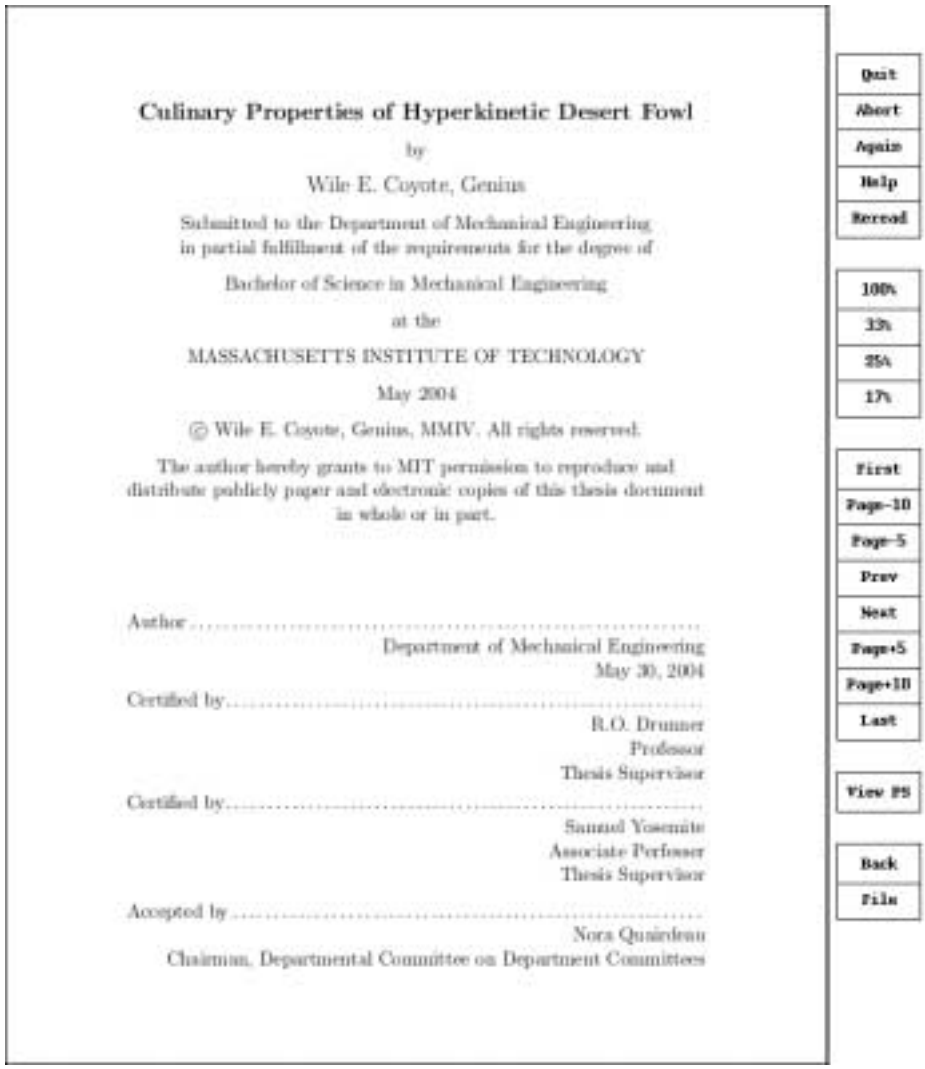
```
athena% latex main.tex
This is TeX, Version 3.14159 (Web2C 7.3.1)
(main.tex
LaTeX2e <1998/12/01> patch level 1
.
.
.
Enter file names to process, (chap1,chap2 ...), or 'all' to process all
files:
```

```
\files=chap3,chap4,appc
```

To produce a FINAL copy:

- use full latex, bibtex, latex sequence again
- preview **main.dvi**
- edit files as needed and repeat until satisfied with results
- print **main.dvi**

Preview



Culinary Properties of Hyperkinetic Desert Fowl

by

Wile E. Coyote, Genius

Submitted to the Department of Mechanical Engineering
in partial fulfillment of the requirements for the degree of

Bachelor of Science in Mechanical Engineering

at the

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```
athena% xdvi main.dvi&
```

Printing a .dvi File

dvips -P*printer filename*.dvi
dvips -P*printer* -p *start* -l *end filename*.dvi

athena% **dvips -Pfiber main.dvi**

This sends a PostScript version of the output directly to the printer of your choice.

athena% **dvips -Ppulp -p 7 -l 22 main.dvi**

This prints only selected pages of the .dvi file, from page 7 to page 22.

Someday Your Prints Will Come

lpq -P*printername*
lprm -P*printername job#*

```
athena% lpq -Pbias

M11-116-P.MIT.EDU... bias is ready and printing
Rank     Owner   Job  Files                 Total Size
active   tsmonk   23  epistrophy         35713236 bytes
1st      joeuser   4  (standard input)     421582 bytes
2nd      dryfoo   18  Andrew_slides         72253 bytes

athena% lprm -Pbias 4

athena% lpq -Pbias

M11-116-P.MIT.EDU... bias is ready and printing
Rank     Owner   Job  Files                 Total Size
active   tsmonk   23  epistrophy         35713236 bytes
1st      dryfoo   18  Andrew_slides         72253 bytes

athena% lpq -Ppython

W20-575-P.MIT.EDU... python is ready and printing
Rank     Owner   Job  Files                 Total Size
active   levitt   17  hookup-docs           44076 bytes

athena% dvips -Ppython main.dvi

athena% lpq -Ppython

W20-575-P.MIT.EDU... python is ready and printing
Rank     Owner   Job  Files                 Total Size
active   levitt   17  hookup-docs           44076 bytes
1st      joeuser   5  (standard input)     421582 bytes
```

``What's the name of this printer?" All printers have their names posted on them. NOTE: Don't try to use lpr to print .dvi files!

Printers currently available

```
athena% cview printers
      -- Printer status as of Tue Jan 27 12:42:13 1998: --
     PRINTER CLUSTER STATUS JOBS PRINTER CLUSTER STATUS JOBS
-------------------------------------------------------------
virus    1-115    up    0      bob       1-142   up    0
plato    1-142    up    0      celine    2-225   up    0
medea    4-035    up    0      pandora   4-035   up    0
sanda    4-167    up    0      barker   10-600   up    0
savion  12-182    up   17      bias     12-182   up    0
linus  W91-130    up    0      thesis    4-082   up    0
hayden 14S-010    up    0      helios   56-129   up   68
sum    20B-219    up    0      electra  37-324   up    0
varan   37-324    up    0      peecs    38-370   up    0
homer   66-080    up    0      pindar   66-080   up   42
picus  E51-007    up    0      ajax    W20-575   up    0
ceres  W20-575    up    0      python  W20-575   up    0
fiber  W20-575    up    0      pulp    W20-575   up    0

athena%
```

- The printer **thesis**, in the MIT Copytech Center (in 11-004), is for final copy of your thesis only (archival bond paper). Copytech hours are 8am-9pm Monday through Friday, and 8am-5pm on Saturday.

- You can also run athena% **xcluster &**

Here's the Answer

Two common questions:

- "How do I include program source code?"
- "How do I include PostScript files?"

See the Athena document **More Latex on Athena: MIT Thesis** at **`http://web.mit.edu/olh/Latex/thes-toc.html`**
(printed copies available at CopyTech -- ask for AC-52).
Also see the **olc stock answers.**

Advanced topics:

- Hairy mathematical expressions in your thesis?
- Complicated tables?
- Other unusual features?

Find nearly all the answers in the **Latex User's Guide** (available at The Coop). Buy your own copy, now, before the rush.

Really Stumped?

- Don't stay that way!
- Remember, your main task is writing your thesis. Latex is supposed to make the job much easier — and it will!

Extra Stuff to Try

- page headers and footers
- advanced tabbing
- advanced figures and tables
- defining macros
- BibTeX options
- printing output in landscape format

Information on all of these topics can be found in **on-line help** (see **`http://web.mit.edu/olh/Latex/rep-toc.html`**) and the **olc stock-answers**.

For answers to really nitty-gritty Latex questions, you will need the Latex manual.

Do you begin to get the idea that we think you should get a copy of the Latex manual?

To Learn More

Help — there's is lots of it on-line:

- Athena **On-Line Help**: these are all available at **`http://web.mit.edu/olh/Latex/`**
  - *Essential LaTeX on Athena* (AC-50)
  - *More Latex on Athena: Reports & Advanced Topics* (AC-51)
  - *More Latex on Athena: MIT Thesis* (AC-52)
  - *Using Latex at Athena: Local Guide*
- olc stock-answers have information about basic to advanced topics in Latex.
- The **`/mit/thesis`** directory has all the files you will need, as well as information explaining how to use the files.
- For advanced Latex users: look in **`/mit/sipb/lib/tex`** for fancy fonts, macros etc. to use.
- Don't forget the 'man pages'

  athena% **man** *command*

Printed Documentation:

- The Latex manual is available at the Coop and the computer section of many bookstores
- Athena documents AC-50, AC-51, and AC-52 are all available in print form at CopyTech (11-004)

Advice for Thesis Writers

Keep backup copies on-line.

```
athena% mkdir ~/thesis_backup <—-(once only!)
athena% cd ~/thesis
athena% cp * ~/thesis_backup
```

Learn about making removable-media copies:

1. From On-Line Help:
   see **http://web.mit.edu/olh/Account/**
   or just start with `athena% help account`

2. You should also read the man pages on
   - **tar** — for making archival copies of files and directories, and
   - the file-compression utilities **compress** and **gzip**.

If you're still using **rm** to get rid of unwanted files:
- Break The Habit NOW!
- Learn to use delete instead.

```
athena% man delete
```

More Advice

- If cross-references, table of contents, lists of figures/tables appear wrong, try the command
  athena% **`latex main.tex`**
  again.

- Until you're finished, just process individual chapters, if that's all you've changed — it's faster.

- Avoid excessive printing. This is being kind to the other thesis hackers, *and will save you money.*

- If you must print, print only the pages you need to see.To find out about more printing options, read the man page on **dvips**.

- Use **lpq** to guide you: Do your printing at off-peak hours, and at less-busy printers.

Further Advice

If you are a senior and run out of disk space, call the accounts administrator at x3-1325, or send mail to *accounts@athena*.

Start your thesis early! As thesis deadlines approach, there is increasing contention for diskspace, printers, consultant assistance, workstations, etc.

~~~~~~~~~~~~~~~~~~

Remember Athena's Thesis Admonition:

Athena's Thesis Admonition

Your thesis will take a week or two *longer* than you expect, even if you remember **Athena's Thesis Admonition.**

~~~~~~~~~~~~~~~~~~

And finally:

Don't Panic!

Minicourse Questionnaire (cont'd)

Please fill out this side of the page AFTER taking the minicourse.

(please circle one in each row)

5. How was the instructor's pace?	Too SLOW	1	3	5	3	1	Too FAST
6. How difficult was the course material?	Too EASY	1	3	5	3	1	Too HARD
7. How well did you understand the instructor?	POORLY	1	2	3	4	5	PERFECTLY
8. How well did the instructor answer questions?	POORLY	1	2	3	4	5	PERFECTLY

9. Did you have any questions you didn't ask?
   If yes, why not? _____

10. Was any topic not covered that you had expected to learn in this course?
    If so, what topic? _____

11. Why did you take this course? (check one)
    - ❏ General Interest
    - ❏ Required for a course. (Which? _____)
    - ❏ To be able to do something. (What? _____)

12. Besides Athena, how much computer experience do you have?
    (None) 1 2 3 4 5 (Lots)

13. How often have you used Athena in the past? (check one)
    - ❏ never
    - ❏ a few times
    - ❏ once a week
    - ❏ several times a week
    - ❏ daily

14. How would you estimate your knowledge of the subject of this course...
    ...Before taking it? (None) 1 2 3 4 5 (Lots)
    ...After taking it? (None) 1 2 3 4 5 (Lots)

15. Additional comments:

Your responses to this questionnaire will help us improve our minicourses.
Please take a few moments to fill it out.

Minicourse Questionnaire

Please fill out this side of the page BEFORE the class begins.

Minicourse Instructor: _____ Today's Date: _____

1. MIT status (circle one): 1 2 3 4 G FACULTY STAFF OTHER

2. Is this your first Athena minicourse? (circle one): YES NO

3. If **NO**, check (✓) those you have already taken:

- ❑ Athena: First Course
- ❑ Working on Athena
- ❑ Word processing Options
- ❑ EZ
- ❑ Latex
- ❑ Latex Thesis
- ❑ FrameMaker
- ❑ FrameMaker Thesis
- ❑ Other (please specify): _____
- ❑ Math Software Overview
- ❑ Matlab
- ❑ Xess
- ❑ Maple
- ❑ Information Resources
- ❑ HTML
- ❑ Serious Emacs
- ❑ Customization (Dotfiles)

4. How did you find out about THIS minicourse? (only ONE answer, please)

- ❑ Orientation ("Hitchhiker's") Guide
- ❑ Athena Orientation packet
- ❑ Advertisement in *The Tech*
- ❑ Advertisement in *Voo Doo*
- ❑ Flyers/Poster in hallways
- ❑ Poster in an Athena cluster
- ❑ Friend told me
- ❑ Professor or TA recommended
- ❑ Description in previous minicourse
- ❑ Other (please specify): _____