Contents

1 Introduction

This document[1] explains how to format a Florida State University thesis or dissertation using the computer typesetting system $\LaTeX\,2_\varepsilon$. Formatting standards are under the control of a document class called `fsuthesis`. Over the past year or so, we have moved to using the default `report.cls` document class, and to require the `fsuthesis.sty` input as well. Modifications during this period of time now allow students to run `pdflatex` on their documents and go directly to PDF output.

`fsuthesis.sty` continues to be a "work in progress" and I expect further revisions to be added in the next several months. At this point in time there is now only one file necessary, and you may modify it as you wish to provide the paper copies as well as the electronic submission file.

Fall 2004:

Fall 2002: Recent modifications (Fall 2002) were made to the files - allowing 6.5 inch width on the page, as well as including a "committee page" which is a replica of the "signature page" but without the lines, and with additional text at the bottom of the page. In Fall 2002, The Graduate Office began a pilot program to accept electronic dissertations. The "signature page" is still required, but is not to be a part of the final electronic file. Hence, there is now a new command `\makecommitteepage` which I recommend placing in a file as the only command. A separate file is included in the distribution, called `hardcopy.tex`, which you may use for the additional page copies which are required by the Graduate Office.

As of March 1, 2003, the graduates office required the following copies:

- For paper submissions: three copies, with three signature pages and two DAI abstract copies.
- For electronic submissions: the electronic PDF file with a "committee page" rather than a "signature page", three copies of the title page, and two DAI abstract copies.

This guide is provided to be used in conjunction with *Guidelines & Requirements for Thesis, Treatise, and and Dissertation Writers* (henceforth referred to as *Guidelines*), which is published by the graduate school of the Florida State University. It is recommended that you obtain a recent copy of the above guidelines during a personal visit to the graduate office. Make this first visit *before* starting on a thesis or dissertation. The number of contacts with the thesis office averages five: one initial visit, one after chapter 1 is finished, some question and answer sessions followed by a reading before the thesis defense and a final reading after all revisions.

The graduate office, like professional journals in science and engineering, has their own set of publication standards. If you want to publish your work, then you have to meet these standards. In the case of the graduate office, the standards and requirements are printed in the *Guidelines*.

For mathematics theses, the editors request that you and your thesis advisor decide on a style guide. This does not mean that you have settled upon *A Manual for Authors of Mathematical Papers* published by the American Mathematical Society. The latter is *not a style guide*. You are expected to choose *The ACS Style Guide* or *The Chicago Manual of Style*. Hybrids adopted from standard journals may also be acceptable.

Presently, only the *Chicago style* (`Chicago.clo`) exists, and is a declared option which is executed by the `fsuthesis.cls` file.

For computer science theses, the same question will be asked: will it be the Chicago Manual or the ACS Guide? More manuals of style are listed in on pages 16–17 of the *Guidelines*.

The basic problem for everyone who writes a thesis or dissertation is the arrangement of topics and results into parts and chapters, sections and subsections, appendices, tables and figures. The

[1] version 3.0m, September 2004

rule book for this process is the graduate school's *Guidelines*. The `fsuthesis.cls` style was created to ease the job of meeting the requirements. It is part of the solution to the problem, but not the entire solution, and it is certainly not the *Guidelines*.

Some knowledge of TEX and LATEX is assumed. If you haven't used either before, then format a simpler and shorter document before tackling a thesis. One document that will be useful is the test file in item 5 below.

Beginners with LATEX should obtain the following documents and sources:

1. Leslie Lamport, *LATEX User's Guide and Reference Manual*, Addison-Wesley Publishing Company, Reading, Massachusetts (1986). ISBN 0-201-15790X (LATEX version 2.09 released 19 April 1986).

2. Helmut Kopka and patrick W. Daly, *A Guide to LATEX2ε, Document Preparation for Beginners and Advanced Users* (Second edition), Addison-Wesley Publishing Company, Reading, Massachusetts (1995). ISBN 0-201-42777-X. (A new revision is due out in 1999.)

3. M. Goossens, F. Mittlebach, and A. Samarin, *The LATEX Companion*, Addison Wesley (1993). ISBN 0-201-54199-8.

4. M. Goossens, S. Rahtz, and F. Mittelbach, *The LATEX Graphics Companion*, Addison Wesley (1997). ISBN 0-201-85469-4.

5. The Florida State University thesis files:

   fsuguide.pdf — documentation in PDF format
   fsuthesis.cls — Thesis style file version 1.0m
   Chicago.clo — style guide specified by fsuthesis.cls
   sample.tex — Sample dissertation driver file, provided as an example
   appendixA.tex — a section of sample file
   appendixB.tex — a section of sample file
   biosketch.tex — a section of sample file
   conclusion.tex — a section of sample file
   front.tex — frontmatter section of sample file
   harcopy.tex — file containing extra pages required by Graduate Office
   introduction.tex – a section of sample file

   The above suite of files are maintained on the CSIT computer system on the CSIT ftp server in a gzipped unix tar file `http://www.csit.fsu.edu/~mimi/tex/fsuthesis/Fsuthesis.tgz` (to be unpacked using 'gnutar xvfz fsuthesis.tgz'). If you require another format, please contact me. It is recommended that you obtain the source from this location rather than copy a friends files – there may be improvements and you have an old file. The most current version will always be located in my web location.

   The `sample.tex` example file uses `fsuthesis.cls` and `Chicago.clo`. Copy these sources also, if they are not available at your site. This source is small but contains figures and tables, bibliography, table of contents, list of figures, list of tables, all the front matter, acknowledgements, abstract, and uses all the sectioning commands. It is useful as an initial test file when setting up your thesis and also as a debugging source when you have problems. Use it to understand figure placement and basic format of a thesis. This source can be obtained by email. Send your request to `mimi@csit.fsu.edu`, or call (850) 644-2440.

6. Documentation for `xfig`, `fig2dev`, `gnuplot`, and `maple`. These unix programs are invaluable for making figures and drawings in LaTeX using `latex` or `pictex` macros. Also learn about `graph` and `x79` for manipulation of plots, and `pltde` and `phase` for solving and plotting differential equations. For use of these packages, you are pretty much on your own.

Some additional references are available, related to thesis production, although not in so direct a manner:

1. The best point of reference is the web page for the TeX Users Group (`http://www.tug.org`), from which you may find tutorials and starting points for getting started with LaTeX 2_ε. See `http://www.tug.org/begin.html`.

2. David J. Buerger, *LaTeX for Engineers and Scientists*, McGraw-Hill, New York (1990), ISBN 0-07-008845-4.[2]

3. Jane Hahn, *LaTeX for Everyone*, PTI, 1991.[3]

4. Michael D. Spivak, *The Joy of TeX — A Gourmet Guide to Typesetting with the AmsTeX macro package*, AMS, 2nd revised edition, 1990, ISBN 0-8218-2997-1.

5. Nelson H. F. Beebe, maintains an extensive set of bibliographic databases, written in BibTeX — Available via the WWW `http://www.math.utah.edu/pub/tex/bib/texbook1.html` and `texbook2.html`.

2 The Document Style

The `fsuthesis` document style is largely adapted from the `report` style with *doublespace* option. `fsuthesis` shares many of the characteristics of the `report` style. For instance, double-sided formatting is available (for convenience), but double columns are not. The 12-point font happens by default. An 11-point is available by specifying the `11pt` option, which can cut many pages off a long thesis. No other type sizes are available. Remarks hereafter are about the 12pt option. The main text of the thesis will be double-spaced automatically, which results in `baselineskip` of about 22pt (72.27pt per inch). If you need to insert single-spaced text, then use the `singlespace` environment, which results in a baselineskip of 14.4pt. Certain pre-defined options in the `fsuthesis` format already use the `singlespace` environment and therefore only wizards should change the basic baselineskip dimensions.

In cases where this manual is not explicit, the style follows the *Chicago Manual*. This is because only the class `Chicago.clo` is currently supported.

2.1 Document Style Options

There are several options that may be supplied:

11pt Set the text in 11pt type. This size uses 5pt fonts for `tiny`, which is less than the required 2mm font height for University Microfilms. Consequently, do not use `tiny` with the 11pt option (this can happen in math mode).

[2]Some basic ideas about spacing control in this book make poor advice for a thesis. It is a useful reference that is perhaps easier to read than Lamport's *Manual*, since it is not as energetic and does not qualify at all as a reference manual.

[3]Recommended for beginners in LaTeX.

12pt Set the text in 12pt type (this is the default).

twoside Format the pages for two-sided printing (not advised).

draft Relax the requirements on box overflow. Do *not* use this for what the thesis editor will see! This is useful for finding those lines with `overfull` boxes.

report Format things appropriately for a technical report. It sets the default to single spacing, and omits the two signature pages.

honors Sets the title page generation from the contents of the control sequence `HONORSTITLE`, which is pre-defined in the format, using the following definitions:

> `honorsdepartment` — e.g., English
> `honorsadvisor` — e.g., Charles D. Smith
> `honorssupervisor` — e.g., Alta V. Wilcox
> `honorsdirector` — e.g., Richard Cummings

The thesis approval pages are not generated. While these options are present within the style file, there has been no record of any honors thesis or dissertation being doing wtih LaTeX 2_ε, and therefore is not used at FSU.

Chicago Sets the default style to the Chicago manual of style. No other manual options currently exist.

3 What the Style Defines

This section lists all the control sequences defined or modified by the style. Later sections will describe these in more detail.
The following standard LaTeX environments are modified by this style:

> `description` environment
> `equation` environment
> `figure` environment
> `quotation` environment
> `quote` environment
> `verse` environment
> `table` environment
> `thebibliography` environment

Although these environments are generally similar to those in other LaTeX style, it is prudent to experiment with the thesis style before assuming anything about the output.

In addition, there are some declarations for new environments, some of which are in common use in mathematics papers. The details may be found in a later section.

> `Proof` environment
> `singlespace` environment
> `doublespace` environment
> `normalspace` environment

`index` environment
`epigraph` environment
`topics` environment

The following optional environments are enabled by the control string `\theoremsetup` in the preamble. They are undefined if the control string does not appear in the preamble.

`theorem` environment
`proposition` environment
`corollary` environment

Many new control sequences are defined, and a number of standard ones modified. None of those listed here should be modified unless you know what you are doing and are willing to experiment. Arguments to the control sequences below are indicated as `#1`, `#2`, and so forth. These arguments are usually ordinary text, but in a few special cases there are extreme limitations on content.
Modified standard LaTeX commands:

`\appendix`
`\author{#1}`
`\biosketch` `\part{#1}`
`\chapter{#1}` **Warning**: Read about this one!
`\section{#1}`
`\subsection{#1}`
`\subsubsection{#1}`
`\subsubsubsection{#1}`
`\paragraph{#1}`
`\index`
`\subitem`
`\subsubitem`
`\titlepage`
`\thebibliography{#1}`
`\listoffigures`
`\listoftables`
`\tableofcontents`

New commands (the arguments are never optional):

`\abstractsection{#1}`
`\fsuabstractpage`
`\chairtitle{#1}`
`\captionONfalse`
`\captionONtrue`
`\captionlineskip`
`\committeeapproval`
`\committeechair{#1}`
`\copyrightrue`
`\copyrighfalse`
`\dedicationpage`
`\dedication{#1}`

```
\degree{#1}
\college{#1}
\departmentchair{#1}
\department{#1}
\fivelevels
\fixchapterheading
\fourlevels
\frontmatter{#1}{#2}{#3}
\frontmatterformat
\graduatedean{#1}
\honorsadvisor{#1}
\honorsdepartment{#1}
\honorsdirector{#1}
\honorssupervisor{#1}
\listoffiguresfalse
\listoffigures
\listoftablesfalse
\listoftables
\mainheader{#1}
\mainheadingwidth
\maintext
\minusfourthline
\minushalfline
\minusline
\noisyfalse
\noisytrue
\normalspace
\optionalfront{#1}{#2}
\plusfourthline
\plushalfline
\plusline
\prefacesection{#1}
\pf
\proof{#1}
\proofline{#1}
\qed
\rawbibliographytrue
\rawbibliographyfalse
\singlespace
\tableofcontents
\thesistype{#1}
\threelevels
\titlepage
\ulabel{#1}{#2}
```

4 Front Matter

The Front Matter consists of the extra pages at the front of the thesis, such as the DAI abstract page, title page and committee signature pages, and the latest addition — a committee page, which is a duplication of the signature page without the signature lines, and with the addition of a footline. The committee page is kept within the electronic file, and the signature page is a separate file, and should probably be run as such. The example file here contains both, but the electronic file must have the command turned off when it is run and the PDF file created. In particular, chapters of the thesis are specifically excluded from the front matter. In the initial stages of writing, the front matter is unimportant, and you can just start with the `\maintext` command described in the next section.

Almost all of the front matter pages can be generated automatically, including the signature pages. A number of declarations must be supplied in the preamble, so that the appropriate places get filled in with the right information (all declarations have one argument #1, which is ordinary text). Declarations must appear in the preamble, that is, *after* `\documentclass{fsuthesis}` and *before* the control `\begin{document}`.

`\thesistype{type}` is the type of thesis. *Type* is either `thesis` for Master's theses, or `dissertation` for doctorates. It is automatically inserted on the title pages. The word goes through directly, so be sure of the spelling!

`\FAMUtrue` should only be used by students majoring in departments belonging to the joint FAMU–FSU College of Engineering. This command will enable you to typeset "FSU–FMU College of..." on your title page. Use this command in your main file before the title block.

`\title{text}` declares the full title of your thesis. If it is too long to fit on one line, then designate line breaks (using \\) at appropriate locations. These lines should be double-spaced, so use the `\\[2ex]` convention and manuall break lines so as to deal with multiple lines.

`\author{name}` declares your full legal name (as this manual says). Multiple authors will have to use explicit line breaks.

`\uauthor{NAME} is an uppercased varian of the \verb` command, required in a couple of places in the frontmatter.

`\degree{name}` is the name of the degree. Sometimes the standard phrases are insufficient, such as when getting a specific degree from an omnibus department.

`\department{name}` is the full name of the department, for example, *Department of Mathematics*.

`\departmentchair{name}` is the name of the department chairperson.

`\chairtitle{name}` is the title of the department chair.

`\defensedate{MONTH, day year}` is the date of the defense.

`\copyrighttrue` is to be used only in cases where the candidate has paid for the copyright. The default is false.

`\majorprof{name}` is the name of your advisor or committee chairperson.

`\majorprofdegree{name}` is the title of your advisor or committee chairperson, usually *professor*.

`\majprofa{name}` is the name of a co-directing advisor

`\majprofadegree{name}` is tht title of co-directing advisor (a)

`\majprofb{name}` is the second name of a co-directing advisor

`\majprofbdegree{name}` is tht title of co-directing advisor (b)

`\commembera{name}`, `\commemberb{name}`, `\commemberc{name}`, `\commemberd{name}`, and `\outcommember{name`
These commands declare the names of up to 5 committee members, and one outside committee member. The committee approval page will end up with the appropriate number of lines for signatures. It is this particular portion of the `fsuthesis.cls` file which is usually "edited" by the candidate for precise control over the layout of the signature page.

`\graduatedean{name}` is the name of the graduate dean (if needed).

`\dedication{words}` declares a dedication. No special formatting, but you can use `\\` to get multiple lines at least. A multi-paragraph dedication is unlikely to work. The dedication page will be omitted if this declaration is not supplied, and you also need to declare `\dedicationtrue`.

`\honorsadvisor{name}` is the name of the Honors advisor in the candidate's home department. Used only for Honors theses.

`\honorsdepartment{name}` is the name of the department, e.g., English. Used only for Honors theses.

`\honorsdirector{name}` is the name of the director of the Honors Program. Only for Honors theses.

`\honorssupervisor{name}` is the name of the person who supervised the Honors thesis. Used only for Honors theses.

4.1 Manual Front Matter

This method requires that you specify each front matter page individually. It is most versatile. For example, it allows your thesis to include things like a glossary, if it needs one. The declarations are to be typed in the order below, just *after* `\begin{document}`:

`\frontmatterformat` This is required in order to set up spacing and page numbering for the front matter. Note that the page numbers are Roman in the front matter and arabic in the main thesis. If you get a strangely numbered table of contents, then suspect this control sequence was somehow omitted.

`\fsuabstractpage` This page uses the contents of `\abstractext{words}` to create the DAI abstract which is bound by the university.

`\abstracttext{words}` The contents of this are used to create the DAI abstract, as well as the `\abstractsection` which typesets the abstract on a page by itself following the Table of Contents.

`\titlepage` Uses text set up by preamble commands *title, author, thesistype, department, degree.* Creates a separate title page with empty page style. Automatically ejects the page.

`\copyrighttrue` Adds a special copyright notice at the bottom of the title page. Used only for those dissertations for which a copyright application has been filed and paid for.

`\approvalneeded` If approval is required by your department, this command provides the necessary lines to the signature page for the `headofdept{name}` and `\deanofschool{name}`. The default is false, as this option is rarely required.

`\abstractsection{Abstract}` Creates a separate abstract. The abstract in this case is set up with the command `\abstractsection{Abstract}`, then your abstract text follows normally. Figures, references, and such are not allowed. Don't use this one *and* the next one: use only one or the other.

`\dedicationpage` Uses the text set up by the preamble command `\dedication` to create a dedication page.

`\tableofcontents` Uses text set up by sectioning commands. Part, Chapter and Section commands cause automatic entries in the `toc` file. This file is made by a pass through LaTeX. It will take two passes to get it right (with no intervening aborts). On each pass, the last table of contents is inserted into the output, and a revised table of contents is written onto the `toc` file.

The table of contents might need extra blank lines and additional text. The command which does this is called

```
\addcontentsline{#1}{#2}{#3}
```

For this purpose, #1 always equals `toc`. The allowed values of #2 are: *part, chapter, section, subsection, groupheader*. The *appendix* uses *chapter*, so **appendix** is not an allowed keyword.

Use #2 equal to *groupheader* to insert text without page references and dot leaders. The value of #3 is any text you want to put on the line. For example,

```
\addcontentsline{toc}{groupheader}{\protect\newline}
```

adds a blank line into the TOC (vertical space). Another useful idea:

```
\addcontentsline{toc}{groupheader}{\vspace{-1pc}}
```

which subtracts 12pts of vertical white space from the `toc` file. A macro `oneline` written for this purpose is:

```
\def\oneline{\addcontentsline{toc}{groupheader}{\vspace{-1pc}}}
```

See page 175 of the LaTeX manual.

`\listoftables` Uses text set up by table environment captions. The list is single-spaced with double-spacing between entries.

An entry in the list of tables is created by the `\caption` control, provided the control `\captionONtrue` is set (the default). The setting of `\captionONfalse` caused the `\caption` control to abort incrementing any counters and no entry is made in the list of tables.

Figure and table captions. Please do not confuse figure captions and table captions. They are different. A figure caption might be a narrative, but a table caption is usually restricted to one or two lines, in general. Anything to be said about the table and its data is either in the text or else is a paragraph *below* the table. How you set the style of tables depends a lot upon the journal where you hope to publish. See journals in your specialty and the standard style guides for examples.

`\listoffigures` Uses text set up by figure environments. List is single-spaced with double-spacing between entries. The best titles are one line long or less. Follow the recommendations above for table titles and list of tables entries. In particular, read above about the `caption` control and the two boolean controls `captionONtrue` and `captionONfalse`.

`\preface{Acknowledgments}{filename}` Generates a preface page, using the text written in the file called `filename`. The contents of this LaTeX source file is up to the author. A *prefacesection* command can do the same job, if the text is included directly.

`\optionalfront{name}` Additional sections may be added using this command. The `name` is the name of the section, such as "Glossary", "List of Symbols", or "List of Abbreviations". This command just sets up the page heading and adds an entry into the table of contents. The format of the section is up to you, and it is advisable first to follow the general format of the other front matter sections, and then to check with the thesis editor before trying to get Format Approval.

5 Vertical space controls

A common problem in a thesis is to control the vertical white space in a way that can be easily undone. It is a mistake to use the common controls of LaTeX, because they cannot be turned off without affecting the internal workings of the typesetter.

Below are control sequences that can be inserted into the document to add and subtract vertical white space. If the document is later used to produce a journal article, then the controls can be disabled by a few lines of definitions in the preamble. For example, a relevant control `\foo` can be easily turned off with `\def\foo{}`. Not so with `\vspace{...}` commands, because they are used internally also, and cannot safely be turned off.

`\minusfourthline` Subtracts vertical space equal to one fourth of a blank line. The definition:

```
\def\minushalfline{\vspace{-0.25\normalbaselineskip}}
```

`\minushalfline` Subtracts vertical space equal to one half of a blank line. The definition:

```
\def\minushalfline{\vspace{-0.5\normalbaselineskip}}
```

`\minusline` Subtracts vertical space equal to one blank line. The definition:

```
\def\minusline{\vspace{-\normalbaselineskip}}
```

`\plusfourthline` Adds vertical space equal to one fourth of a blank line. The definition:

```
\def\plushalfline{\vspace{0.25\normalbaselineskip}}
```

`\plushalfline` Adds vertical space equal to one half of a blank line. The definition:

```
\def\plushalfline{\vspace{0.5\normalbaselineskip}}
```

`\plusline` Adds vertical space equal to one blank line. The definition:

```
\def\plusline{\vspace{\normalbaselineskip}}
```

`\captionONfalse` This boolean causes the `caption` macro to turn off incrementing of the table and figure counters and it causes each use of `caption` to abort producing an entry in the list of figures or the list of tables. Generally used before a continuation table; however, a better solution to multipage tables is to use the `longtable` package.

`\captionONtrue` The default. This boolean causes the `caption` macro to turn on incrementing of the table and figure counters and it causes each use of `caption` to produce an entry in the list of figures or the list of tables, as appropriate.

`\captionlineskip` The spacing of lines in table and figure captions is controlled by the dimension definition

```
\def\captionlineskip{14.4pt}
```

which is the standard for single spacing. This is the default for FSU theses and dissertations. To change the spacing, specify the dimension, for example

```
\def\captionlineskip{15.4pt}
```

could be used to control spacing in a caption that contains many uppercase keywords. The control can be set and reset many times, once for each caption, if needed. Be aware that consistency is required in captions: any major change is expected to be uniform throughout the thesis.

`\mainheadingwidth` The horizontal width in a heading for `part`, `chapter`, `section` commands is controlled by the dimension definition

```
\def\mainheadingwidth{4.25in}
```

To change the spacing increase or decrease the value 4.25, for example:

```
\def\mainheadingwidth{4.5in}
```

The control can be set and reset many times, once for each main heading, if needed. This may happen if the title contains a large math symbol or the breaking of a title into inverted pyramids fails to work properly.

This dimension is also used for headings in the front matter. It is suggested that you change the dimension only after `\maintext` in the LaTeX source. After this point, it can be reset at will.

`\EMX` Controls displayed math formulas that have depth, forcing them to have the same vertical space before and after the display, as is used on other displays. The acronym "EMX" comes from EXtra Math space. It can also be used on inline formulas to keep them from encroaching upon nearby lines. Usage:

```
$$\EMX math-formula $$
$$\EMX math-formula \eqno{(1.1)}$$
$$\EMX math-formula \leqno{(1.2)}$$
\begin{equation}\EMX math-formula \end{equation}
\begin{eqnarray}\EMX math-formula \\
\EMX math-formula \\ ...
\end{eqnarray}
```

To turn off this effect, after the thesis is all full of `\EMX`'s, make the following definition at any point before the disablement is desired.

```
\def\EMX{}
```

The intent of the macro is to invoke it once for each time the action is to be taken. However, if executed outside a math environment, then the action taken is global, for all following math environments. The definition of `\EMX`:

```
\def\EMX{%
\ifx\@optionONE\@ptsize
  \abovedisplayskip 24pt plus 3pt minus 7pt
\else
  \abovedisplayskip 22pt plus 2pt minus 5pt
\fi
\belowdisplayskip \abovedisplayskip
\abovedisplayshortskip  \abovedisplayskip
\belowdisplayshortskip  \belowdisplayskip
}
```

Micrometer adjustment of the display spacing after a short line can be done by replacing `\abovedisplayskip` in the above definition by a percentage, e.g., `0.9\abovedisplayskip`.

Fixing errors in sectional titles. Long titles for all sectional commands except `part`, `chapter` and `paragraph` produce an error message if the title exceeds the width limit:

```
Title Error:  (62.04767pt too wide)
Page 1, Title="Second section:  consequences of the first section"
```

This can be turned off by `\noisyfalse`. Titles are checked for dimension `\mainheadingwidth` less half an inch for the section number. The maximum title size is 4.5in including the numbering. A little more space (4.8 or 4.9) can be used for a particular title in order to make it look good.

Part and Chapter titles are set in a box of width defined by the control `\mainheadingwidth`. Error messages are automatically emitted for exceeding the box width. The setting of `\noisyfalse` does not affect these error messages.

Long title problems can be fixed individually. To produce 5pt more vertical space on the second line of a long title, the line break can be coded `\protect\\[5pt]`. All line breaks should be coded `\protect\\` and not simply as `\\`. It is good practice to define a control `\def\BR{\protect\\}` and then use `\BR` in all titles to insert a break.

Note in particular that the section titles which are multiline, create a problem in that you may have a pagebreak occur in the middle of two lines. This problem does not occur with chapter titles, as each chapter begins on a new page. `\fourlevels` is the default for the `fsuthesis.cls` and chapters are centered, sections are centered vertically, and subsections and beyond are bold, and not indented.

Fixing errors in the table of contents. Table of contents entries sometimes have to be supplied with breaks and separate entries for the TOC and the title in the text. Normally, the TOC is set with entries up to 4.5in wide, with breaks supplied by LaTeX. I recommend doing this at your own risk, and the best solution is to keep all chapter and section titles brief. For example:

```
\chapter[The Longest Day of the War]
        {The Longest Day \protect\\ of the War}
```

The errors in title lengths for table of content entries are emitted by LaTeX during the input of the `toc` file. These are *serious messages* which direct you to fix the `toc` entry that originates from a sectioning command. For example, the LaTeX error message

```
[5] (thesis.toc
Overfull \hbox (6.62102pt too wide) in paragraph at lines 16--16
 \twlrm sec-tion, first sub-sub-sub-sec-tion, first para-graph:
)
```

means that some sectioning command title had a bad break in the TOC. Furthermore, the bad break was on the word `paragraph`. Insert a manual break to get it right. Find the title in the source and do something like this (`\BR` is defined by `\def\BR{\protect\\}`):

```
\paragraph[Third section, third subsection, first subsubsection,
first subsubsubsection, first \BR paragraph: must be a sentence.]
{Third section, third subsection, first subsubsection, first
subsubsubsection, first paragraph: must be a sentence.}
```

`\doublespacedheadings` The thesis format provides every other line to be blank throughout the thesis. Chapter titles are included, they must have every other line blank. Titles of sections, subsections and subsubsections must have a single style. The *first style* is every other line blank (double-spaced titles). It is an option that can be specifically selected with the above control sequence.

`\singlespacedheadings` The *second style* is text on every line and no interleaved blank lines (single-spaced titles). This is used only for the `subsection`, `subsubsection`, `subsubsubsection` commands. The others remain the same as in the `doublespacedheadings` format. This option is the default as a result of consultation with the thesis office (1999).

`\fixchapterheading` The space after a main heading is too large if a chapter command is followed by a section command with no text between. Use `\fixchapterheading` to remove the extra space. Place this command after the `chapter` command and before the `section` command. This command applies also to an appendix section that directly follows an appendix heading (chapter followed by section in an appendix). The default definitions for single and double spaced headings:

```
\def\fixchapterheading{\vspace{-24pt}}
\def\fixchapterheading{\vspace{-19pt}}
```

6 Main Text

The chapters are to follow the above special page-generating commands, but to set the counters correctly, the command

```
\maintext
```

must precede the `\include{...}` or `\input{...}` commands for the chapters.

The spacing after a chapter command is considered to be a critical parameter by the thesis editor. A thesis should be coded in LaTeX as follows:

```
\chapter{Preliminaries}
\fixchapterheading            % Used when no text appears
\section{Introduction}
```

There is no way to predict the contents of the first line of text following a chapter command. It could be a sectional command or it could be a paragraph of text.

If you want a draft without the front matter pages, then comment out the front matter command or commands, and leave just the command `\maintext` instead. The draft will begin unceremoniously with the first page of the first chapter. It will still include all the back matter. If your thesis has a `part` command, then it should follow `maintext` so that the page numbering begins correctly (PART I is on page 1). The use of "Part" is rare at FSU, the first level of heading being "Chapter".

Each chapter (or part) should be in its own file, and included into the thesis using the LaTeX command `\include`. The command `\input` may also be used, but it is more suitable for direct textual inclusion, while `\include` has some additional capabilities that are useful while working on drafts. In particular, the `\includeonly` command is very useful to restrict processing to selected `\include` files—important when the whole thesis may take 30 minutes to format! A disadvantage of the `\include{...}` command is that each use clears the page. If the chapters are broken due to length problems, then extra white space may appear (so break on section or chapter headings only).

Part and chapter headings are defined by the thesis format and never change, but the exact format of section headings depends on how many levels of subheading you use. Since it would be pretty hard to decide by looking directly at the text, you will need a command `\fourlevels` (the default) or `\fivelevels` in the preamble (before the `begin{document}`).

7 Font sizes and styles for sectional commands

Section headings can be `part`, `chapter`, `section`, `subsection`, `subsubsection`, `subsubsubsection` or `paragraph`.

The `part` and `chapter` headings are the largest fonts used. The format of these headings is: maximum 4.5 inches wide, centered, every other line blank. The default size is 4.25in, changed with the control `\mainheadingwidth`.

The test for blank line height is made by placing two duplicate pages together in registration back lit by a strong light source. The two pages together must make a full page of text without collision of characters from adjacent lines. This test implies that blank line height depends upon the font height of adjacent lines, generally measured by uppercase `M`. This format is called *double-spaced*. Normal LaTeX spacing is called *single-spaced*.

The sectional commands `part` and `chapter` are always produce a double-spaced heading.

The commands `section`, `subsection`, `subsubsection` and `subsubsubsection` may be all single-spaced or all double-spaced (but not mixed). See the command `\doublespacedheadings` to select the non-default style.

The `section` command produce a number which is part of the first centered title line. Additional lines are also centered. Specific line breaks must be supplied by the author to achieve inverted pyramid format. Bear in mind that these line breaks appear in the TOC as well.

In `threelevels`, the `subsection` commands produces a number in its own box and the title is set in the selected font in a paragraph of width 4.25 inches. It is up to the author to set specific line breaks so that the title is left-justified and forms an inverted pyramid on the right (maximum width is 5in).

In `fourlevels`, the `subsection` is centered like `section`. The `subsubsection` appears as outlined above for the `subsection` control in `threelevels`.

In `fivelevels`, the `section` and `subsection` are centered. The `subsubsection` and `subsubsubsection` are essentially the same, with `subsubsection` being the same as `threelevels`.

In `threelevels`, `fourlevels` and `fivelevels`, the command `paragraph` produces a boldface sentence at the start of a paragraph. The text should always end in a period and form a sentence. A number is generated at the beginning of the line. The paragraph always appears in double-spaced text. Generally the first sentence should be less than 4.5in long (it will appear in the TOC).

A sectional command must be followed by two lines of text. That means a sectional command cannot end a page and clearly it should not split on a page boundary. There is no fsuthesis intervention on placement, it is up to the author. The placement can be forced by writing `\vbox{...}` around the sectional command and the paragraph that follows. This is a particular source of difficulty noted by the author of this style guide — it is currently possible to have section and chapter titles break across a page — and this is something that must be controlled by the author, using a specific `\newpage` command. Hopefully further work on this style file will result in a more secure method of controlling the placement and page-breaking algorithm with regard to chapters and section titles.

The following scheme is used for assignment of font sizes and styles for double-spaced titles in sectional commands.

Command	Font size and style	Details
`part`	`\HFpart\bf`	uppercase title, inverted pyramid, doublespaced. Use whole page, centered horizontally and vertically.
`chapter`	`\HFchapter\bf`	Centered uppercase title in 4.25in box, single-spaced, inverted pyramid. Box can be up to 4.5in wide. Chapters are expected to start a page. (Note: Special characters must be handled using instructions inside the `.cls` file.)
`section`	`\HFsection\bf`	Centered, dual-case title, doublespaced. Inverted pyramid up to 4.5in wide.
`subsection`	`\HFsubsection\bf`	Dual-case title, doublespaced, left-justified.
`subsubsection`	`\HFsubsubsection\bf`	Left justified, dual-case title. The subsubsection number uses 7 characters and the title is a doublespaced paragraph left-justified 10 characters from the edge. The number is separated from the title by 2 spaces. One blank line follows the title.
`subsubsubsection`	`\HFsubsubsubsection\bf`	Left justified, dual-case title. The subsubsubsection number uses 9 characters and the title is a doublespaced paragraph left-justified 13 characters from the edge. The number is separated from the title by 2 spaces. One blank line follows the title. (Not recommended)
`paragraph`	`\HFparagraph\bf`	Standard paragraph indent, dual-case title. The paragraph number uses 9 characters. After 2 spaces the title is run into the doublespaced paragraph. Without the paragraph number this amounts to bold-facing the title at the start of a paragraph.

The 12pt font sizes are listed below. All titles are set in bold-face style. The sizes and styles can be changed with special permission from the thesis office.

`\HFmainhead`	Uppercase `\large`
`\HFpartHT`	Uppercase `\large`
`\HFchapterHT`	Uppercase `\large`
`\HFsectionHT`	Mixed case `\large`
`\HFsubsectionHT`	Mixed case `\normalsize`
`\HFsubsubsectionHT`	Mixed case `\normalsize`
`\HFsubsubsubsectionHT`	Mixed case `\normalsize`
`\HFparagraphHT`	Mixed case `\normalsize`

The baseline skips for double-spaced headings are invoked by the control `\doublespacedheadings`:

```
\def\HFmainheadHT{24pt}
\def\HFpartHT{24pt}
\def\HFchapterHT{24pt}
\def\HFsectionHT{20pt}
```

```
\def\HFsubsectionHT{20pt}
\def\HFsubsubsectionHT{20pt}
\def\HFsubsubsubsectionHT{20pt}
\def\HFparagraphHT{14.5pt}
```

For 12pt single-spaced headings, the current *default*, the following changes are made by the control sequence `\singlespacedheadings`:

```
\def\HFsectionHT{15.5pt}
\def\HFsubsectionHT{13.5pt}
\def\HFsubsubsectionHT{13.5pt}
\def\HFsubsubsubsectionHT{13.5pt}
```

A typical sectional font definition is as follows:
`\def\HFchapter{\@setsize\HFchapter{\HFchapterHT}\xivpt\@xivpt}`
This command defines `HFchapter` as a heading font size using 14pt pre-loaded LaTeX fonts. For example, `\HTchapter\bf` is used by the `\chapter` command to switch fonts for a chapter heading.

If you want something other than the two defaults supplied in fsuthesis, then it is up to you to learn about the sectioning commands and the above font definitions. Install changes in your own private file called `thesis.sty` by copying the appropriate code from fsuthesis.sty and entering the modifications. The file `thesis.sty` is read *after* the file `fsuthesis.sty` and hence new definitions replace the standard definitions. Simple changes like `\bf` to `\rm` should be easy. For font size changes, be prepared to show sample output and be able to justify why your thesis should be different.

8 Back Matter

The back matter of a thesis consists of the pages that follow the chapters. These pages consist of one or more appendices, a bibliography, perhaps an index, glossary, and vita.

Appendices. The control `\appendix` applies in the usual way, as documented in the LaTeX manual. To get the formatting right for the number of appendices, set the variable `\numberofappendices=n`, where `n` can range from 0 up to any value. The style of the table of contents and the chapter headings will be different for 1 appendix than for 2 appendices.

Appendices can have sections and subsections. These will not appear in the table of contents.

```
\numberofappendices=2          % "Appendices" appears in TOC
\appendix                      % Switch into appendix mode
\chapter{Fortran code}         % appendix "A.1 Fortran code" in TOC
\fixchapterheading             % Fix spacing
\section{Common variables}     % Not written to TOC.
\section{Subroutine init}      % Not in TOC
\chapter{Numerics}             % appendix "A.2 Numerics" in TOC
```

The lower order sectional commands like `section` will not generate entries in the TOC. Larger subheadings in the appendix that need no TOC entry can use `\chapter*{...}`.

To make the controls complete, there is `\noappendix` to shut off the appendix mechanism and start chapters again where the numbering left off. The control records how to shut off the appendix mechanism, in case that documentation is required. This could become necessary for a thesis that has several parts, because the appendices in that case have a slightly different structure.

Note: In Spring semester 2003, requirements were changed with regard to the output of the appendices in the Table of Contents and toward this end, a "kludge" was devised The following must be done inside the appendix file in order to get the correct listing in the Contents page:

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\addtocontents{toc}{\SkipTocEntry}
\chapter{This is the First Appendix\label{appendixA}}
\addtocontents{toc}{\protect\contentsline{chapter}%
  {\protect\thesisTOC{APPENDIX~\thechapter:\enspace}{This is the text
  of the  First Appendix}}%
  {\thepage}}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

and the following command was added to the `fsuthesis.cls` file:

```
\DeclareRobustCommand{\SkipTocEntry}[4]{}
```

and until the revised class file is complete, this "kludge" will remain in effect.

Bibliographies. There are at least two ways to do bibliographies — manually, or using BibTEX. The latter is a far superior alternative, especially if you intend to use the same references in several places (such as the papers you're going to extract from the thesis). Another advantage of BibTEX is that it will format the entries according to a predefined style declared by the command `\bibliographystyle`.

There are databases of bibliographic data available online. One such valuable site is Nelson H.F. Beebe's Bibliographies Page, located at `http://www.math.utah.edu/~beebe/bibliographies.html`. Most of these are in BibTEX format.

Many bibliography styles have been defined. Computer Science people should use the `acm` style, which follows the ACM journal style. There is no universal style file for mathematics theses. A number of mathematics theses have used the `plain` and `SIAM` styles. Several Computer Science theses have successfully used the ACM style file. The ACM style uses lowercase article titles. Proper names are protected by using braces in the title.

`\rawbibliographytrue`
This control defines the bibliography environment suitable for placing references after a section title. The section used is the last of a chapter and each chapter collects its own set of references, appearing in a numbered section, which also appears in the Table of Contents. Place this control in the preamble of the LATEX document to enable the feature. When enabled, the `bibliography` environment only creates a list of references, no headers or table of contents entries are generated (the section heading does this already).

`\rawbibliographyfalse`
This control defines the bibliography environment suitable for placing references at the end of the thesis (the default). The Table of Contents has the word "REFERENCES". The references appear on a new page with 2-inch main heading. This is the default. The control can be used many times within the thesis to control the output of a page of references.

Index. The thesis format allows for an index. Its format is basically the same as the standard LATEX behavior. This subject is not specifically covered in the *Guidelines* from the graduate office.

An index is a separate LATEX source file which produces a typical index with page references, not different from an index found in a textbook. The LATEX source for the index might reside in a file `thesis.ind`. The index is inserted into the thesis root file by the following code (the end of the root file):

```
\input{thesis.ind}
```

One mystery is how to select the items to index. A second mystery is how to automate the matching of the page numbers to insure that the index is always correct. The mysteries are solved below.

Support within LaTeX for an index is restricted to *earmarking words and phrases* for output to a low-level file with extension `idx`. For example, `thesis.idx` is made from root file `thesis.tex` by placing `\makeindex` in the preamble and running LaTeX. The file `thesis.idx` contains all the earmarked words and phrases plus their page number in the text. This is a major service, because it solves the problem of matching page numbers to index items. It also insures that page number references to the index are correct. Unfortunately, the contents of `thesis.idx` are unsuitable for use as an index *directly*, because the list is unsorted and unformatted.

> Words and phrases are earmarked in the document using the control `\index{#1}`. We recommend using a control `\X{#1}` defined by
>
> `\def\X#1{{#1}\index{{#1}}}`
>
> because it is easier to tag the words and phrases. The `\index{...}` command produces itself no text in the document, only in the `idx` file. Actual entries in the `idx` file depend upon definitions of `\item`, `\subitem` and `\subsubitem` given in `fsuthesis.sty`.
>
> The low-level `thesis.idx` source file is as primitive as an `aux` file. It is made by inserting the control `\makeindex` into the preamble (and only there) of the TeX document.

The second mystery, that of sorting and formatting the index, will now be discussed. The creation of the sorted and formatted `thesis.ind` from the LaTeX low-level file `thesis.idx` is done in a terminal window outside of LaTeX (and also outside of `emacs`). We run a special unix command `makeindex` or `makeidx` to create the source `thesis.ind` from `thesis.idx`. The syntax for the command is given in a manual page: `man makeindex`. The 1993 version runs like this:

```
makeindex thesis.idx
```

It produces `thesis.ind` which is the sorted and formatted version of the index.

The formatting of the index itself for fsuthesis style is two-column newspaper format with header **Index** and normal numbering. If you are going to insert an index, it must be before the *biosketch* and after the *appendices*. Because of numbering problems it may be necessary to turn off the appendix switch with `\noappendix`.

The special separate executable system program called `makeindex` or `makeidx` exists on all systems which support TeX, including microcomputers.

Biographical Sketch. The Biographical Sketch is required, but the absolute last thing in the thesis. It is set up by the `\biosketch` command, which starts a new page and titles it. The text for your biographical sketch is to immediately follow the `\vita` command. It must follow LaTeX rules, but it is otherwise totally up to you. The Thesis *Guidelines* makes some suggestions.

9 Figure and Table Placement

There is deep problem with figures and tables. They trouble most persons who use LaTeX. The placement seems sometimes out of control, with the figure or table ending up on the wrong page. The purpose of this section is to discuss how to adjust the placement and tweak various parameters to make everything happen according to plan.

The thesis format dictates that figures *should be placed so they look balanced on the page.* Defined limits: If text appears, then it makes a block of six or more lines mid-page. Pages of floats are not constrained. Figures and tables are separated by triple spacing (2ex). The counting of figures and tables refers to large boxes that take the full text width. A figure that itself consists of three small horizontally placed graphs is considered one figure.

The basic setup for figures and tables is to define them as floating boxes of text that take up the full text width. As such, a box can be placed at the top `[t]`, at the bottom `[b]` or in the middle of the page `[h]`. Figures and tables can appear by themselves on a page of floats. This is a page on which no text appears. The option `[p]` selects this placement. A chapter can end with a figure. If too little of the page is used it may look better placed with `[h]` option as the last item on the page.

Further, a figure must appear *after* it is referenced, that is, the figure is physically below the reference, and no later than the next page, or the one after that, in case there is a page of floats generated.

The figure and table counters are reset in each chapter. Figure and table numbers look like `2.5`, where `2` is the chapter number and `5` is the figure number in that chapter. The figure captions use **Figure 2.5** followed by the **Title** which is in the normal Roman 12pt font. The numbers and titles are inserted by the `\caption` control using a special syntax (`\label{name}`) to generate cross reference labels. If the `caption` control is not used, then no counters are incremented and all labeling and numbering is up to you.

```
\newcounter{figure}[chapter]                    figure counter
\def\fps@figure{tbp}                            Default placement [tbp]
\def\thefigure{\thechapter.\@arabic\c@figure}   Number is "2.5"
\def\fnum@figure{\bf Figure \thefigure}         Label is "Figure 2.5"

\newcounter{table}[chapter]                     table counter
\def\fps@table{tbp}                             Default placement [tbp]
\def\thetable{\thechapter.\@arabic\c@table}     Number is "2.5"
\def\fnum@table{\bf Table \thetable}            Label is "Table 2.5"
```

For example, if you don't like the bold label, then insert this into your private `thesis.sty`:

```
\def\fnum@figure{Figure \thefigure}         Label is "Figure 2.5"
\def\fnum@table{Table \thetable}            Label is "Table 2.5"
```

Placement of figures and tables. It is recommended that you use initially use *no* options (i.e., `[tbp]`) until you run your thesis, because the float parameters have been set such that optimal placement can occur without them. Only in instances where you have many floats (table and figure) close together, will problems arise. Such a situation may require the use of `[tbp]` or physically moving the placement of the figure up in the text. The reason for this is that all figures and tables are placed on a "stack" of floats, and removed, in order and by size. Rarely, but occasionally, you may see figure 7 (vertical size of 3 inches) appear before figure 6 (vertical size of 6 inches) - simply because there is enough space on page n to place figure 7, but not figure 6. Again, this situation is quite rare. To understand the full effect requires a deep knowledge of the float algorithm in `latex.tex`. Suffice it to say that the parameters below, set as indicated, cause the figures to be dumped in a predictable way. Still, it may not produce what you want, and hence you have license to change them locally mid-document to handle a particular positioning problem. *Exercise great caution* in changing these parameters. After they produce the desired change, *reset them to the defaults below.*

```
\def\topfraction{.9}         % Fraction of page may be used for top floats
\def\bottomfraction{.5}      % Fraction of page may be used for bottom floats
```

```
\def\textfraction{.2}        % Fraction of page which must be filled with text
\def\floatpagefraction{.8}   % Smallest fraction of page to be filled with
                             %   floats before a new page is called
```

The maximum number of figures on a page is controlled by some variables that you will likely never have to reset. Option `[t]` and option `[b]` can be used together to generate 20 figures on one page. The thesis office has no rule about the number of figures per page. Manual intervention is required. The variables and default values (don't change):

```
\setcounter{topnumber}{10}      % Option [t] can place 10 figures max
\setcounter{bottomnumber}{10}   % Option [b] can place 10 figures max
\setcounter{totalnumber}{20}    % Up to 20 figures per page
```

The distance between figures and text and tables is set by a number of glue variables. It is possible to change them locally within the thesis to solve fitting problems with figures and tables. Always reset the values after use!

```
\floatsep 14pt plus 2pt minus 4pt      % vertical space between floats
\textfloatsep 14pt plus 2pt minus 4pt  % vertical space between text and floats
\intextsep 2em plus 4pt minus 4pt      % vertical space around mid-page float
```

Figure captions. Captions for tables and figures are centered in the current text width (the default). A figure caption is *below* the figure. A table caption is *above* the table. The captions are to be consistent and follow a recognized style guide. Rules for tables are different than rules for figures. See your style guide or find journal samples that support your style.

The captions in figures may be of a different style than found in style manuals such as the *ACS Manual* or the *Chicago Manual*. In this style, the caption is a paragraph set in block format across the text width. The title can be set in boldface font, followed by a paragraph of table notes.

The *Journal of Computational Physics*, Vol 108, No 1, September 1993, p 173, shows a non-pyramid form table with a paragraph of text instead of a short title. The *SIAM Journal of Scientific Computing* shows similar formats for tables in the July 1993 issue, Vol 14, pages 930-931. The *SIAM Journal of Numerical Analysis* Volume 30, No 3, June, 1993, page 625, shows very long table captions in block format.

A common style borrowed from many style manuals is in use by journals such as *Applied Numerical Mathematics*, *Journal of Combinatorial Theory*, *Journal of Number theory* and *Journal of Multivariate Analysis*. In this style, the title is above the table in a centered inverted pyramid format. The title is brief. If notes about the table are needed, then they appear below the table in a text paragraph or else in the main text near the reference to the figure.

The control

`\captionstyleparagraph`

sets the caption in a text width paragraph. The size can be changed with a `parbox` construct or a `minipage` environment wrapped around the caption.

The control

`\captionstylecentered`

sets the caption in a centering environment using the current text width. Again, the width can be changed by `parbox` and `minipage` constructions.

The text below a table, or table notes, as they are sometimes called, is set in a text width paragraph. This takes no special command inside a `table` environment, except possibly a `\par` command to insert space after the last line of the table. In particular, this text is *not* defined by a `caption` command!

The title used in a caption must also appear in the **List of Tables** or the **List of Figures** with the same words. The breaking of long titles will be different in the *List.* Caption placement is *below* the figure and *above* the table.

The controls `captionONtrue` and `captionONfalse` turn on and off, respectively, incrementing of counters and list of tables of list of figures entries, for usage of the `caption` macro. The best use of this feature is to create a continuation table on the next page which has the same table number and title *Continued.* All the features of LaTeX floats are available to place the table on the next page. It is recommended for multi-page tables, that you use the `longtable.sty` package, which automatically breaks tables over pages and supplies the continuation table heads and continuation lines.

A figure caption may be a paragraph of text describing the table. The caption is expected to be in paragraph format or else in centered inverted pyramid format. Titles wider than the text width are unacceptable. The entry in the list of figures is expected to be in a different format, namely a plain text paragraph, and one line is best.

A table caption is usually not a paragraph, but in certain styles that also is possible. In paragraph style, the first sentence is kept short so it can be the same in the *List.* Explanation of the table is to appear *below* the table in a text width paragraph, or in the main text, or if you use the style of the *SIAM Journal of Numerical Analysis*, as a paragraph or less continuing the title. The keynote here is consistency: don't mix styles, use one style. Exceptions to this rule for tables are an agreement between the thesis office, the student and the thesis advisor. A style guide is the best way to procure agreement.

An example follows showing how to control the effects for a table of unspecified width of about 3in having a two-line title that is to be set in centered inverted pyramid format (ACS style). The attempt here is to constrain all formatting to the table width. It is more common to use the entire text width for the table with horizontal line across the page following the table. If that style is preferred, then replace `\TMPsize` by `\textwidth` in the example (so that footnotes appear below the table).

In this example, *Table 2.15. Principal Coordinates for the Fundamental Dynamical System* will appear in the list of tables, while an inverted pyramid title will appear above the table, as follows:

Figure 2.15. Principal Coordinates for the
Fundamental Dynamical System

x	0.00	0.25	0.50	0.75	1.00	1.50	2.00
y	1.10	1.08	1.00	0.86	0.66	0.35	0.27

The value x is the position coordinate.
The value y is the velocity coordinate.

```
\captionstylecentered
\def\TMP{\begin{tabular}{|c|c|c|c|c|c|c|c|} \hline
 $x$ & 0.00 & 0.25 & 0.50 & 0.75 & 1.00 & 1.50 & 2.00 \\ \hline
 $y$ & 1.10 & 1.08 & 1.00 & 0.86 & 0.66 & 0.35 & 0.27 \\ \hline
\end{tabular}}
\newdimen\TMPsize\settowidth{\TMPsize}{\TMP}

\begin{table}[b]
\begin{center}
\begin{minipage}{\TMPsize}
```

```
\caption{Principal Coordinates for the \protect\\ Fundamental
Dynamical System}
\TMP\medskip
\par\rule{\hsize}{1pt}\par
\leftline{\footnotesize The value $x$ is the position coordinate.}
\leftline{\footnotesize The value $y$ is the velocity coordinate.}
\end{minipage}
\end{center}
\end{table}
```

The **minipage** construct is used to restrain the footnote width and the caption width to the table width. The full text width is used by default for the caption. Explicit line breaks were needed to produce an inverse pyramid.

The best style uses the caption macro with a short title so that no engineering needs to take place in the list of tables.

Check list for figures and tables

1. A figure must follow its reference, at the bottom of the current page or immediately on the top of the next page. Start with no options, and then use `[b]` and change to `[t]` if it doesn't fit.

2. An option of `[t]`, which causes proper figure placement after the reference on the preceding page, can be followed by a figure with [`[b]` option. Both figures can be used on the same page. Warning: Three usually won't fit and still have lines of text mid-page.

3. A `\clearpage` command is sometimes needed to empty pages of floats before the next paragraph is read. The required `\clearpage` is inserted after the final figure. Use with caution, and on the final run only.

   If a good portion of the last page is blank, then the final page might look better with a ragged lower edge, which can be obtained by using `[h]` instead of `[b]`. The thesis office endorses this exception to the mid-page figure rule.

4. Expect the thesis editor to move the figures and tables around to make the document look balanced. Expect that you will move figures also, as more text is added or subtracted. The flux ends when the thesis is approved and the final copies are delivered. A healthy attitude of expected change is more useful than an attitude of permanent location.

5. Check all figure pages for rule violations: caption, and numbering. The style must be consistent: a violation is inverted pyramid title on one table and paragraph format title on another.

10 Making Figures

There are a number of methods for creating diagrams and figures for use in a LaTeX document. The choice of method depends upon the type of figure and the method of generation.

Photographs. If these are to be inserted into a thesis, then the photos must be approved well in advance of publication by the thesis office. There are copyright restrictions that may apply, which could prevent acceptance of the thesis. Be sure and read the copyright information in the *Guidelines*.

Paste-up Figures. The need for this is rare because of the wide availability of scanners which can create `ps` files. Figures can be pasted up to make the final copy of a thesis. Still, it is handy to have LaTeX decide the figure positions, numbering and captions. Simply use the following construct for those figures which you cannot process within LaTeX.

```
\begin{figure}
\vspace{5in}    % example vertical size of figure
\caption{Something to describe the figure}
\end{figure}
```

Postscript Figures. It is possible to directly insert Postscript figures into LaTeX documents. Many microcomputer programs produce Postscript output and therefore it may be an advantage to insert this type of figure directly. Some unix programs which can create the postscript images: `gnuplot, xfig, idraw, freehand, matlab, xmath, maple` and `mathematica`.

Many theses in mathematics have successfully used PostScript figure insertions. If there is a standard, then possibly it is PostScript. This standard is not without problems. The biggest trouble is the size of labels and the pen size for plotting. Letters have to be 2mm high to pass the microfilm test (less than 2mm will vanish on the microfilm). The xerox test is applied to the pen size: it must not lighten or vanish upon being Xeroxed. If your figures are PostScript, then choose a large point size for the fonts to insure that reduction leaves the letters 2mm high. For example, 14pt `\large` fonts reduced 50% become 7pt fonts, which is almost exactly 2mm high. Recommended is the use of `xfig` to add labels in LaTeX mode. It is important to keep consistent fonts and font size, but PS fonts are from the outset inconsistent with all the LaTeX fonts.

11 More Features

11.1 Additional Commands

Some additional convenience commands have been defined.

`\begin{epigraph}` *words* `\end{epigraph}`
Creates an epigraph. An epigraph is a quotation or motto at the beginning of a book, a chapter or section. The text will be indented and single-spaced, but the rest of the formatting (such as a blank line between the text and attribution) must be done by hand. Overdoing the number of epigraphs will cause you to be known as an *epigraphist*, one versed in *graffiti*.

`\begin{topics}{template} ... \end{topics}`
This special environment can be used to solve display problems that might otherwise use `tabular` or `array` constructions. It is similar to the `itemize`, `description` and `enumerate` environments which have the special feature of allowing page breaks between items. The definition:

```
\newcommand{\topicslabel}[1]{\mbox{#1}\hfil}
\newenvironment{topics}[1]{
    \begin{list}{}{%
      \let\makelabel\topicslabel
      \settowidth{\labelwidth}{\topicslabel{#1}}
      \setlength{\leftmargin}{1.1\labelwidth}}
}{\end{list}}
```

The special feature of the `topics` environment is seen in the example below. The alignment of items cannot be done in the usual list environments. But the new feature has a price: the longest item must be entered as a template at the start of the environment (similar to the `tabbing` environment). The template has a natural length that is used as the item width (see the above definition) and therefore custom widths can be designed for the item column which will persist and be uniform from page to page. The `\item[...]` is never optional: the square brackets must occur even if no text is to be entered!

```
\begin{topics}
      {\bf Crocodiles and Reptiles.}
\item[\bf How X works:]
   \begin{topics}{\sf Windows.}
   \item[\sf Windows.]
        Usually made of glass but
        X-windows are an exception.
   \item[\sf Errors.]
        They appear in the console
        window from time to time.
   \item[\sf Exit.]
        For the twm manager, exit
        by pull-down menu option.
   \end{topics}
 \item[\bf Alligators.]
      In many places in the world
      there can be found
      crocodiles and alligators.
 \item[\bf Crocodiles and Reptiles.]
      Besides crocodiles and alligators
      there are brown and green lizards.
\end{topics}
```

How X works:

- Windows. Usually made of glass but X-windows are an exception.
- Errors. They appear in the console window from time to time.
- Exit. For the twm manager, exit by pull-down menu option.

Alligators. In many places in the world there can be found crocodiles and alligators.

Crocodiles and Reptiles. Besides the crocodiles and alligators there are brown and green lizards.

`\noisytrue`, `\noisyfalse`
Enables and disables the printing of progress messages. This is useful for debugging if front matter is coming out wrong, or if you like programs to give out reassuring patter about what they're up to. The default is `\noisytrue`.

`\begin{singlespace}` *words* `\end{singlespace}`
This environment allows single-spaced text to be inserted into the thesis at any point. Use it with caution: the manual is very specific about double-spaced text, which is the default in this style. A warning: a control `\par` is required before invoking single spacing and directly after as well. This can also be done by blank lines. Most complaints about single spacing can be resolved by inserting blank lines before and and the environment.

```
\singlespace
\doublespace
\normalspace
```

In some circumstances, the singlespacing environment may not work. It usually requires a `\par` control before it is used and immediately after before changing to other spacing. Each of these commands changes the inter-line spacing for everything up to the next space-setting command. `\singlespace` and `\doublespace` do the obvious things, while `\normalspace` sets to the default spacing (double for theses, single for technical reports). For this reason, `\normalspace` is preferable to `\doublespace`, when you only want to go back to the usual spacing.

`\theoremsetup`
This setup control defines theorem-type environments `theorem`, `proposition` and `corollary` in a default manner. Put the control into the preamble of the document if you wish to enable the feature. Remove the reference to disable the loading of these default definitions. Warning: once defined, there is no convenient way to erase the definitions.

The reason for the control `\theoremsetup`, clumsy as it seems, is to allow for custom definitions of `theorem`, `proposition`, `corollary`. The `\newtheorem` feature disallows a definition to be turned off or re-defined. A common tweak of the theorem environment is to insert Roman text in place of italics into the theorem body. Of course, it is desirable to call the result `theorem` and not some other name.

`\begin{theorem}` *words* `\end{theorem}`
This theorem environment follows the suggestion in the LaTeX manual. It defines a new counter called `theorem` which is reset in each section and incremented upon each use of the environment. See the control `\theoremsetup` above to enable this environment. New environments can be made from a base theorem environment:

`\newenvironment{Theorem}{\begin{theorem}\rm}{\end{theorem}}`
This environment, used in place of `theorem`, has all the features of the theorem environment but sets the text body in Roman. The `Theorem` environment is *not defined* in the fsuuthesis style — it is a customization to be coded into the preamble.

`\begin{proposition}` *words* `\end{proposition}`
Like the `theorem` environment, this pre-defined environment follows the standard use of propositions and theorems, with the text of the proposition set in italics. The counter used is the `theorem` counter: there is no separate counter for propositions. See `\theoremsetup` above to enable this environment.

`\begin{corollary}` *words* `\end{corollary}`
Like the `theorem` environment, text is set in italics. The same counter is used: `theorem`. See the control `\theoremsetup` above to enable this environment.
Other inventions commonly used for a thesis can be included in the preamble of the document. Here are some normal definitions, which should be self-explanatory. Please observe that the items below are **not pre-defined**! To make them useful, enter them into the preamble of the LaTeX document.

```
\newtheorem{theorem}{Theorem}[chapter]           The common definitions
\newtheorem{proposition}{Proposition}[chapter]   enabled by control
\newtheorem{corollary}[proposition]{Corollary}      \theoremsetup

\newtheorem{lemma}[theorem]{Lemma}
\newtheorem{define}[theorem]{Definition}
\newtheorem{hope}[theorem]{Conjecture}
\newtheorem{example}[theorem]{Example}
\newtheorem{obs}[theorem]{Observation}

\newtheorem{lemma}{Lemma}[section]
\newtheorem{co}[lemma]{Corollary}
\newtheorem{df}[lemma]{Definition}
\newtheorem{example}[lemma]{Example}
\newtheorem{question}[lemma]{Open Question}
\newtheorem{remark}[lemma]{Remark}
\newtheorem{th}[lemma]{Theorem}

\renewcommand{\thelemma}{\arabic{section}.\arabic{lemma}}
\renewcommand{\theequation}{\arabic{section}.\arabic{equation}}
```

The font used for these environments is by default italic. If you want a normal roman font, then new environments must be defined — see the LaTeX manual for details.

Use the subeqn] package for numbering equations in the form, e.g., (1a), (1b). The usage would be:

$$a + b = c \tag{1a}$$

$$a + B_n \times A_y = C \tag{1b}$$

The code for the above is as follows:

```
   \begin{subequations}
     \label{eqone}
      \begin{equation}
          a + b = c\label{onea}
      \end{equation}
      \begin{equation}
          a +  B_n \times A_y = C \label{oneb}
      \end{equation}
   \end{subequations}
the above equations are referenced by the label (\ref{eqone})
as a whole, or individually as (\ref{onea}) and (\ref{oneb}).
```

The following is a sample code for the subeqnarray package, but cannot be "typeset" as there would be a conflict if both the subeqn and subeqnarray packages were input.

```
    \begin{subeqnarray}
       \label{c}
         X &=& B_x \times A_y\slabel{twoa}\\
         Z &=& \delta_z +\frac{dx}{dt}\slabel{twob}
    \end{subeqnarray}

and may be referred to individually as Eqs.~\ref{twoa} and
\ref{twob} or collectively by Eqn.~\ref{c}.
```

I might add that I prefer the `subeqnarray` package, as it uses `\slabel` for the "sub"labels, and `\label` for the main label.

`\begin{Proof} ... \end{Proof}`

The Proof environment uses normal Roman text, with a trailing black square at the end of the text, supplied automatically by the `\end{Proof}`. The definition:

```
\newcommand{\boxx}{\unskip \nopagebreak \hfill ${\blacksquare}$% }
\newenvironment{Proof}%
    {\noindent{\bf Proof.}\begin{rm}}%
    {\boxx\end{rm}}
```

`\proofline{#1}`

Insert a line of text used to identify a proof. It can be used also to invent a proof environment, which might be more convenient. The definition allows for easy re-definition:

```
\def\proofline#1{\protect\par\noindent{\bf #1}:~}
```

`\proof{#1}`

Inserts a proof line of the form "**Proof #1**:" which is convenient for items of the form **Proof of Theorem 7:**. The definition allows it to be redefined easily:

```
\def\proof#1{\proofline{Proof #1}}
```

`\pf`

Inserts **Proof:** into the text with no indent. This is a common way of marking proofs. The definition:

```
\def\pf{\protect\proofline{Proof}}
```

`\qed`
This control sequence is used to end a proof. It has the following definition in the fsuthesis style:

```
\def\qed{\protect\par\noindent{}$\square$\protect\par}
```

Other possible definitions, placed in the preamble, would be:

```
\def\qed{\nobreak \hfill \rule{1ex}{1em}}
\def\qed{\nobreak\ \mbox{~~\rule{1ex}{1em}}}
```

`\mainheading{#1}`
The two-inch top margins that you see in the thesis are produced by this control sequence. It may be useful in solving some formatting problems. It is best used after an `\eject` or `\clearpage` command, so that the two inches of space is at the top of the page. The argument is the text that you want centered in `\large\bf` print, just below the 2-inch white space. This command actually uses a special font size `\HFmainhead` with baselineskip `\HFmainheadHT`, basically large boldface. The text is set in a box of width `\mainheadingwidth`, normally 4.25in.

`\ulabel{#1}{#2}`
This feature supplies an alternative to the `\label` control sequence. Its purpose is to prefix entries in the AUX file with a string given in the second argument `#2`. An example showing how `ulabel` works:

```
Example:
        \begin{theorem}% Theorem 2.4
        \ulabel{hottheorem}{Theorem}
         The group ${\cal G}$ is simple.
        \end{theorem}
```

Later on, `\ref{hottheorem}` produces string `Theorem 2.4` because `\thetheorem` equals `2.4`. The usual `\label{hottheorem}` supplied by LaTeX would produce only `2.4` in the AUX file and `\ref{hottheorem}` in this case would be `2.4` instead of `Theorem 2.4`.
Greg Conner used this control sequence in 1992 to reference theorems and corollaries. The advantage is that references can be tied to the particular theorem, corollary or lemma by words and number, resulting in a consistent system of references.
The definition:

```
\def\ulabel#1#2{\@bsphack\if@filesw {\let\thepage\relax
   \def\protect{\noexpand\noexpand\noexpand}%
   \xdef\@gtempa{\write\@auxout{\string
   \newlabel{#1}{{#2 \@currentlabel}{\thepage}}}}}\@gtempa
   \if@nobreak \ifvmode\nobreak\fi\fi\fi\@esphack}
```

`\inputpicture`
Jeff McGough used the control `\inputpicture` in November 1992 to input figure files in his thesis. He found that complicated figures slowed the evaluation process considerably and it became convenient to compile the DVI file with *phantom figures* in place of the real ones. The *phantom figure* was a box as seen below made with this LaTeX source:

```
\setlength{\unitlength}{0.0063in}%
\begin{picture}(573,357)(114,408)
\thicklines
\put(114,408){\framebox(573,357){}}
\end{picture}
```

The generation of figures is controlled by

```
\newcommand{\inputpicture}[1]{%
   \ifinputpicture \input{#1} \else \input{box.tex} \fi }
\newif\ifinputpicture \inputpicturetrue
```

where file `box.tex` contains the contents given above.

To use the `\inputpicture` control, enter after the beginning of the document one of these two commands:

```
\inputpicturetrue
\inputpicturefalse
```

To input a picture file `pic.tex` use the following syntax:

```
\inputpicture{pic.tex}
```

The picture will appear in the DVI file if the control sequence `\inputpicturetrue` was set and a box will appear in the DVI file if `\inputpicturefalse` was set.

11.2 Other Documents

The thesis itself is not the only document that you may need to produce. It is useful to have a file `forms.tex` which has all the declarations of the regular thesis, but only generates, say, the committee approval page, so it can be printed on bond paper and signed before the thesis goes through Format Approval.

It may be desirable to use a title page for the abstracts that are submitted separately; `\abstracttitlepage` works just like `\titlepage`, but produces a slightly different output.

Another possibility is for the thesis to be turned into a departmental technical report. The thesis format does not follow the report format, so as mentioned earlier, so the `report` option to the style makes appropriate changes (there are really only a few that need to be made). The most significant change is the use of a different title page, which is generated by the command `\reporttitlepage`.

12 Warnings and Problems

The fsuthesis style will not correct forms of references, spelling mistakes, or poor writing. Proofread everything.

A common complaint is inconsistency of use. An example: in the introduction the terminology **4-dimensional** used is whereas later on it becomes **four-dimensional**. While not a difficulty for American mathematicians, it is definitely a problem for persons whose native language is not English. A thesis is an international document, and therefore the manuscript must pass a consistency test of this nature. It is recommended that you use a control sequence for each piece of special terminology, to insure consistency throughout the document.

Double words are a common defect in theses. These can be eliminated by a unix program `dw` that checks for this situation. Usage is as follows: `dw <file.tex>file.out`. This utility was compiled to work on Dirac (AIX 4.1).

Missing words are another common problem. Careful proofing of text is the only sure cure for such defects.

Placement of punctuation is determined by the style guide. It is to be consistent. Equations at the end of a sentence should end with a period, in general. Commas often appear at the end of a displayed equation. Quotations should be treated as per the style guide: sometimes they get quote marks and sometimes not. Italics and periods are used according to the dictionary: is it 'et al.', '*et al.*', 'et. al.' or '*et. al.*? Hyphenation is used according to the dictionary or a style guide but must be consistent throughout the text.

Overuse of certain words is a common thesis fault that can be reduced by using a dictionary and a word count program. For example, the word **note** or phrase **note that** tend to be used too much. Other pet combinations known to irritate readers are **because** and **since**, essentially the same in mathematics, but not so for persons trained in other disciplines. A thesaurus can be useful for finding other combinations of words that replace the troublesome words.

A spelling program like `ispell` on the Unix systems is a safeguard against simple typographical errors. Other spell programs exist on microcomputer hardware. Most are useful, especially WordPerfect and MS-Word spelling checkers.

The most commonly misused controls are

```
\eject
\newpage
\clearpage
\vspace
\vskip
\hskip
\hspace
\\
\\[2pt]
\mbox{...}
\smallskip
\medskip
\bigskip
```

As a general rule, leave hard space controls out of the document! Use environments and control sequences wherever possible. The `newpage` command creates a document that the thesis office will have to reject: the page heights are to be identical.

Use `\clearpage` only to cause a dump of a page of floats (figures or tables entered with option `[p]`) or to force a figure dump at an important point. This command is a page-filling command, but it can backfire and cause figures and tables to end up on the wrong page.

Avoid using font size `\tiny`. It uses 7pt font size, which is right at the reproduction limit of 2mm for microfilm. Small subscripts in math mode can be increased in size by the use of `\displaystyle`. Commands like

```
\def\dd{\displaystyle}
```

as often seen in the preamble to decrease the typing of math mode equations, especially in the `array` environment, where compressions always seem to appear.

Use of *italics* and bold face LaTeX 2_ε makes use of the `\textit` and `\textbf` convention of changing the font face, as opposed to `{\it ...}` and `\textbf{..}`. The new usage, for italics especially includes the "italic correction" and prevents words from overprinting punctuation or the following word — i.e., I believe you will find the change *worth* it, as opposed to *not worth* it. The same statement is true for the use of `\bf` and `\textbf`.

Error messages. There is a requirement that all section and chapter headings must be less than 4.5 inches long. This requirement has been met for the `uuthesis` style, technically, but you can enter a longer title, and hence explicit line breaks are required to make the title into an inverted pyramid.

The errors in this case show up in the preview but also in error messages during the TeX compile, especially when the TOC is input. Please *don't edit the TOC*! It is recreated every time TeX runs. The place to edit is the sectioning commands deep inside the LaTeX document, where probably no error message is emitted. The fix is to insert an optional argument `[...]`, for example,

```
\section{Main results on normal subgroups}
```

becomes

```
\section[Main results on reduction \protect\\ of normal subgroups]
      {Main results on reduction of normal subgroups}
```

It takes two runs of LaTeX to put the new TOC into the DVI output. On the second run the error given during read of the TOC should vanish.

The control `\def\mainheadingwidth{4.25in}` is standard and you may have to define it as 4.5in or 4.8in to make a particular title into an inverted pyramid. After such exceptions, it is important to set it back to 4.25in prior to typesetting the next title.

The entry in the table of contents may have to be crafted independently of the actual title in order to create line breaks that are acceptable. This is done by the optional argument to a sectioning command:

```
\chapter[Isomorphisms and Polymorphisms Revisited:
      \protect\\A Survey]
     {Isomorphisms and Polymorphisms
      \protect\\ Revisited: A survey}
```

The sectioning commands that take the optional argument in square brackets are `part`, `chapter`, `section`, `subsection`, `subsubsection`, `paragraph`. In addition, most commands that automatically enter data into the table of contents also take a square bracket optional argument, for example, `caption` in the table and figure environments.

The coding of chapter headings followed immediately by a section head is controlled by control

```
\fixchapterheading.
```

If you did not read these remarks above, then do so now.

Captions on figures and tables have been revised several times. Long captions are centered, and the `\protect\\` command can be used in both the TOC and TITLE arguments. Long captions are completely feasible, but explicit line breaks may be required for extra long titles. There are two styles for captions: paragraph and centered.

Default figure/table placement can be wrong. LaTeX tries to put the figure/table on the same page following the reference with option [b]. Use of the [t] option after previewing is usually sufficient to move the figure to the next page, if it didn't fit on the right page to begin with. It helps to have the figure follow the reference as close as possible (i.e., within the paragraph, right after the sentence with the reference). Sometimes `\clearpage` is needed to force a figure onto the right page, especially at the end of a chapter.

It is required by the thesis office that a figure appear **after** it is cited, and never before the citation, even at the top of the present page. So sometimes option [t] doesn't work and it has to be changed to [b] or [p] or [h].

The `figure*` and `table*` environments have been removed, since the format does not support double column printing in the first place.

Double and other spacing in tables may be gotten using `\arraystretch`. Default is for single spacing. Table format does require at least one horizontal line between caption and body; use `\hline`.

This style has been used with a number of different laser printers, including Imagens, Laserwriters, and Laserjets. The different engines used by these printers may cause the margins to differ when printed out on two different printers by as much as 2-3 character widths. This may be corrected by issuing print commands with offsets (if that is possible), or by overriding the default margins.

The signature pages required for theses and dissertations are formatted directly here, although you can get them from the thesis editor. These forms are correct now, but if the format of the signature pages changes, this style will have to be modified, or else you'll have to get the forms from the editor. Correspondence on changes is most appreciated (see below for contacts).

13 Bug fixes and improvements

If you find something broken in the style file, or find a severe limitation, then please send email to one of the names below, so that the changes and fixes get applied to the master files.

14 Author addresses

If you have problems with this format, or suggestions for improvements and features, contact (in this order):

Mimi Burbank   CSIT/FSU, (850)644–2440   mimi@csit.fsu.edu, 2001

15 Acknowledgments

The `fsuthesis` style file has passed through many hands. It seems to have started life both as the standard LaTeX report style file `report.sty` by Leslie Lamport, and as a Stanford thesis format `suthesis.sty`, done by an unknown person at Stanford. It was then adapted to the University of Utah style (`uuthesis2e.cls`) and finally chosen to be the basis for the FSU style guide for LaTeX. Ann E. Durham, of the FSU graduate, was very helpful in approval of the current format. It is our hope that further modifications can be made to the style file, to make the process of writing a thesis or dissertation less tedious for candidates. Over the past few years, more than a few students have also made changes and shared them with me – many are undocumented and transparent to the user.

16 Sample Root Files

The following is a root file for a dissertation which had its origins in the Spring of 1999. It uses separate files for everything:

- the file `front.tex` contains the dedication, abstract, and acknowledgments;
- chapters are listed individually;
- the bibliography.

Note in particular the preamble items versus the control sequences that appear after the start of the document.

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\documentclass{fsuthesis}
\usepackage{contigrefs}
\usepackage[dvips]{graphicx}
\include{mydefs}
\numberofappendices=3
\fourlevels
\title{A MEASUREMENT OF THE $\mathrm{W}$ BOSON MASS}
\author{John Q. Student}
\uauthor{JOHN Q. STUDENT}
\thesistype{dissertation}
\department{Department of Physics}
\headofdept{Kirby W.\ Kemper}
\deptheadtitle{Chairman}
\deanofschool{Donald J. Foss}
\degree{Doctor of Philosophy}
\gradyear{1999}
\dept{Physics}
\majprofa{Martyn J. \ Corden}
\majprofadegree{Ph.D.}
\majprofb{Horst \ Wahl}
\majprofbdegree{Ph.D.}
\outcommmember{Greg \ Riccardi}
\commmembera{Howard Baer}
\commmemberb{Simon Capstick}
%
\semester{Spring}
\college{Arts and Sciences}
\defensedate{FEBRUARY 12, 1999}
%%%%%%%%%%%%%%%  end of preamble %%%%%%%%%%%%%%%%%
\begin{document}
\include{front}
\dedicationtrue
\frontmatterformat
\makefsuabstract
\endfsuabstractpage
\titlepage
\maketitle
%%  the next two lines can be done separately -   The first line is
%%  required by the Graduate Office as a separate piece of paper, but
%%  only the committee page is contained within the electronic
%%  file. This can be done by creating a ‘‘signature.tex’’ file and
%%  doing that page separately.
\makesignaturepage
```

```
\makecommitteepage
\dedicationpage
\prefacesection{Acknowledgements}\acknowledgementtext
\tableofcontents
\listoftables
\listoffigures
\newpage
\abstractsection{ABSTRACT}
%
\maintext
\include{introduction}
\include{theory}
\include{experiment}
\include{computation}
\include{data}
\include{kinematic_fit}
\include{measurement}
\include{systematics}
\include{discussion}
\include{conclusion}
%
\newpage
%
\appendix
\include{appendixMuta}
\include{appendixJacobian}
%%%%%%%%%%%%%%%%%%%%%%% GLOSSARY %%%%%%%%%%%%%%%%%%%%%%%%
\include{appendixGlossary}
%%%%%%%%%%%%%%%%%%%%%%% BIBLIOGRAPHY %%%%%%%%%%%%%%%%%%%%%%%%
\bibliographystyle{prsty}
\begin{thebibliography}{99}
\include{mybib}
\end{thebibliography}
\bibliography{thesis}
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
\include{biosketch}
\end{document}
```