

The isuthesis package

Joe Struss

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Chapter 1

Creating a Thesis

This manual describes how to put together a thesis using the `isuthesis` package and standard thesis template which were both created at Iowa State. It also goes into many of the special features and options that you can use either as part of this package or as part of creating documents with `LATEX`.

A thesis is normally a fairly long document so it is probably not a good idea to put the entire document into one big file because the thesis will then be difficult to both edit and take a long time to compile with `LATEX`. The examples that follow in this manual use a master file system where the master file brings in all the other files that need to be used to create a complete thesis. Using a master file approach, you can break your thesis down into small, manageable parts that are easier to edit and quicker to compile.

This handout starts with a master file template for a simple Master's thesis using the `isuthesis` package, shows some standard thesis options and then expands to look at alternative thesis templates that use the `isuthesis` package. To start with, take a look at the sample Master's thesis and make sure you understand the mechanisms that are being used. When you are comfortable with the concepts being used then browse the rest of this document for additional information and options.

Current and up-to-date `isuthesis` package information, a complete standard `isuthesis` package example template including the current `isuthesis` package itself— as well as some other `LATEX` related links can be found at the unofficial ISU TeX website:

<http://css.ait.iastate.edu/TeX/>

1.1 Master’s Thesis Template

Here is a annotated template for a simple Master’s thesis created to use the isuthesis package:

<code>% Template file for a std. thesis</code>	⇒Comment line.
<code>\documentclass[11pt]{report}</code>	⇒Chooses the document class report.
<code>\usepackage{isuthesis}</code>	⇒Loads in the isuthesis package.
<code>\usepackage[pdftex]{graphicx}</code>	⇒Adds the graphicx package
<code>\usepackage{traditional}</code>	⇒Adds traditional sectional indents
<code>\chaptertitle</code>	⇒Adds “Chapter” in front of chapter numbers
<code>\alternate</code>	⇒Sectional numbering down to subsection
<code>\usepackage{rotating}</code>	⇒Adds rotating package
<code>\usepackage{natbib}</code>	⇒Loads Natural Sciences bib-style
<code>\bibliographystyle{isuapalike}</code>	⇒Uses a local APA-like bib-style
<code>% includeonly{titletoc,chapter1}</code>	⇒Restricts which \include file are loaded.
<code>% usepackage[pdftex]{hyperref}</code>	⇒Adds PDF hypertext linking
<code>\begin{document}</code>	⇒Starts the document.
<code>\DeclareGraphicsExtensions{.jpg,.png}</code>	⇒Automatically adds suffix to graphics
<code>\include{titletoc}</code>	⇒Brings in file titletoc.tex with title page info.
<code>\include{dedication}</code>	⇒Adds optional dedication.tex file
<code>\newpage</code>	⇒Starts a new page.
<code>\tableofcontents</code>	⇒Creates a Table of Contents
<code>\listoftables</code>	⇒Creates a List of Tables
<code>\listoffigures</code>	⇒Creates a List of Figures
<code>% include{acknowl}</code>	Adds an optional Acknowledgements area
<code>% include{abstract}</code>	Adds an optional Abstract area
<code>\pagenumbering{arabic}</code>	⇒Changes to arabic numbering.
<code>\include{chapter1}</code>	⇒Brings in file chapter1.tex.
<code>\include{chapter2}</code>	⇒Brings in file chapter2.tex.
<code>\include{chapter3}</code>	⇒Brings in file chapter3.tex.
<code>\include{chapter4}</code>	⇒Brings in file chapter4.tex.
<code>\include{chapter5}</code>	⇒Brings in file chapter5.tex.
<code>\include{appendix1}</code>	⇒Brings in file appendix1.tex.
<code>\include{appendix2}</code>	⇒Brings in file appendix2.tex.
<code>\include{biblio}</code>	⇒Brings in bibliographic file biblio.tex.
<code>\end{document}</code>	⇒Ends the document.

1.1.1 Notes

Traditional Thesis Style

The current version of the isuthesis package uses a “modern” thesis style in which sectional items begin on the left then indent from there and also under which chapters simply contain a number with nothing in front of them. The supplemental **traditional** isuthesis package along with the `\chaptertitle` isuthesis command return sections to being in the center of the page and add the word “Chapter ” in front of the chapter number. These two supplemental items are “on” by default in the template because it is what the Faculty at Iowa State seem to prefer. You can comment these two lines and the line after `\listoffigures` out to return to a completely “modern” style thesis.

The `\include` and `\includeonly` commands

When \LaTeX finds an `\include` command, it goes out to the current directory and looks for a file entitled `filename.tex` and includes that file in its entirety into the current document at the point of the `\include`. So, in essence, it brings the other file into the master document.

The `\includeonly` command restricts what files are actually brought into the master file for the current run of the thesis. Normally, a person works on one chapter at a time in a thesis; so why run the whole thesis when one can just run a couple of its parts. In the example here, if the % sign was removed from the front of the `\includeonly` line and the file was compiled with $\text{PDF}\LaTeX$, the only files that would be included into the master file would be: `titletoc.tex` and `chapter1.tex`; and $\text{PDF}\LaTeX$ would ignore the other `\include` lines. To then run the whole thesis, one would just put a % in front of the `\includeonly` line again which would cause all the `\include` lines to be included into the master file.

The Hyperref Package

The hyperref package allows one to add PDF bookmarks and hypertext links to a PDF-style thesis. These can be very useful for moving around inside a large PDF document. The isuthesis template uses the following command and options to add the hyperref package:

```
\usepackage[pdftex,hypertexnames=false,linktocpage=true]{hyperref}
```

It is additional suggested that you add the following setup options:

```
\hypersetup{colorlinks=true,linkcolor=blue,anchorcolor=blue,citecolor=blue,
filecolor=blue,urlcolor=blue,bookmarksnumbered=true,pdfview=FitB}
```

One can, of course, alter the setup options to your own tastes, needs or the tastes/needs of your own thesis committee. If you use the hyperref package, you will also probably want to bookmark the Table of Contents and add the `\phantomsection` command after the Table of Contents, List of Tables and List of Figures:

```
%\pdfbookmark[1]{TABLE OF CONTENTS}{table}
\tableofcontents
\addtocontents{toc}{\def\protect\@chapapp{}}
\cleardoublepage
%\phantomsection
\addcontentsline{toc}{chapter}{LIST OF TABLES}
\listoftables
\cleardoublepage
%\phantomsection
\addcontentsline{toc}{chapter}{LIST OF FIGURES}
\listoffigures
```

One can do this by simply removing the % signs on the commands listed above. The `\phantomsection` command is used to make sure that the pdf-bookmarks end up in the right place.

The `\addcontentsline` listed above adds the Table of Contents, List of Tables and List of Figures to the thesis “Table of Contents” itself. This “trick” is added because normally by International TeX Standards front-matter within a document is not allowed to reference itself in its own Table of Contents but the Thesis Office at Iowa State insists on doing it that way.

1.1.2 Options

Choosing a font size/family

On the `\documentclass{report}` line, one can also add options that alter the font type size for the thesis. You can use either the 10pt (default), 11pt or 12pt font set when creating a thesis at Iowa State. For instance, by default the report class uses a 10pt font but the thesis template alters it to be the standard academic 11pt font. If instead you would like to use the slightly smaller 10pt font or the slightly larger 12pt font, then you can alter the line as follows:

```
\documentclass{report} (Defaults to 10pt font)
\documentclass[12pt]{report} (Alters to use 12pt font)
```

Preamble Options

The following options can be put in the preamble area of a thesis (after the `\usepackage{isuthesis}` command and before the `\begin{document}` command) to make alterations to a thesis:

<code>\bibliographystyle{isuplain}</code>	⇒ Sets bib-style; local options: <code>isuabbrv</code> , ⇒ <code>isualpha</code> , <code>isuapalike</code> , <code>isuplain</code> and <code>isuunsrt</code> .
<code>\chaptertitle</code>	⇒ Adds ‘Chapter’ before chapter #.
<code>\usepackage{subeqn}</code>	⇒ Adds extra equation numbering options.
<code>\alternate</code>	⇒ Sectional numbering down to subsection
<code>\alternatepart</code>	⇒ Sectional numbering at part level only.
<code>\alternatenum</code>	⇒ Sectional numbering at all levels.
<code>\nochap</code>	⇒ Removes chapter numbering— used after ⇒ <code>\alternatenum</code> for sectional numbering below chapter.

1.1.3 Compiling a thesis

When you are using the master file system, you always want to compile only the master file and never any of the parts of the master file. So you would always **PDFLaTeX** or **Typeset** the **thesis.tex** file and no other file of your thesis as that file always brings in all the other files.

1.2 Creating a Thesis Title Page

Here is an annotated template for a simple Master’s thesis title page from the file **titletoc.tex**:

<code>% Template Titlepage File</code>	⇒ Comment line.
<code>\title{This is the title of a thesis</code> <code>submitted to Iowa State University\\</code>	⇒ Thesis title. ⇒ If the title is long, use <code>\\</code>
<code>Note that only the first letter of</code> <code>the first word and proper names</code> <code>are capitalized}</code>	⇒ to break the thesis title at a logical ⇒ point to have the thesis title ⇒ go to a new line.
<code>\author{Wilbur Terrance Johnson}</code>	⇒ Author’s ‘diploma-style’ name.
<code>\degree{MASTER OF SCIENCE}</code>	⇒ Full degree title.
<code>\dept{Human Development and Family Studies}</code>	⇒ Full Dept. name.
<code>\major{Human Development and Family Studies</code> <code>(Marriage and Family Therapy)}</code>	⇒ Full Name of Major.
<code>\level{master’s}</code>	⇒ Setup for a Master’s Degree
<code>\mprof{Susan D. Ross}</code>	⇒ Major Professor’s Name.
<code>\notice</code>	⇒ <i>Optional</i> : Adds copyright notice.
<code>\maketitle</code>	⇒ Makes title and signature pages.

1.2.1 Notes

The Doctoral Dissertation

If you are working on a Doctoral Dissertation rather than a Master's thesis, you would un-comment the following lines:

```
%\degree{DOCTOR OF PHILOSOPHY}
%\level{doctoral}
%\format{dissertation}
%\committee{4}
%\members{Mary Jones \ \ Bjork Petersen \ \ Sam Anders \ \ Harold Jones}
```

The Creative Component

If you are working on a Creative Component and not a standard Master's thesis, you would un-comment the following lines:

```
%\format{Creative Component}
%\submit{the graduate faculty}
```

Command requirements

The `\dept` command will not work without the `\major` command. These commands may or may not be currently used in creating the thesis title.

1.2.2 Options

Title page options

Below are a list of standard title page commands for use with the `isuthesis` package. Note that not all of these items are currently in use on the title page:

<code>\title{Title}</code>	⇒ Thesis title
<code>\author{Author}</code>	⇒ Diploma-style thesis author
<code>\degree{DEGREE}</code>	⇒ Degree (in uppercase)
<code>\dept{Dept}</code>	⇒ Department
<code>\major{Major}</code>	⇒ Major
<code>\level{level}</code>	⇒ Thesis level normally master's or doctoral
<code>\mprof{Name}</code>	⇒ Major's Professor's name
<code>\notice</code>	⇒ Copyright notice

Below are a variety of other commands that are available to put additional items on the isuthesis title page. Note that not all of these items are currently in use on the title page:

<code>\format{format}</code>	⇒ Thesis format
<code>\members{Name \\Name}</code>	⇒ Committee members names separated by \\
<code>\committee{4}</code>	⇒ # of committee signature lines.
<code>\submit{submittal}</code>	⇒ Submitted to information
<code>\mprofs{Susan D. Ross}{Gregory McMann}</code>	⇒ Co-major professors.
<code>\codepts{Community Planning;}{Architecture}</code>	⇒ Co-departments.
<code>\comajors{Community Planning;}{Architecture}</code>	⇒ Co-majors.
<code>\minor{Music}</code>	⇒ Subject minor.
<code>\copyyear{1996}</code>	⇒ Year of thesis submission.

The following items though available are known to be no longer in use on the isuthesis title page:

<code>\interdept</code>	⇒ Interdepartmental Program—
<code>\dept{Biomedical Engineering}</code>	⇒ which goes just before <code>\dept</code> .
<code>\interdeptm</code>	⇒ Interdepartmental Major—
<code>\major{Developmental Biology}</code>	⇒ which goes just before <code>\major</code> .
<code>\signmajorum=3</code>	⇒ # of major prof. signature lines.
<code>\signdeptnum=3</code>	⇒ # of dept. signature lines.
<code>\signdept{Architecture}</code>	⇒ Title used for dept. signature.
<code>\signmajor{Biology}</code>	⇒ Title used for major signature.

Additional Frontmatter Sections

The following optional commands can normally be added after **titletoc.tex** to include additional parts to your thesis:

<code>\include{dedication}</code>	⇒ Brings in <code>dedication.tex</code> . (Dedication)
<code>\include{acknowl}</code>	⇒ Brings in <code>acknowl.tex</code> . (Acknowledgments)
<code>\include{abstract}</code>	⇒ Brings in <code>abstract.tex</code> . (Abstract)

A dedication page, acknowledgments page, or abstract page can follow the title page. All three of these frontmatter sections follow the same format or style. Here is a sample abstract from the file **abstract.tex**:

```
\specialchapt{ABSTRACT}
```

This is the text of my abstract that is part of the thesis itself.

The abstract describes the work in general and the heading and style match the rest of the document.

The `\specialchapt` command starts a new chapter-like area and does not increment the chapter number but is included in the Table of Contents. The `\specialchapter` command is similar to `\specialchapt` but gets a different level of indentation in the Table of Contents. The Dedication area uses a `\chapter*` command rather than `\specialchapt` so that it is not included in the Table of Contents.

1.3 Creating Thesis Chapters

Here is an annotated template for a chapter from a simple Master's thesis edited from the file `chapter1.tex`:

<code>% Chapter 1 of Thesis Template</code>	<code>⇒</code> Comment line.
<code>\chapter{OVERVIEW}</code>	<code>⇒</code> Titles the Chapter.
This is the opening paragraph to my thesis which explains in general terms the concepts and hypothesis which will be used in my thesis.	<code>⇒</code> Thesis text.
	<code>⇒</code> More thesis text.
	<code>⇒</code> Use a blank line—
	<code>⇒</code> to go to a new paragraph.
	<code>⇒</code> Text.
	<code>⇒</code> More text.
With more general information given here than really necessary.	<code>⇒</code> Titles this section.
<code>\section{Introduction}</code>	<code>⇒</code> Text.
Here initial concepts and conditions are explained and several hypothesis are mentioned in brief.	<code>⇒</code> More text.
<code>\subsection{Hypothesis}</code>	<code>⇒</code> Titles this subsection.
Here one particular hypothesis is explained in depth and is examined in the light of current literature.	<code>⇒</code> Text.
	<code>⇒</code> More text.
<code>\subsubsection{Parts of the hypothesis}</code>	<code>⇒</code> Titles this subsubsection.
Here one particular part of the hypothesis that is currently being explained is examined and particular elements of that part are given careful scrutiny.	<code>⇒</code> Text.
	<code>⇒</code> More text.
<code>\paragraph{An unusual error in part c of the hypothesis}</code>	<code>⇒</code> Still more text.
Here I given details and information on the part of the hypothesis that has an error in it which may add to further complications.	<code>⇒</code> Titles this paragraph.
	<code>⇒</code> Text.
	<code>⇒</code> More Text.
	<code>⇒</code> Still more text.
<code>\subparagraph{Details of the error}</code>	<code>⇒</code> Titles this subparagraph.
Here I give even more detailed information than before on the error and eventually put everyone to sleep.	<code>⇒</code> Text.
	<code>⇒</code> Even more text.

1.3.1 Notes

Sectioning commands available in isuthesis

The following standard L^AT_EX sectioning commands are available in the isuthesis package:

```
\part      \subsection    \paragraph  
\chapter  \subsubsection  \subparagraph  
\section
```

Don't number your section levels— let L^AT_EX do that for you. See subsection 1.1.2 for more information on changing the standard isuthesis package numbering style.

Levels of sectioning

A chapter that contains a section should have two or more sections— a section that contains a subsection should have two or more subsections— a subsection that contains a subsubsection should contain two or more sub-subsections. . . or, more generally speaking, don't use a lower subdivision of sectioning unless you have two or more units of that sectioning.

Chapter Titles

Chapter titles should be in all uppercase letters. This is not done automatically by the isuthesis package. The isuthesis template comes with the standard chapter titles for a standard Master's thesis: OVERVIEW, REVIEW OF LITERATURE, METHODS AND PROCEDURES, RESULTS and SUMMARY AND DISCUSSION.

1.3.2 Options

Usual chapter options

The following command options can be used within or around thesis chapters to make alterations to a thesis:

<code>\newpage</code>	⇒ Go to a new page.
<code>\footnote{Ibid.}</code>	⇒ Creates a footnote.
<code>\begin{singlespacing}</code>	⇒ Starts a single-spacing environment.
<code>\end{singlespacing}</code>	⇒ Ends a single-spacing environment.
<code>\begin{onehalfspacing}</code>	⇒ Starts a onehalf-spacing environment.
<code>\end{onehalfspacing}</code>	⇒ Ends a onehalf-spacing environment.
<code>\begin{doublespacing}</code>	⇒ Starts a double-spacing environment.
<code>\end{doublespacing}</code>	⇒ Ends a double-spacing environment.
<code>\begin{thebibnpage}</code>	⇒ Starts a bibliography without a page break
	⇒ normally used at the end of a chapter
<code>\end{thebibnpage}</code>	⇒ Ends a chapter bibliography

To use thebibnpage environment, you must add:

`\usepackage{thebibnpage}`

to the preamble of your document. Thebibnpage environment comes with the isuthesis package of files but needs to be added separately.

Unusual chapter options

The following command options can be used within or around thesis chapters to make alterations to a thesis but are most commonly used in an alternative thesis style:

<code>\reset</code>	⇒ Resets most chapter level counters.
<code>\specialchapt{Overview}</code>	⇒ Starts a new chapter with no chapter numbering.
<code>\specialchapter{Overview}</code>	⇒ Like <code>\specialchapt</code> but different TOC level.
<code>\startabstract</code>	⇒ Sets up a header for an abstract.
<code>\paperinfo{Unpublished}</code>	⇒ Paper information for header.
<code>\paperauthor{Jane Smith}</code>	⇒ Paper author info for header.
<code>\part{Paper}</code>	⇒ Sectional level above <code>\chapter</code> —
	⇒ mainly used to organize chapters into a paper.
<code>\specialpart{Paper}</code>	⇒ Starts a new part with no part numbering.

Warning: use some of these options with extreme caution. Too much tinkering can destroy the overall effect of a documentclass or package.

1.4 Creating a Thesis Appendix & Bibliography

Here is an annotated template for an appendix from a simple Master's thesis edited from the file **appendix1.tex**:

<code>% Plain appendix1</code>	⇒Comment line.
<code>\appendixtitle</code>	⇒Adds ‘Appendix’ before appendix #.
<code>\appendix</code>	⇒Alters <code>\chapter</code> to create an appendix.
<code>\chapter{Additional Material}</code>	⇒Titles first appendix.
This is the now the same as any other	⇒Appendix text.
chapter except that all sectioning levels	⇒More appendix text.
below the chapter level must begin	⇒Even more text.
with the *-form of the command.	⇒Some more text.
<code>\section*{More stuff}</code>	⇒Section title *-form so not in TOC.
Supplemental material.	⇒Etc.

Here is an annotated template for a second appendix from **appendix2.tex**:

<code>% Plain appendix2</code>	⇒Comment line.
<code>\chapter{Statistical Results}</code>	⇒Titles second appendix.
This is the now the same as any other	⇒Appendix text.
chapter except that all sectioning levels	⇒More appendix text.
below the chapter level must begin	⇒Even more text.
with the *-form of the command.	⇒Some more text.
<code>\section*{Supplemental Statistics}</code>	⇒Section title *-form so not in TOC.
More stuff.	⇒Etc.

Here is an annotated template for a bibliography from **biblio.tex**:

<code>% Sample plain bibliography</code>	⇒Comment line.
<code>\renewcommand{\bibname}{\centerline{BIBLIOGRAPHY}}</code>	⇒Re-titles Bibliography
<code>\unappendixtitle</code>	⇒Removes ‘Appendix’ before chapter title
<code>\interlinepenalty=300</code>	⇒Raises paragraph break penalty.
<code>\begin{thebibliography}{99}</code>	⇒Starts biblio. sets up 10–99 bibitems.
<code>\addcontentsline{toc}{chapter}{BIBLIOGRAPHY}</code>	⇒Adds BIBLIOGRAPHY to Table of Contents.
<code>\bibitem[Allen, B.~S.~(1984)]{allen}</code>	⇒Creates bibitem for Allen.
Allen, B.~S. (1984). Learning and CBI.	⇒Can cite as <code>\cite{allen}</code> .
<code>\emph{Computing Research Journal},</code>	⇒More Allen.
<code>\emph{1}(1), 3–18.</code>	⇒Allen bibitem end.
<code>\filbreak</code>	⇒If near page bottom, fill with a blank.
	⇒Paragraph break for next bibitem.
<code>\end{thebibliography}</code>	⇒Ends biblio. environment.

1.4.1 Notes

Appendix Notes

The `\appendixtitle` command puts in the word ‘Appendix’ before the appendix number.

The `\appendix` command alters the `\chapter` command and turns any further chapter(s) in the document into appendices. The `\appendix` command should only be used once.

The *-form of the `\section` and below sectioning commands should be used in an appendix to keep these levels of sectioning out of the “Table of Contents”. Notice that the second appendix contains nothing unusual except the *-form of the section command.

Notes on the Bibliography

The bibliographic example `biblio.tex` shows a plain bibliography with standard bibliographic labeling. The `\unnappendixtitle` command removes ‘Appendix’ from the start of the Bibliographic area.

On the `\begin{thebibliography}{99}` line, the 99 reserves a number spot for 10-99 items in the bibliography. Use 9 for 1–10 items, 99 for 10–99 items and 999 for 100–999 bibliographic items.

The `\interlinepenalty=300` command and the `\filbreak` commands are optional but are included to make sure that a bibliographic citation does not cross a page boundary as that is often considered to be unacceptable in a thesis or dissertation.

1.4.2 Options

Single Appendix

If you have only one appendix, in place of `\appendixtitle`, `\appendix` and `\chapter{Title}` in `appendix1.tex`; use the following:

```
\singleappendix
\specialchapt{APPENDIX\ \ Title}
```

The `\appendixtitle` command is currently a **required** appendix option unless you are using `\singleappendix`.

Bibliographic options

Other forms or styles of \LaTeX bibliographies are shown in Section 3.2 including the use of `BIBTEX` and a simplified `hangpar` environment.

Chapter 2

Alternate Thesis Examples

The following chapter shows thesis templates for two alternative style theses: a thesis as a series of papers and a thesis in parts. These files can be found online at: <http://css.ait.iastate.edu/Tex/Thesis/Alt/>. The PDF files found in the alternative thesis folder can give you an example as to what the thesis will look like when it is completed.

This form of a thesis should only be used with both the consent of your thesis committee and your major professor. You should also run this by the Thesis Office as the rules for alternate thesis types tend to change more often than the rules for a standard thesis.

2.1 Thesis as a Series of Papers

The following template produces a thesis using the `isuthesis` package which is a thesis done as a series of papers. It seems to be the most popular alternative thesis style but may need some changes depending on your Department or Area. The thesis is unnumbered by design and figure and table numbering restart with every new paper. This following information is from the `thesisalt1.tex` alternate thesis example file:

```
% Template file for an alternate thesis
\documentclass[11pt]{report}
\usepackage{isuthesis}
\usepackage[pdftex]{graphicx}
% Standard, old-style thesis
\usepackage{traditional}
% The next line is only used to get a sideways table/figure.
```



```

\usepackage{rotating}
% Bibliography without numbers or labels
\usepackage{natbib}
\bibliographystyle{isuapalike}
% Remove Chapter markings
%\nochap
% Sectional number within a paper
%\makeatletter
%\renewcommand{\theequation}{\thesection.\@arabic\c@equation}
%\makeatother
%\includeonly{titletoc,paper1}
%Optional Package to add PDF bookmarks and hypertext links
%If used, uncomment phantomsection commands to get LOT/LOF
% hyperlinks in the correct place
%\usepackage[pdftex,hypertextnames=false,linktocpage=true]{hyperref}
%\hypersetup{colorlinks=true,linkcolor=blue,anchorcolor=blue,citecolor=blue,
% filecolor=blue,urlcolor=blue,bookmarksnumbered=true,pdfview=FitB}
\begin{document}
\DeclareGraphicsExtensions{.jpg,.pdf,.mps,.png}
\include{titletoc}
% Optional thesis dedication
\include{dedication}
%\pdfbookmark[1]{TABLE OF CONTENTS}{table}
\tableofcontents
\addtocontents{toc}{\def\protect\@chapapp{}}
\cleardoublepage
%\phantomsection
\addcontentsline{toc}{chapter}{LIST OF TABLES}
\listoftables
\cleardoublepage
%\phantomsection
\addcontentsline{toc}{chapter}{LIST OF FIGURES}
\listoffigures
% Comment out the next line if NOT using chaptertitle
\addtocontents{toc}{\def\protect\@chapapp{CHAPTER\ }}
%Optional Acknowledgements
%\include{acknowl}
%Optional thesis abstract
%\include{abstract}
\newpage

```

```

\pagenumbering{arabic}
\include{paper1}
\reset
\include{paper2}
\reset
\include{paper3}
\reset
\include{paper4}
\include{appendix1}
\include{appendix2}
\include{biblio}
\end{document}

```

Here are parts from the top section of the **paper1.tex** file used within this template:

```

\specialchapt{THIS IS THE TITLE OF THE FIRST PAPER}
\paperinfo{published in the Journal of ABC}
\paperauthor{Jane Smith and Jesse Adams}

\section*{Abstract}
\addcontentsline{toc}{section}{Abstract}

```

This is the abstract to my paper which explains in general terms the concepts and hypothesis that will be used.

```

\section{Introduction}

```

Here initial concepts and conditions are explained and several hypothesis are mentioned in brief.

2.2 A Thesis in Parts

The following template produces a thesis using the `isuthesis` package which is a thesis done as a thesis in parts. The thesis has part numbering and continuous chapter numbering throughout the thesis. You may need to make some changes to this design depending on your Department or Area. This following information is from the **thesisalt2.tex** alternate thesis example file:

```

% Template file for a second alt. thesis
\documentclass[11pt]{report}
\usepackage{isuthesis}
\usepackage[pdftex]{graphicx}
% Standard, old-style thesis
\usepackage{traditional}
\chaptertitle
% Old-style, thesis numbering down to subsubsection
\alternate
% The next line is only used to get a sideways table/figure.
\usepackage{rotating}
% Bibliography without numbers or labels
\usepackage{natbib}
\bibliographystyle{isuapalike}
%\includeonly{titletoc,part1,chapter1}
%Optional Package to add PDF bookmarks and hypertext links
%If used, uncomment phantomsection commands to get LOT/LOF hyperlinks
% in the correct place
%\usepackage[pdftex,hypertextnames=false,linktocpage=true]{hyperref}
%\hypersetup{colorlinks=true,linkcolor=blue,anchorcolor=blue,citecolor=blue,
% filecolor=blue,urlcolor=blue,bookmarksnumbered=true,pdfview=FitB}
\begin{document}
\DeclareGraphicsExtensions{.jpg,.pdf,.mps,.png}
\include{titletoc}
% Optional thesis dedication
\include{dedication}
%\pdfbookmark[1]{TABLE OF CONTENTS}{table}
\tableofcontents
\addtocontents{toc}{\def\protect\@chapapp{}}
\cleardoublepage
%\phantomsection
\addcontentsline{toc}{chapter}{LIST OF TABLES}
\listoftables
\cleardoublepage
%\phantomsection
\addcontentsline{toc}{chapter}{LIST OF FIGURES}
\listoffigures
% Comment out the next line if NOT using chaptertitle
\addtocontents{toc}{\def\protect\@chapapp{CHAPTER\ }}
%Optional Acknowledgements

```

```
%\include{acknowl}  
%Optional thesis abstract  
%\include{abstract}  
\newpage  
\pagenumbering{arabic}  
\include{part1}  
\include{chapter1}  
\include{chapter2}  
\include{part2}  
\include{chapter3}  
\include{chapter4}  
\include{chapter5}  
\include{appendix1}  
\include{appendix2}  
\include{bibliio}  
\end{document}
```

2.3 Changing the Base Font

You can also change away from the base Computer Modern font in your thesis when you are using the isuthesis package though this change has not been thoroughly tested and is probably not recommended.

Simply place the following line in the preamble of your thesis:

```
\usepackage{fontpackage}
```

Current font packages you can choose from include: **times**, **newcent**, **palatino**, **bookman** and **helvet**.

Chapter 3

Additional Thesis Items

The following chapter shows additional standard \LaTeX commands and other \LaTeX commands and environments which are unique to isuthesis that also may be useful in creating a thesis.

3.1 Tables & tabular; Figures & graphics

Here is an annotated template for a simple table from **chapter3.tex** of the standard thesis template:

<code>\begin{table}[h!tb] \centering</code>	\implies Begins & centers table.
<code>\isucaption{This table shows</code>	\implies Caption for a table—
<code>nothing}</code>	\implies goes at start of table.
<code>\label{nothing}</code>	\implies Labels table for referencing.
	\implies Blank line.
<code>\vspace{2 in}</code>	\implies Leaves 2 inches of blank space.
<code>\end{table}</code>	\implies Ends table.

Here is an annotated template for a simple figure from **chapter3.tex** of the standard thesis template:

<code>\begin{figure}[h!tb] \centering</code>	\implies Starts & centers figure.
	\implies Blank line.
<code>\vspace{2 in}</code>	\implies Leaves 2 inches of blank space.
<code>\isucaption{This figure</code>	\implies Caption for a figure—
<code>shows Durham Centre}</code>	\implies goes at end of a figure.
<code>\label{moon}</code>	\implies Labels figure for referencing.
<code>\end{figure}</code>	\implies Ends figure.

Here is an annotated template for a more complex table from **chapter4.tex** of the standard thesis template:

<code>\begin{table}[h!tb] \centering</code>	\implies Begins & centers table.
<code>\setlength{\captionwidth}{3 in}</code>	\implies Restricts width to 3 in.
<code>\isucaption{This table nothing much but is an example of a complete table}</code>	\implies Caption for a table— goes at start of table.
<code>\label{data}</code>	\implies Labels table for referencing.
<code>\begin{tabular}{lcc}</code>	\implies Starts tabular environment.
<code>Element & Control & Experimental\\</code>	\implies The & skips to next element.
<code>\\</code>	\implies Skips a line.
<code>Moon Rings & 1.23 & 3.38 \\</code>	\implies \\ ends a tabular line.
<code>Moon Tides & 2.26 & 3.12\\</code>	\implies More tabular.
<code>Moon Walk & 3.33 & 9.29\\</code>	\implies Even more tabular.
<code>\end{tabular}</code>	\implies Ends tabular environment.
<code>\end{table}</code>	\implies Ends table.

Here is an annotated template from a more complex figure from **chapter4.tex** of the standard thesis template:

<code>\begin{figure}[h!tb] \centering</code>	\implies Begins & centers figure
	\implies Blank line.
<code>\includegraphics{dc5.jpg}</code>	\implies Brings in graphic dc5.jpg
	\implies standard .jpg/.png/.gif graphics only.
<code>\isucaption{This figure shows Durham Centre}</code>	\implies Caption for a figure— goes at end of a figure.
<code>\label{mgraph}</code>	\implies Labels figure for referencing.
<code>\end{figure}</code>	\implies Ends figure.

3.1.1 Notes

Figures and tables are floating items in \LaTeX ; that is, they appear as a single unit on the page and if they don't fit on the current page they must be “floated” to the next page. The positional placement items `[h!tb]`, which come in brackets following the start of a table or figure, direct \LaTeX as to where this “floating” item should occur on the page:

h - here **t** - top of next page

b - bottom of next page **p** - on a page by itself

Positional placements items should be listed in order of preference. You can place a **!** after any positional placement item to tell \LaTeX to “try harder”

to use the placement item indicated. The default positional placement items are [tbp] which are good for creating a book but not as good for a thesis.

Also note the use of \isucaption as opposed to the standard \caption command as normally used in L^AT_EX. This is simply a locally customized version of the standard \caption command.

3.1.2 Options

The following options can be used with tables or figures:

- `\centering` ⇒ Centers table/figure between right and left margins—
⇒ must come after positional placement items.
- `\captionwidth` ⇒ Restricts caption width so that it fits better
⇒ over tables/figures that aren't full page width.
- `\label{name}` ⇒ Labels table/figure so can reference with `~\ref{name}`.
⇒ `\isucaption` must directly precede table/figure labels.

For instance, if you label a figure as `\label{bell}`; you can then reference that figure in your document by entering: ...as can be seen in Figure`~\ref{bell}`.

The `\clearpage` command used outside of a table or figure starts a new page and clears out all “floating” tables and figures before continuing on with more text. It's useful to try if you get an error message about “L^AT_EX running out of memory” but is generally discouraged as it has a tendency to create large amounts of white space on the page.

Tabular environment

The tabular environment makes columns of items in L^AT_EX. At the start of a tabular environment (`\begin{tabular}`), you need to specify in braces the number of columns to create where each character you list is a new column:

- l** - left-justified **r** - right-justified **c** - centered

The following additional formatting options are also available:

- | - vertical line @{text} - adds text/space (like `\hspace`) onto every line.

Within the tabular environment (`Moon Rings & 1.23 & 3.38\`) use a `&` to go from one column to the next and use `\\` to end a row. The following additional options are also available:

- `\hline` ⇒ Draws a horizontal line the full table width.
- `\cline{n - m}` ⇒ Draws a horizontal line from column n to m.
- `\multicolumn{num}{col}{text}` ⇒ Combines *num* columns into a single column—
⇒ *col* contains a positional symbol like l, r or c.

`\includegraphics`

The isuthesis package uses the graphicx package which adds some additional options to the `\includegraphics` command:

```
\includegraphics[bb=llx lly urx ury,angle=angle, width=h_length,height=v_length,  
scale=factor,clip=true/false, draft=true/false]{filename}
```

where *llx*, *lly*, *urx*, *ury* contain the coordinates of the bounding box containing the part of the picture that is to be included. Complete information on `\includegraphics` is available via the references in the **Bibliography**.

3.2 Other Bibliographic Styles

Besides using the `thebibliography` environment shown earlier in Section 1.4, there are other bibliographic styles available in L^AT_EX like: the `hangpar` environment, BIBTEX and other variations like NATBIB. Be forewarned, many Departments are very particular about the kinds of bibliography that they will accept so always check with your Department or Research Advisor before committing to a particular type of bibliography.

Here is an annotated template for a `hangpar` style bibliography edited from the standard template file `oldbib.tex`:

<code>% A hangpar Bibliography</code>	⇒ Comment line.
<code>\specialchapt{BIBLIOGRAPHY}</code>	⇒ Titles Chapter (no number/header)
<code>\interlinepenalty=300</code>	⇒ Raises paragraph break penalty.
<code>\begin{singlespace}</code>	⇒ Starts singlespace mode.
<code>\begin{hangpar}</code>	⇒ Starts hanging paragraph mode.
	⇒ Blank line starts new citation.
Bruner, J. (1960). { <i>The process</i>	⇒ Citation begins.
of education}. NY: Random House.	⇒ Citation ends.
<code>\filbreak</code>	⇒ Go to new page if near bottom.
<code>\end{hangpar}</code>	⇒ Ends hanging paragraph mode.
<code>\end{singlespace}</code>	⇒ Ends singlespace mode.

Here is an annotated sample that shows an example of how to integrate a BIBTEX-style of bibliography:

<code>\bibliographystyle{isuplain}</code>	⇒ Choose style of bibliography.
<code>\include{titletoc}</code>	⇒ Style choice goes at start of thesis.
<code>:</code>	⇒ The rest of this goes after the appendices.

<code>\renewcommand{\bibname}{\centerline{BIBLIOGRAPHY}}</code>	⇒Changes biblio. titling.
<code>\unappendixtitle</code>	⇒Resets chapter titling.
<code>\addcontentsline{toc}{chapter}{BIBLIOGRAPHY}</code>	⇒Adds biblio. to TOC.
<code>\bibliography{mybib}</code>	⇒Gets biblio. from mybib.bib.

Here is an annotated sample for a BIBTEX style bibliography which works with the previous example entitled **mybib.bib**:

<code>@book{gn:struss,</code>	⇒Book: use <code>\cite{gn:struss}</code> to reference.
<code>AUTHOR = "Joseph A. Struss",</code>	⇒Lists author.
<code>TITLE = "The Big Wide World</code>	⇒Lists title.
<code>and Welcome to It",</code>	⇒Can enclose entry with “ ” or { }.
<code>PUBLISHER = Permanent Ink Press,</code>	⇒Lists publisher.
<code>ADDRESS = {Racene, WS},</code>	⇒Lists address of publisher.
<code>YEAR = 1992}</code>	⇒Lists year.

NATBIB is just a bibliographic variation for many types of bibliographic environments in L^AT_EX which uses a Natural Sciences style bibliographic labeling process for citations. The NATBIB package `\usepackage{natbib}` is included by default in the standard isuthesis template as that is the style of bibliography most often used at Iowa State.

3.2.1 Notes

With each citation, you also enter a *key* for the citation that is also used with the `\cite` command so that L^AT_EX knows which reference you are citing. The keyword does not appear in the text of the document and is only there to link the `\cite` to the bibliographic citation. This keyword can be made up of any combination of letters, digits or special symbols except commas.

The thebibliography environment

On the `\begin{thebibliography}{99}` line, the ‘99’ is a place holder for the number of characters in the bibliographic label. By default, the bibliographic label is a number so using ‘99’ you could have up to 99 bibliographic citations.

If you want to use a label rather than a number for each citation, add the [label] option to the `\bibitem` command. So if one wanted a citation labeled **Knight**, the `\bibitem` command would begin with: `\bibitem[Knight]{key}`.

The BIBTEX bibliography

There are currently many standard BIBTEX bibliographic styles to choose from but the most popular are: `abbrv`, `alpha`, `apalike`, `ieeetr`, `plain`, `siam` and `unsrt`. A special `isu` version of each of these styles is also available by adding `isu` in front of the standard BIBTEX style name (for instance, `alpha` \Rightarrow `isualpha`).

To use BIBTEX, `pdflatex` your document twice (may get an error message the first time) then `bibtex` your document once; and after that `pdflatex` your document one more time. BIBTEX will find the `\cite` commands in your document and from them create a bibliography. BIBTEX is a separate compiler from PDFLATEX.

BIBTEX is unique in that it uses a bibliographic database to keep track of individual citations. You must make an entry for each citation that you might be interested in using and BIBTEX puts into your bibliography only those citations that were actually used in the document. This makes BIBTEX very useful if you are going to be using your citations more than once as the same BIBTEX file can be used over and over again. For more information on BIBTEX, look in “The L^AT_EX Companion”.

The NATBIB bibliography

Both the `thebibliography` environment and BIBTEX use a numbered / labeled scheme to reference bibliographic citations that many areas and departments at Iowa State find to be unacceptable. NATBIB provides a bibliographic variation for many bibliographic environments that produces a standard bibliography without citations being automatically labeled in a numeric or alphabetic sequence. Complete information on NATBIB can be found at:

www.ctan.org/tex-archive/macros/latex/contrib/natbib/natbib.pdf

In a NATBIB bibliography done with the `thebibliography` environment, put what you want your citation to return when referenced in the option area of the `bibitem`:

```
\bibitem[Bruner, J.~(1960)]{bruner}
Bruner, J. (1960). \emph{The process of education}.
New York: Random House.
```

In this example, the command `\cite{bruner}` would return “Bruner, J. (1960)”. See **Chapter 2** of the standard `isuthesis` template to see how this looks.

3.3 Tricks of the Trade

3.3.1 Lining up on a decimal point

Since \LaTeX uses proportional pitched fonts with different sized letters/numbers, it is normally difficult to align a group of numbers on a decimal point. A interesting way to do this in a tabular environment is to split a number across two columns with a $\text{\r@{.}}$ and then use the \multicolumn command to span columns in the header. For example:

```
\begin{tabular}{lr@{.}lr@{.}l}
Group & \multicolumn{2}{c}{Reading}
& \multicolumn{2}{c}{Writing} \\
5th Grade & 3 & 32 & 76 & 52 \\
6th Grade & 219&927 & 114 & 9542 \\
\end{tabular}
```

\implies

Group	Reading	Writing
5th Grade	3.32	76.52
6th Grade	219.927	114.9542

3.3.2 Rotating a table or figure

The standard isuthesis template includes the rotating package which allows one to use the following additional document environments:

```
\begin{sidewaystable}... \end{sidewaystable}
\begin{sidewaysfigure}... \end{sidewaysfigure}
```

The \sidewaystable and \sidewaysfigure environments are used just like the \table and \figure environments (without positional placement items) except that they produce fully rotated tables and figures on a separate page.

3.3.3 Continuing a table or figure

\LaTeX does not allow tables or figures to be over one page in length. To create a two page table/figure: end your current table at the bottom of the first page and then on the next page start a new table using $\text{\isucontinuecaption}$ instead of \isucaption . The $\text{\isucontinuecaption}$ will decrease the current table/figure number and mark it as a continuation of the last table/figure.

3.3.4 Verbatim environment

The verbatim environment ($\text{\begin{verbatim}} \dots \text{\end{verbatim}}$) in \LaTeX produces text exactly the way that it is typed / formatted. Verbatim is useful for putting in text that you don't want \LaTeX to process. You can also use: $\text{\verb* verbatim text*}$ to produce a small verbatim environment on a line where $*$ can be any character not used in the verbatim text.