The \texttt{fsuthesis} Class*

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1 Introduction

The \texttt{fsuthesis} class may be used to generate Theses and Dissertations in the format required by the Florida State University Graduate School as described by the document \textit{Guidelines \\& Requirements for Electronic Theses, Treatises and Dissertations}, 2019–2020 edition. This class extends the standard \LaTeX\ document class \texttt{report.cls}, adding elements and re-formatting as required to comply with FSU’s standards.

Official changes to this class file will be reflected in the first two elements of the version number. Any local changes to this file may be tracked by incrementing the third element of the version number (see the \verb|\ProvidesClass| macro above in this document’s source code).

**Dependencies:** In addition to the primary \LaTeX\ packages, this class requires the external package \texttt{ifpdf}, which ships with most distributions of \LaTeX.  

2 What Has Gone Before

The first FSU \LaTeX\ style file was based on macros from Stanford University, modified to comply with FSU standards by Meteorology professor Jon Ahlquist. Mimi Burbank, until her retirement from the Supercomputer Computations Research Institute (SCRI), maintained another set of macros for campus-wide use. Subsequent updates were provided by Wickus Nienaber, a Ph.D. student in Computer Science, and Jack Tyndall, a staff member with the Graduate School.

Started in 2009, this version is an entirely new re-write by Bret Whissel, presently with the FSU Information Technology Services department’s Linux Enterprise Applications and Systems Group. Corrections and improvements should be directed to his attention at \texttt{bwhissel@fsu.edu}.

*This document corresponds to \texttt{fsuthesis} v3.9.0, dated 2020/10/12.
3 Option Registration

In addition to the options provided by the standard report class, this class provides four supplemental options: hardcopy, expanded, chapterleaders, and copyright.

The hardcopy option will increase the size of the margin along the binding-edge. If the standard option twoside is also given, then the binding-edge will be shifted for even and odd pages, and the standard option openright will be forced.

The expanded option increases the spacing of baselines. This requires many subtle tweaks in standard report definitions, as vertical spacing at chapter headings and other places becomes irregular and must be accounted for.

The chapterleaders option causes the display of leader dots in the Table of Contents for chapter headings, which would otherwise be suppressed. This could be nice for people who request that section/sub-section headings in the ToC be suppressed.

The copyright option includes a copyright notice on the title page of the document, using the author’s name and defense year to generate the line.

Declaring the document options merely sets appropriate flags, which we define here. We deal with the options later.

The rest of this section is boiler-plate for handling the options and passing standard options on to the report class for handling. The final step is to load the report class, so that we may continue to override its features here. Then we load the ifpdf package since we will need it down the road.

4 Establishing Page Margins

Now we’ll set up page margins that FSU expects. In general, the Guidelines & Requirements for Electronic Theses, Treatises and Dissertations requires that margins be at least 1 inch on all sides.

We do not use running headers, but should someone turn them on, we set them to appear (illegally) in the area above the page body.
\textwidth  We set the \textwidth to accommodate a fixed number of lines whose heights are defined by \baselineskip. (This parameter is established by the document font size selection.) We want the page body to occupy the entire vertical space, less the top and bottom margins and the space reserved for the page number. The Guidelines specify a 1/2-inch space between the last line and the page number, so we set \footskip to be in that ballpark to start. Once we've established the actual text height, we'll reset \footskip to absorb any additional space.

\begin{verbatim}
13 \setlength{\headheight}{\topskip}
14 \setlength{\headsep}{10pt}
\footskip

We set the \textwidth to accommodate a fixed number of lines whose heights are defined by \baselineskip. (This parameter is established by the document font size selection.) We want the page body to occupy the entire vertical space, less the top and bottom margins and the space reserved for the page number. The Guidelines specify a 1/2-inch space between the last line and the page number, so we set \footskip to be in that ballpark to start. Once we've established the actual text height, we'll reset \footskip to absorb any additional space.

15 \setlength{\footskip}{0.35in}
16 \setlength{\@tempdima}{\paperheight}
17 \addtolength{\@tempdima}{-2in}
18 \addtolength{\@tempdima}{-\footskip}
19 \divide\@tempdima\baselineskip
20 \@tempcnta=\@tempdima
21 \setlength{\textheight}{\@tempcnta\baselineskip}
\end{verbatim}

Now that the text height has been calculated, we fix the \footskip setting to take up the slack.

\begin{verbatim}
22 \setlength{\footskip}{\paperheight}
23 \addtolength{\footskip}{-2in}
24 \addtolength{\footskip}{-\textheight}
\end{verbatim}

\topmargin  Finally, we set \topmargin now that we've fixed the rest of the vertical space.

\begin{verbatim}
25 \setlength{\topmargin}{\paperheight}
26 \addtolength{\topmargin}{-2in}
27 \addtolength{\topmargin}{-\headheight}
28 \addtolength{\topmargin}{-\headsep}
29 \addtolength{\topmargin}{-\textheight}
30 \addtolength{\topmargin}{-\footskip}
\end{verbatim}

\textwidth  Accounting for the required margins, standard 8.5x11” paper allows a maximum \textwidth of 6.5 inches. The horizontal margins are derived from this column width, so with the following code, if a narrower papersize is selected (e.g., A4), the margins will be narrower.

\begin{verbatim}
31 \setlength{\textwidth}{6.5in}
32 \setlength{\@tempdima}{\paperwidth}
33 \addtolength{\@tempdima}{-2in}
34 \addtolength{\@tempdima}{-\textwidth}
35 \divide\@tempdima by2
36 \setlength{\oddsidemargin}{\@tempdima}
37 \setlength{\evensidemargin}{\@tempdima}
\end{verbatim}
5 Processing the Document Options

5.1 Handling the hardcopy Option

For printing hard copies of a thesis or dissertation, we allow a little extra margin space along the binding edge. The size of this extra space is defined by \evenoddoffset. For two-sided hard copies, we force chapters (and everything using that level heading) to begin on right-hand (recto, odd-numbered) pages. The margin adjustments are added to the \begin{document} hooks, so that the user may redefine \evenoddoffset in the document preamble. The hardcopy option will produce a non-compliant document, but it may be nice for a personal hard copy.

\newlength{\evenoddoffset}
\setlength{\evenoddoffset}{0.25in}
\if@hardcopy%
  \AtBeginDocument{\addtolength{\textwidth}{-\evenoddoffset}%
  \addtolength{\oddsidemargin}{\evenoddoffset}}
\if@twoside\@openrighttrue%
  \AtBeginDocument{\addtolength{\evensidemargin}{-\evenoddoffset}}
\else
  \AtBeginDocument{\addtolength{\evensidemargin}{\evenoddoffset}}\fi
\fi

5.2 Handling the chapterleaders Option

This option makes a minor change to the Table of Contents by adding leader dots from the chapter title to the page number. The default \LaTeX report class does not provide leaders on chapter headings, just section and lower heading levels. If the user is writing a paper without subheadings, then the appearance of the Table of Contents might be improved by including such leader dots.

\l@chapter If the user has requested the chapterleaders document option, \l@chapter is re-defined to provide the leaders as requested.

\ifch@pleaders
  \renewcommand*{\l@chapter}[2]{%
    \ifnum \c@tocdepth >\m@ne
      \addpenalty{-\@highpenalty}%
      \vskip 1.0em \@plus\p@
      \l@dottedtocline{0}{0pt}{1.5em}{\bfseries#1}{\bfseries#2}#3
    \fi}
\fi

5.3 Handling the expanded Option

Expanded spacing requires a lot of tweaking. The standard report-class mechanisms allow a user to redefine \baselinestretch, and then all baseline leading is increased by this factor. Instead, the expanded spacing environment stretches the \baselineskip by half again as much, but only for the normal font size in the
main body of the text. Other environments revert to single-spacing (e.g., the various Tables of Contents in the front matter, table and figure captions, footnotes), and vertical spacing in list environments is also scaled back.

The definitions which follow are only defined if the expanded option has been selected.

56 \if@expanded

5.3.1 Baseline Parameters

\adjbaselineskip\blstretchiness\smblstretchiness

To start, we define the adjustment to \baselineskip to be some fraction of the original \baselineskip. This adjustment is not defined to be a rubber length, since we generally want fixed, predictable baselines while we are in single-space mode. In expanded spacing mode, however, we can allow a little stretchiness since we’ve already got some whitespace between lines. We define some baseline stretchiness with \blstretchiness, and a smaller amount of stretchiness with \smblstretchiness.

57 \newlength{\adjbaselineskip}%
58 \setlength{\adjbaselineskip}{0.5\baselineskip}%
59 \def{\blstretchiness}{0pt plus .4pt minus .3pt}
60 \def{\smblstretchiness}{0pt plus .3pt minus .2pt}

Note: If tweaking \adjbaselineskip here, be sure to evaluate the \listbaselineskip parameter below as well. It may need to be adjusted if the baselineskip strays too far from 150%.

\listbaselineskip

We use the \listbaselineskip to reset to narrower spacing for list environments (see below). In the ballpark of the 150% expanded baselineskip, a baselineskip reduced to 80% of expanded looks OK.

61 \newlength{\listbaselineskip}%
62 \@tempdima=\baselineskip\advance\@tempdima by\adjbaselineskip
63 \setlength{\listbaselineskip}{0.8\@tempdima}

5.3.2 Redefining \normalsize

\FSU@onormalsize\normalsize\expandspacing

We preserve the original definition of \normalsize in \FSU@onormalsize, and then we redefine \normalsize to call \expandspacing instead. \expandspacing first calls the old definition of \normalsize to establish the original baselines. (Otherwise, multiple calls to \expandspacing will generate wider and wider baseline spacings.)

64 \let{\FSU@onormalsize=\normalsize}%
65 \newcommand{\expandspacing}{\FSU@onormalsize}%
66 \addtolength{\baselineskip}{\adjbaselineskip}%
67 \addtolength{\baselineskip}{\blstretchiness}%
68 \let{\normalsize=\expandspacing}%
5.3.3 Chapter Heading Adjustment

While in expanded-spacing mode, the first line of text after chapter headings will be set a little lower than if we were in single-space mode. (We will be in single-space mode for the automatically-generated lists in the front-matter, for example, while most of the other chapter-level sections will be in expanded-spacing mode.) To compensate, we should call the macro \afterheadadj to remove extra vertical space when we go into expanded-spacing mode after chapter headings.

\newcommand{\afterheadadj}{\addvspace{-\adjbaselineskip}}%

5.3.4 Adjustments to the \list Environments

In expanded-spacing mode, most of the \list environments look pretty bad if left with the standard expanded baselines. We attempt to compensate by reducing the amount of baseline skip while in list mode. We accomplish this by first calling the standard list startup machinery, and then reducing the baseline skip and baseline stretchiness.

\f@olist
\list
We preserve the regular function of the \list command in the macro \f@olist, and then we redefine \list to scale back the standard expanded spacing in the list environments. The \baselineskip adjustment occurs only in the outer-most \list environment. (All inner \lists will share the same reduced \baselineskip.)

\let\f@olist=\list
\def\list#1#2{\f@olist{#1}{#2}\ifnum\@listdepth=1\setlength{\baselineskip}{\listbaselineskip}\addtolength{\baselineskip}{\smblstretchiness}\fi}

\f@oendlist
\endlist
After our mutation of \list, we undo our damage here by re-defining \endlist to restore expanded spacing at the close of the outer-most \list environment.

\let\f@oendlist=\endlist
\def\endlist{% \f@oendlist \ifnum\@listdepth=0\normalsize\fi}

verbatim A verbatim environment looks awkward with expanded spacing, so we re-define the environment to revert to standard spacing here. We handle both the standard and starred versions. (These definitions are borrowed from the \LaTeX code and modified.)

\let\f@overbat=verbatim
\expandafter\let\expandafter\f@ooverbats\csname endverbatim\endcsname
\let\f@oendverb=\endverbatim

5.3.5 Fallback Definitions

We allow our redefinitions to be NO-OPs if the \texttt{expanded} document option has not been selected. (Some of our later macro definitions attempt to call a few of the macros above without testing \texttt{if@expanded}.)

\else
\let\expandspacing=\relax
\let\FSU@onormalsize=\relax
\let\afterheadadj=\relax
\let\f@olist=\list
\let\f@oendlist=\endlist
\fi

\FSU@onormalsize

\texttt{singlespaced} There may be times when it is necessary to provide single-spacing while in \texttt{expanded} mode. This environment provides that. If not in expanded mode, it becomes a normal paragraph.

\newenvironment{singlespaced}
{\par\if@expanded\FSU@onormalsize\addvspace{\adjbaselineskip}\fi}{\par}

6 Testing the Presence of \texttt{hyperref}

\if@hyperloaded We may want to enhance the behavior of a few of our macros if the \texttt{hyperref} package has been loaded. We cannot test for package loading after \texttt{begin\{document\}}, and the user's \texttt{usepackage\{hyperref\}} will have occurred after this file has been loaded. So what we can do is create a new test here and have it initialized in the \texttt{begin\{document\}} hooks. This test is used to add PDF bookmarks to the title page and to the table of contents page (if \texttt{hyperref} has been loaded).

\newif\if@hyperloaded
\AtBeginDocument{\ifpackageloaded{hyperref}{\@hyperloadedtrue}{\@hyperloadedfalse}}

7 Definition of Title Page Macros

7.1 Token Storage

\texttt{\@degree} These definitions should be redefined within the document's preamble, set to sane values using the corresponding macros in the next section.

\texttt{\@department} \texttt{\@college} \texttt{\@degreeyear} \texttt{\@defensedate} \texttt{\@manuscripttype}
Title Page Token-Setting Macros

These macros redefine the corresponding tokens described above. These should all be redefined within the preamble section of the thesis or dissertation, with the exception of \department, which may not be appropriate in some Schools or Colleges.

\makeatletter
\newif\if@department
\newcommand*{\degree}[]{\gdef\@degree{#1}}
\newcommand*{\department}[]{\gdef\@department{#1}\@departmenttrue}
\newcommand*{\college}[]{\gdef\@college{#1}}
\newcommand*{\degreeyear}[]{\gdef\@degreeyear{#1}}
\newcommand*{\defensedate}[]{\gdef\@defensedate{#1}}
\newcommand*{\manuscripttype}[]{\gdef\@manuscripttype{#1}}
\newcommand*{\semester}[]{}
\makeatother

Title Page Generation

This macro generates the title page by expanding a few of the macros that should have been specified in the thesis document’s preamble. No page number is written on the title page, but the page should occupy all the vertical space (within the margins), including the space normally occupied by the page number. The whole page is enclosed in a centering environment, within the \texttt{report} class’s \texttt{titlepage} environment.

If the \texttt{hyperref} package has been loaded, we first add a PDF bookmark to the title page for convenience. Then the pagebody is expanded vertically by the amount $\texttt{footskip}$. Next we restore single-spacing with \texttt{\FSU@onormalsize}. (We’ll double-space manually by inserting $\texttt{\baselineskips}$ where necessary.)
use \vfill to distribute vertical white space evenly across the page. We don’t
know how long the user’s title is, and we’ll let \LaTeX decide how best to break the
title into multiple lines. However, the title should be double-spaced, so we double
\baselineskip before processing the title. This adds one extra blank line before
the title, so we compensate by \vskiping a negative \baselineskip first.

8 Definition of Committee Membership Page Macros

8.1 Committee Membership Page Definitions

These macros control the width of the committee member column and the vertical
space between members. The \commwidth length determines the width of the
name column. Names and titles are set flush-left within this column, but the
column itself is set flush-right on the page. Therefore, increasing the width here
will move the start of the column to the left.

We allow plenty of vertical stretchiness between entries as defined here in the
\commskip parameter, and significant shrink capacity as well. With this arrange-
ment we can accommodate three to ten committee members without stressing the page design significantly.
164 \newlength{\commwidth}
165 \setlength{\commwidth}{4in}
166 \newlength{\commskip}
167 \setlength{\commskip}{0.5in plus0.25fil minus.3in}

\committeeperson

Theses/Dissertations require listing the student’s graduate committee. Committee members are added to the page by means of the \committeeperson macro. It works by expanding and re-defining the \@thecmems macro with additional arguments each time it is called. The committee page then inserts the macro’s text as is. I use \expandafter here since I just want one level of expansion rather than the complete-to-the-core expansion of \xdef. We account for the extra \vskip at the top of the column later.
168 \gdef\@thecmems{}
169 \newcommand{\committeeperson}{% 
170 \expandafter\gdef\expandafter\@thecmems\expandafter{% 
171 \@thecmems\vskip\commskip\makebox{\commwidth}[l]{#1}\n
172 \makebox{\commwidth}[l]{#2}}}

8.2 Committee Page Generation

\makecommitteepage

This macro inserts the boiler-plate text into a committee page. For the text at the top of the page, we first test whether the author and defense date information can fit on one line. If it can, we eject the line as is and start a new paragraph for the supervisory committee line. If it won’t fit (because the author’s name is exceedingly long), then allow the supervisory committee line to join with the previous line in a single paragraph.

When the \@thecmems macro was created, it included a \vskip before the first committee member. Before we expand the \@thecmems macro, we \vskip backwards so that we have tighter control over the spacing balance here. (It’s easier than inserting extra logic in the \expandafter series in the \committeeperson macro.)
173 \newcommand{\makecommitteepage}{\FSU@onormalsize\setcounter{page}{2}\%
174 \if@openright\cleardoublepage\else\clearpage\fi\%
175 \%\addtolength{\baselineskip}{0.5\baselineskip}\%
176 \setbox\@tempboxa=\hbox{\@author{} defended this\%
177 \MakeLowercase{\@manuscripttype} on \mbox{\@defensedate}.}\%
178 \ifdim\wd\@tempboxa>$\textwidth\%\addtolength{\baselineskip}{0.4\baselineskip}\
179 \noindent\unhbox\@tempboxa\%\par\%
180 \vfil\begin{flushright}\vskip-\commskip\%\noindent The members of the supervisory committee were:\par\%
181 \vfil\begin{flushright}\vskip-\commskip\%
182 \%\addtolength{\baselineskip}{0.4\baselineskip}\%\thechmems\end{flushright}\vfil\%
183 \vskip\baselineskip\%
184 \%\addtolength{\baselineskip}{0.5\baselineskip}\%
185 \noindent\%
186 The Graduate School has verified and approved the
Above-named committee members, and certifies that the \MakeLowercase{\@manuscripttype} has been approved in accordance with university requirements.

9 Setting PDF Metadata

Whether or not the user is aware of it, the PDF programs, drivers, and converters will set some document metadata in the output, such as document title, author, etc. If these are not set explicitly, then they could be set to some unknown values. Here we attempt to provide some adequate defaults. To start, we define a few extra macros which the user can use to enhance the metadata inserted into the document.

\gdef\@subject{}
\gdef\@keywords{}
\newif\if@subject
\newif\if@keywords
\newcommand*{\subject}[1]{\gdef\@subject{#1}\@subjecttrue}
\newcommand*{\keywords}[1]{\gdef\@keywords{#1}\@keywordstrue}
\@pdfmetadata
\@hypermetadata

We must provide two different methods for setting metadata, since the \hyperref package will ignore the PDF information keywords. Execution is deferred until the \begin{document}, so all the required information should be available. Note that the \hyperref package will convert many accented or special characters in the \@title and \@author strings (but not all) so that they may be properly included as PDF metadata. Without \hyperref, the \@author and \@title will probably not produce reliable results if they contain non-ASCII characters. (The same caveats apply to the \@subject and \@keywords strings.)

\def\@pdfmetadata{{\def\protect{}\def\{}%
  \edef\@litstr{/Title (\@title) /Author (\@author)}%
  \if@subject\edef\@litstr{\@litstr /Subject (\@subject)}\fi%
  \if@keywords\edef\@litstr{\@litstr /Keywords (\@keywords)}\fi%
  \expandafter\pdfinfo\expandafter{\@litstr}}}
\def\@hypermetadata{{\def\{}\edef\@nt{\@title}\
  \hypersetup{pdftitle={\@nt},pdfauthor={\@author}}%
  \if@subject\hypersetup{pdfsubject={\@subject}}\fi%
  \if@keywords\hypersetup{pdfkeywords={\@keywords}}\fi%
  \AtBeginDocument{{\ifpdf\if@hyperloaded\@hypermetadata\else\@pdfmetadata\fi\fi}}

10 Document Sections

Borrowing from the \book class, we add these two macros for helping to distinguish between front matter material and the body of the document. All page numbers are in small roman numerals for the front matter text; starting with the opening of the first chapter, pages are numbered starting with the arabic numeral “1”.

\newcommand{\frontmatter}{\pagernumering{roman}}
\newcommand{\mainmatter}{\%
11 Special Names

Here we (re)define heading names for special pages. In addition, a new \musexname macro is created for labeling the captions of musical examples. Other standard report macros defining heading names are listed here in commented-out form for reference. (Their default settings will be used unless overridden here or in the user’s document preamble.)

\newcommand*{\acknowledgename}{Acknowledgments}
\newcommand*{\biosketchname}{Biographical Sketch}
\renewcommand*{\contentsname}{Table of Contents}
\newcommand*{\listabbrevname}{List of Abbreviations}
\renewcommand*{\listfigurename}{}
\renewcommand*{\listtablename}{}
\newcommand*{\listmusexname}{List of Musical Examples}
\newcommand*{\listsymname}{List of Symbols}
\newcommand*{\musexname}{Example}
\newcommand*{\appendixtocname}{Appendix}

12 Front Matter Environments

The dedication page has no heading. Whatever text the user may provide will be placed about half way down the page. The acknowledgments page is formatted as a chapter heading page (without a chapter number). These pages are not listed in the table of contents.

\newenvironment{dedication}{%\if@openright\cleardoublepage\else\clearpage\fi%}{%\vfill\mbox{\vfill}%\pagebreak[4]}
\newenvironment{acknowledgments}{%\chapter*{\acknowledgename}\FSU@onormalsize\addcontentsline{toc}{frontmatter}{\acknowledgename}}{%\clearpage}
\newenvironment{listofsymbols}{%\chapter*{\listsymname}\FSU@onormalsize\addcontentsline{toc}{frontmatter}{\listsymname}}{%\clearpage}
\newenvironment{listofabbrevs}{%\chapter*{\listabbrevname}\FSU@onormalsize\addcontentsline{toc}{frontmatter}{\listabbrevname}}{%\clearpage}

Lists of Symbols or Abbreviations are not required, but if a user does include them, they have chapter-style headings, and they are included in the table of contents using the frontmatter classification. These pages are set to be single-spaced, as they are likely to contain tabular material.

\newenvironment{listofsymbols}{\chapter*{\listsymname}\FSU@onormalsize\addcontentsline{toc}{frontmatter}{\listsymname}}{%\clearpage}
\newenvironment{listofabbrevs}{\chapter*{\listabbrevname}\FSU@onormalsize\addcontentsline{toc}{frontmatter}{\listabbrevname}}{%\clearpage}
abstract The abstract environment is set to be in expanded spacing (if requested by document option), and an entry is added to the ToC using the frontmatter style.

\addcontentsline{toc}{frontmatter}{\listabbrevname}
\clearpage

\renewenvironment{abstract}{\chapter*{\abstractname}\normalsize\afterheadadj
\addcontentsline{toc}{frontmatter}{\abstractname}}{\clearpage\FSU@onormalsize}

13 Additional Front Matter Formatting

The FSU Guidelines require that table, figure, and musical example captions be listed in their entirety in the front matter of the document. Some of the captions can be quite lengthy. By default, \TeX wants to keep an entire caption on one page, rather than letting it be split between pages if necessary. This can lead to very bad spacing on the List of... pages. This behavior is contained within \TeX's \dottedtocline macro by setting interlinepenalty=10000. We redefine this macro here so that we can set interlinepenalty to a value of our own choosing. In addition, the original \dottedtocline macro created an overfull hbox if the page number exceeded the default \@pnumwidth value. For those rare occasions when the page number width might exceed this value, we allow the page numbers to consume an extra dot if necessary.

\newcount\listspenalty
\listspenalty=200
\def\@dottedtocline#1#2#3#4#5{%\ifnum#1>\c@tocdepth\else
\vskip\z@\@plus.2\p@
{\leftskip#2\relax\rightskip@tocrmarg\parfillskip-\rightskip
\parindent#2\relax\@afterindenttrue
\interlinepenalty=\listspenalty
\leavevmode\@tempdima#3\relax
\advance\leftskip\@tempdima\null
\nobreak\leaders\hbox{$\m@th\mkern\math@dotsep\mu\hbox{.}\mkern\math@dotsep\mu$}\hfill
\nobreak\setbox\@tempboxa\hbox{\normalfont\begingroup\normalcolor#5\endgroup}\
\ifdim\@pnumwidth<\wd\@tempboxa\hbox{\normalfont\begingroup\normalcolor#5\endgroup}\fi
\else\hb@xt@\@pnumwidth{\hfil\normalfont\begingroup\normalcolor#5\endgroup}\fi
\setbox\@tempboxa\null
{#4}\nobreak\leaders\hbox{$\m@th\mkern\math@dotsep\mu$}\hfill
\nobreak
\setbox\@tempboxa\hbox{\normalfont\begingroup\normalcolor#5\endgroup}\hfill
\nobreak}
\tableofcontents If the hyperref package has been loaded, it would be nice to have a PDF bookmark to the table of contents page. We need to redefine the original \tableofcontents
in order to add that functionality. We also set the \texttt{\listpenalty} to retain the default \LaTeX behavior of preventing entries from being split between pages.

\begin{verbatim}
\renewcommand{\tableofcontents}{
  \if@twocolumn\@restonecoltrue\onecolumn\else\@restonecolfalse\fi
  \chapter*{\contentsname
  \@mkboth{\MakeUppercase\contentsname}{\MakeUppercase\contentsname}}%
  \ifpdf\if@hyperloaded\pdfbookmark[0]{Table of Contents}{contents}\fi\fi
  {\listpenalty=10000\@starttoc{toc}\if@restonecol\twocolumn\fi}\
}\end{verbatim}

\texttt{\iffrontdded} This macro specifies how frontmatter entries in the \textit{Table of Contents} appear. Each entry is separated by a little vertical space, with leader dots to the page number.

\begin{verbatim}
\newif\iffrontdded
\newcommand*{\l@frontmatter}{%
  \iffrontdded\addvspace{1ex \@plus\p@}\else\frontddedtrue\fi
  \@dottedtocline{0}{0pt}{0pt}}
\end{verbatim}

\texttt{\texttt{\toclevel@frontmatter}} For setting up bookmarks, the \texttt{hyperref} package wants to know what level of the hierarchy various sections of the \textit{Table of Contents} are. We can hide the front matter entries behind the \textit{Table of Contents} entry by setting the frontmatter ToC level to 1 here.

\begin{verbatim}
\def{\toclevel@frontmatter}{1}
\end{verbatim}

\texttt{\ifbackadded} The “back matter” of the document consists of the References/Bibliography section and the Biographical Sketch. Since we’re approaching the end of the table of contents, there is a potential to have a single entry at the top of one page. We try to discourage this by increasing the penalty between the leading and trailing backmatter items.

\begin{verbatim}
\newif\ifbackadded
\newcommand*{\l@backmatter}{%
  \ifbackadded\addpenalty{\@highpenalty}\addvspace{1ex \@plus\p@}\else\backaddedtrue\fi
  \\addpenalty{\@highpenalty}\
  \\else\backaddedtrue\\addpenalty{0}\addvspace{1em \@plus\p@}\fi%
  \@dottedtocline{0}{0pt}{0pt}}
\end{verbatim}

\texttt{\texttt{\toclevel@backmatter}} As for the frontmatter handling for the \texttt{hyperref} package, we need to define the heading level of the backmatter items for bookmarks.

\begin{verbatim}
\def{\toclevel@backmatter}{0}
\end{verbatim}

\texttt{\l@figure} Figure and table captions are listed with a single space between each of them. Since table and figure captions have the same format, the \texttt{\l@table} macro is \texttt{\let} from the \texttt{\l@figure} macro.

\begin{verbatim}
\renewcommand*{\l@figure}{%
  \addvspace{10pt}%
  \@dottedtocline{0}{3.2em}}
\end{verbatim}

\begin{verbatim}
\let\l@table\l@figure
\end{verbatim}
Since the *List of Figures*, *List of Tables*, and *List of Musical Examples* all have similar function, the common elements are gathered in this one definition. (This code is borrowed and modified from the report class.)

```
\newcommand{\FSU@lofsomething}{[2]{\FSU@onormalsize%
\if@twocolumn\@restonecoltrue\onecolumn\else\@restonecolfalse\fi
\chapter*{#1}%
\addvspace{-10pt}
\addcontentsline{toc}{frontmatter}{#1}%
\@mkboth{\MakeUppercase{#1}}{\MakeUppercase{#1}}
\@starttoc{#2}%
\if@restonecol	wocolumn\fi}
```

All the hard stuff is done. Now we just define these macros in terms of \FSU@lofsomething.

```
\renewcommand{\listoftables}{\FSU@lofsomething{\listtablename}{lot}}
\renewcommand{\listoffigures}{\FSU@lofsomething{\listfigurename}{lof}}
\newcommand{\listofmusex}{\FSU@lofsomething{\listmusexname}{lom}}
```

### 14 Musical Example Indexing

Here we establish some boiler-plate stuff to hook into the standard \LaTeX mechanisms for table and figure captions, adding a *List of Musical Examples* capability and new environments for their captioning. Musical example captions will be written to a .lom file. The hyperref package, should it be loaded later by the user, expects an additional labeling macro called \theHmusex to be defined.

```
\let\l@musex\l@figure
\newcounter{musex}[chapter]
\renewcommand{\themusex}{\ifnum\c@chapter>\z@\thechapter.\fi\@arabic\c@musex}
\def\fps@musex{tbp}
\def\ftype@musex{1}
\def\ext@musex{lom}
\def\fnum@musex{\musexname\nobreakspace\themusex}
```

These work just like the figure environments.

```
\newenvironment{musex}{\@float{musex}}{\end@float}
\newenvironment{musex*}{\@dblfloat{musex}}{\end@dblfloat}
```

15
15 End Matter Formatting

\refitemsep A new length parameter \refitemsep is created to define the vertical space that
separates individual bibliographic entries. This is calculated from the default
\baselineskip for the selected point size, with a little bit of stretchiness added.
\refindent adjusts the hanging indentation.

\newskip{\refitemsep}
\newskip{\refindent}
\FSU@onormalsize
\global\setlength{\refitemsep}{\baselineskip}
\global\addtolength{\refitemsep}{0pt plus3pt minus0.2pt}
\setlength{\refindent}{2.5em}

references This environment is intended for user-generated formatting of a reference list or
bibliography, i.e., non-BiBiTeX. It establishes single-spaced lines with a blank line
between entries, and the first line of each entry is indented. The page heading
is determined by the current definition of \bibname, not the environment, so the
user must invoke \renewcommand*{\bibname}{References} in order to change
the name of this section.

\newenvironment{references}{\chapter*{\bibname}\FSU@onormalsize}
\interlinepenalty=10000\sloppy
\addvspace{-\baselineskip} \@afterindenttrue
\addcontentsline{toc}{backmatter}{\bibname} \setlength{\leftskip}{\refindent}
\setlength{\parindent}{-\refindent}
\setlength{\parskip}{\refitemsep}
\clearpage

thebibliography This is a re-definition of a BiBiTeX-generated bibliography. We have to be sure
to turn off expanded spacing (if it had been requested), and add an entry to the
ToC.

\renewenvironment{thebibliography}[1]
\FSU@onormalsize
\interlinepenalty=10000\sloppy
\addvspace{-\baselineskip} \@afterindenttrue
\addcontentsline{toc}{backmatter}{\bibname}
\@mkboth{\MakeUppercase\bibname}{\MakeUppercase\bibname}
\f@olist{\@biblabel{\@arabic\c@enumiv}}
\settowidth{\labelwidth}{\@biblabel{#1}}\leftmargin{\labelwidth}
\advance\leftmargin{\labelsep}\@openbib@code\usecounter{enumiv}\let\p@enumiv\@empty
\setlength{\itemsep}{\refitemsep}\setlength{\parsep}{0pt}
\renewcommand{\theenumiv}{\@arabic{\c@enumiv}}
\interlinepenalty=10000\sloppy
\addvspace{-\baselineskip} \@afterindenttrue
\addcontentsline{toc}{backmatter}{\bibname}
\@mkboth{\MakeUppercase\theenumiv}{\MakeUppercase\theenumiv}
\setlength{\itemsep}{\refitemsep}\setlength{\parsep}{0pt}
\renewcommand{\theenumiv}{\@arabic{\c@enumiv}}
\interlinepenalty=10000\sloppy
15.1 Accommodating natbib and apacite

Packages natbib and apacite overwrite our redefinition of the standard \LaTeX \thebibliography environment, so we must accommodate them specially. Further, the apacite package may optionally import the natbib package, so we have to be careful about what we “fix” and under which conditions here. Because these packages will be loaded after this class has been loaded, we must defer our corrections until the preamble has been processed, so once again, we rely on the \AtBeginDocument hook.

\f@plainnat
\bibsection
\bibpreamble
\bibpostamble

We’ll start with the plain natbib corrections. We can accommodate this package by adding definitions to natbib’s \bibsection. There, we’ll set the proper chapter heading, make an addition to the Table of Contents, and reset to single line-spacing. We’ll also add definitions to natbib’s \bibpreamble macro so that we can re-instate the standard \LaTeX list environment, and then restore our own version again by supplementing the definition of \bibpostamble.

\f@apacite
Package apacite has more machinery to adjust, but again, we need to re-instate the \LaTeX default behavior for line spacing and lists for when we may be in expanded mode. We have to make different adjustments if the natbibapa package option has been specified.

\f@apacite
\renewcommand{\bibliographytypesize}{\FSU@onormalsize
\interlinepenalty=10000
\if@expanded\let\f@savenlist=\list\let\list=\f@olist\fi}
\@ifpackageloaded{natbib}{
\renewcommand{\bibsection}{\chapter*{\bibname
\addcontentsline{toc}{backmatter}{\bibname}}
\setlength{\bibsep}{\refitemsep}
\setlength{\bibhang}{\refindent}}
\renewcommand{\bibpreamble}{\f@oldpre\interlinepenalty=10000
\if@expanded\let\list=\f@savenlist\let\f@savenlist=\list\let\list=\f@olist\fi\f@oldpost}
\renewcommand{\bibpostamble}{\f@oldpost}
\setlength{\bibsep}{\refitemsep}
\setlength{\bibhang}{\refindent}
Notes for future consideration: perhaps the changes to the `list` environment should be made a part of the \texttt{FSU@onormalsize} and \texttt{\normalsize} definitions, so that these become effective whenever we enter or leave expanded mode typesetting. Or perhaps our own list environment can just be made sensitive to the current state of \texttt{FSU@onormalsize}/\texttt{\normalsize}.

Now we enfold the corrections into the \texttt{AtBeginDocument} hook.

\begin{verbatim}
\AtBeginDocument{\ifpackageloaded{apacite}{\f@apacite}\ifpackageloaded{natbib}{\f@plainnat}{}}}
\end{verbatim}

\texttt{biosketch} The final page of a thesis or dissertation is the Biographical Sketch. It will be set in expanded spacing (if that document option has been requested).

\begin{verbatim}
\newenvironment{biosketch}{\chapter*{\biosketchname}\normalsize\afterheadadj\addcontentsline{toc}{backmatter}{\biosketchname}}{\clearpage\FSU@onormalsize}
\end{verbatim}

16 Sectioning Command Formatting

\texttt{chapheadskip} The amount of vertical space from the top of the text body area to the top of the chapter heading is defined here by \texttt{chapheadskip}. This value is set here to be 0 inches from the top of the page. If the chapter heading font is changed, this code will need adjustment.

\begin{verbatim}
\newlength{chapheadskip} \sbox{@tempboxa}{\LARGE\bfseries CHAPTER} \setlength{chapheadskip}{0in} \addtolength{chapheadskip}{-\ht@tempboxa} \@makechapterhead \@makeschapterhead
\end{verbatim}

\texttt{\@makechapterhead} \texttt{\@makeschapterhead} Chapter headings are upper-case, centered, LARGE, and bold. Starred chapter headings omit the ‘Chapter/Appendix’ label, and this is used for all the non-chapter page headings in the format.

\begin{verbatim}
\def\@makechapterhead#1{\hrule height0pt depth0pt width0pt\vskip\chapheadskip\centering\parindent=0pt\LARGE\bfseries\ifnum\c@secnumdepth >\m@ne\MakeUppercase{\@chapapp}\space\thechapter\par\nobreak\vskip20pt\fi\interlinepenalty\@M\MakeUppercase{#1}\par\addvspace{40pt}\nobreak}
\end{verbatim}
Chapter sections have centered headings. Subsections are flush left.

These sectioning commands produce in-line headings, and they must end with a period. Rather than relying on the user to consistently provide the period and to remain consistent with other sectioning commands, these macros are re-defined to take an additional argument (i.e., the heading text). This text is normally absorbed by the \@startsection macro, so instead we can tack a period onto the end of the text when we pass control to \@startsection. The downside of the current implementation is that we lose the ability to apply optional arguments for these three sectioning commands.

For the sake of correct PDF bookmarks, hyperref needs a little assistance in this case (because we are creating a bogus heading). We force the current hyper-

16.1 Appendix Handling

FSU likes to have the document appendices labeled as such in the ToC. To accommodate this, we create the \appendixtocname macro (see the “Special Names” section). We also add extra code to the default \appendix macro here to insert an entry into the table of contents using a new “appendix” class.

For the sake of correct PDF bookmarks, hyperref needs a little assistance in this case (because we are creating a bogus heading). We force the current hyper-
We've just defined a new appendix ToC class, so now we need to provide for its format in the ToC. The format below is modified from the default \report class \chapter definition. It would be the same except that we don’t need page numbers, and we want to insert a high penalty after the heading and reduce the vertical space so that it will be attached to the next appendix line should the ToC need to be broken over pages. I have inserted a rather large penalty before the heading to encourage a break there, allowing for the appendix heading and any appendices to float to the next page, along with the back matter material.

\newcommand*{\@appendix}[2]{% 
  \ifnum \c@tocdepth >1\relax 
  \addpenalty{-2000}\vskip 1.0em \@plus\p@% 
  \setlength{\@tempdima}{1.5em}\
  \begingroup
  \parindent \z@ \leavevmode \bfseries
  \advance\leftskip\@tempdima \hskip -\leftskip
  #1\nobreak \hfil \par
  \penalty\@highpenalty\vskip -0.35em\penalty\@highpenalty
  \endgroup
  \fi}
}\toclevel@appendix Set the bookmark level for the appendix heading.
\def\toclevel@appendix{0}

17 Tweaking Captions
\fcapindent The default \report class sets captions with the same margins as the rest of the page body. Instead, we narrow the caption column by the amount \fcapindent. The vertical space below a caption is set by \report to be 0 points, but since captions above tables need some space, we set the value to 10 points here.
\newlength{\fcapindent}
\setlength{\fcapindent}{2em}
\setlength{\belowcaptionskip}{10\p@}
\@makecaption We narrow the caption column by adjusting \leftskip and \rightskip. We also set the text in single-space mode if expanded spacing has been requested. (Small, single-line captions remain centered, as in the default \report class.)
\long\def\@makecaption#1#2{%
  \vskip\abovecaptionskip%
  \sbox{\@tempboxa}{#1: #2}%
  \ifdim \wd\@tempboxa >\hsize

\begin{verbatim}
446  {\advance\leftskip\fcapindent \rightskip=\leftskip\relax%
447  \FSU@onormalsize%
448  #1: #2\par}
449  \else
450  \global \@minipagefalse
451  \hb@xt@\hsize{\hfil\box\@tempboxa\hfil}%
452  \fi
453  \vskip\belowcaptionskip}
\end{verbatim}
Change History

v2.0.0
  General: Initial release of new design. ........................ 1

v2.1.0
  \maketitle: Fixed titling with accented/foreign characters. . . 8

v2.2.0
  \maketitle: Fixed distribution of vertical spacing. .......... 8

v2.3.0
  \if@hyperloaded: Added test for hyperref ........................ 7
  \makecommitteepage: if openright, force recto ..................... 10
  \maketitle: Added pdfbookmark to title page. ..................... 8
  \tableofcontents: Redefined from report class to add pdfbookmark for table of contents ..................... 13
  dedication: if openright, force recto ............................. 12

v3.0.0
  \committeeperson: Removed signature lines for new ETD format. .... 10
  \commskip: Renamed width and skip, removing reference to signatures. .......... 9
  \if@keywords: Explicitly set PDF metadata. ............................ 11
  \makecommitteepage: changed from “Signature Page” to “Committee Page”, removing signature lines and college-level approvals. ..................... 10
  General: Added ifpdf package .... 2
  Added definitions for \subject and \keywords ..................... 7
  Change to FSU Guidelines bumps major version number;
  Enhanced PDF metadata. .......... 1
  \tableofcontents: Prevent entries from being split between pages, restoring default \LaTeX behavior ........................ 13
  \topmargin: Removed the \flushbottom option from the default configuration. .......... 3
  General: Improve handling of long table and figure captions. .... 1

v3.1.0
  \listspenalty: Added new penalty item to allow long captions to be split between pages ..................... 13
  \tableofcontents: Prevent entries from being split between pages, restoring default \LaTeX behavior ........................ 13
  \topmargin: Removed the \flushbottom option from the default configuration. .......... 3
  General: Improve handling of long table and figure captions. .... 1

v3.2.0
  General: Make special accommodations for the optional natbib package. .... 17
  \appendix: Modified standard report macro to insert an extra ToC element ..................... 19
  \appendixtocname: Added a new symbol name to hold the Table of Contents heading for an appendix or appendices. .......... 12
  \l@appendix: New formatting macro for the ToC appendix class ..................... 20
  \l@backmatter: Added a backmatter ToC class to handle References and Biographical Sketch separately from frontmatter .......... 14
  \l@frontmatter: Added test for first frontmatter item to avoid extra vertical space after ToC header ............................. 14
  \maketitle: Added layout for copyright option. .......... 8
  General: Make special accommodations for the optional apacite package. .... 17
  \copyright: Added new document option to add copyright declaration to the title page. . . 2
  \references: Changed \parskip to use \refitemsep. Changed indentation to be consistent with apacite. .......... 16
  \verbatim: Set \verbatim environment to revert to
standard spacing when using
expanded spacing. ............ 6
thebibliography: Set \itemsep to
\refitemsep and set \parsep
to 0pt. ........................ 16
singlespaced: New environment
providing single-spacing. ..... 7
v3.4.0
\chapheadskip: Changed spacing
before chapter header to 0in. . 18
\evenoddoffset: Adjusted text
width for hardcopy option since
the text column is now wider. . 4
\makecommittee: Adjusted
vertical spacing of the
committee page and moved
name column closer to center. 10
\maketitle: Altered spacing for
copyright on title page to be
consistent with
Guidelines 2013 ............... 8
Removed “THE” from
FLORIDA STATE
UNIVERSITY. ............... 8
\textwidth: Set text column to
6.5 inches. .................. 3
v3.5.0
\f@apacite: Added
\interlinepenalty to prevent
page breaks mid-item. ...... 17
\refindent: Increased stretchiness
of \refitemsep to facilitate
un-breakable bibliography
entries ...................... 16
General: Add \interlinepenalty
to prevent page breaks
mid-item. ................... 17
v3.6.0
\maketitle: Removed \semester
element to comply with change
to FSU format. ............... 8
\semester: Made \semester
macro a no-op to comply with
change in FSU format. ........ 8
General: Removed \semester
macro since it’s no longer
needed. ..................... 7
v3.7.0
\dottedtocline: If pagenumbers
exceed the allotted width, use
the natural box width instead
of the predefined width ...... 13
\commskip: Increased the name
column width, moving column
to the left to center it better... 9
\listbaselineskip: New macro to
replace previously hard-coded
value ....................... 5
v3.8.0
\dottedtocline: Added grouping
around \normalcolor
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Numbers written in italic refer to the page where the corresponding entry is de-
scribed; numbers underlined refer to the code line of the definition; numbers in
roman refer to the code lines where the entry is used.

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\ . ........................ 347
\@M ................ 391, 398