The ND**diss**2$_\varepsilon$ class[*]

Sameer Vijay[†]

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Abstract

This ND**diss**2$_\varepsilon$ class is based on the standard LaTeX 2$_\varepsilon$ **book** class and is an extensive rewrite of the earlier **NDthesis** class file, incorporating changes for LaTeX 2$_\varepsilon$ and pdfLaTeX as well as many other improvements. This class conforms with the requirements of the Graduate School guidelines published in Spring 2004 for the layout of the Ph.D. dissertations and Master's theses. In reading this documentation you will find that I assume that the reader has working knowledge of LaTeX 2$_\varepsilon$.

Contents

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[*]Version 3.0, dated 2005/07/27.

[†]Inspiration from an earlier **NDThesis** class by D. A. Peterson

1 Introduction

This document describes the LaTeX 2_ε document class ND**diss**2_ε, suitable[1] for producing dissertations and theses according to the Spring 2004 guidelines of the Graduate School at the University of Notre Dame. The latest version of this class and related documentation should be available at `http://www.gsu.nd.edu` or at `http://graduateschool.nd.edu`.

1.1 Disclaimer

It could be thought of as suspicious if I begin with a disclaimer, but it is important for you to keep in mind that only *You* are responsible for the correct formatting of the document even though use of this class simplifies this task considerably. There are certain formatting things which need to be done manually and are described later in section 5. As such, this class and its associated documentation *must not* be assumed to be a replacement of the formatting guide from the Graduate School and the official guide must be consulted, in case of doubt.

In short, no one but you (the user) accepts any responsibility for works that do not get approved by the Graduate School. Use of the ND**diss**2_ε class file implicitly states acceptance of this policy. Having said that, a document produced by using this class (as described in the following sections) has a pretty good likelyhood of being accepted as it is.

1.2 Dependencies and Limitations

This classfile depends on many other packages to be present in either the `TEXMF` tree (system or local) or the LaTeX search path (defined by shell variable `$TEXINPUTS`). A list of the essential packages is mentioned in section 3.

Although I have tested it with LaTeX [2001/06/01], it should be backwards compatible with LaTeX [1995/12/01] and higher as well. It is not possible for me to list the version of each package used within the class file and you might get errors if the package in your `TEXMF` tree is outdated.

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[1]In my opinion, but with no guarantee that you or other users will agree. I shall not be liable for any consequence, good or bad, of anyone's use of this software.

The classfile is limited in the sense that it will produce an acceptable document with the packages that I have tried and included by default. There are numerous packages you may want to use for your work, but they may have to be modified accordingly. Things lacking include support for subfigure package and proper formatting of the captions in such an environment. Formatting of the captions could be much easier with the new caption[2] in general, and is a thing-to-do for future versions.

2 Usage

The NDdiss2$_\varepsilon$ document class can be used only with LATEX 2$_\varepsilon$ native mode or later, by typing \documentclass[⟨options⟩]{nddiss2e} at the beginning of your LATEX source file. The available options for the use of the class are discussed in section 2.1 below. These have been limited to a small number in order to obtain documents with similar formatting under LATEX 2$_\varepsilon$ using this class, although the NDdiss2$_\varepsilon$ class is based on the book class, which has many other options.

2.1 Options

By default, all documents produced using this class are formatted in letterpaper size and onesided, doublespaced mode, as per the requirements of the Graduate School. If you wish to override these restrictions, appropriate changes to the class file would be needed.

The most important of the options is draft, review or final. Exactly one of these *must* be used, otherwise you would surely get errors.

draft Using draft option will enable the *draft* mode of the book class, thus making the processing of the document faster. As a result of this, the most visible change is that instead of the included figure, only its placement box is displayed. An appropriate header is included to indicate that the prepared document is a draft document. The purpose of the draft option is to obtain a fast and preliminary document showing the labels for citations, tables, figures etc. and a black solid rule highlighting the horizontal overflows. Such a document would be the one you would prepare for revising your text during writing stages.

review The review option makes it possible to prepare a document that is one step closer to the final version. Almost all the formatting of final version is present, along with the labels and keys as in the draft option. A document prepared with review option would be the one to check for proper formatting and giving to your advisor if (s)he wished to suggest corrections.

final The final style option will produce the document for the production of archival copies of the dissertation for submission to the Graduate School.

twoadvisors If you have more than one advisor for your project/research, selecting the twoadvisors option would produce an appropriately formatted titlepage. The \secondadvisor macro command is used to specify the name of the second advisor.

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[2]caption package by Axel Sommerfeldt v3.0b[2004/05/16] and higher

numrefs   Exactly one of these options – `numrefs` or `textrefs`, needs to be specified.
textrefs   `numrefs` results in a numbered citation sytle with natbib and "nddiss2e" citation style file[3]. Using `textrefs` changes the citation style to be similar to "author-date" style with the same files. If none of these options is specified, the default style of numbered citations (ie. same as if `numrefs` was used) is used.

Since the same set of package and style file results in differing citation format, it is *strongly* suggested to refer to the documentation `natnotes.dvi` in your TEXMF tree, to be aware of the various ways in which you can make a citation in your text.

10pt   The choice of the fontsize is only applicable with the `draft` option used. By
11pt   default, the document will be prepared in the 10pt size for the `draft` style option.
12pt   For the `review` and the `final` style options, the document is prepared in the 12pt fontsize and choosing any other fontsize option will be ignored.

noinfo   Using the `noinfo` option would disable the information page produced when the `review` or `final` style options are used. It is recommended that you do not disable the "info" page unless it is the final most copy/copies for submission to the Graduate School.

Thus, `\documentclass[draft,12pt]{nddiss2e}` would produce a document in draft format in 12pt font size and
`\documentclass[final,twoadvisors]{nddiss2e}` would produce a document (with modified title page) for final submission to the Graduate School.

3   Features

A number of packages are required by default and must be present in your TEX search path. As far as possible, these have been tested for proper formatting style with the NDdiss2$_\varepsilon$ class file. The list includes ifthen, exscale, xspace, longtable, indentfirst, tabularx, showkeys, enumerate, latexsym. epsfig, color, graphicx, url, setspace[4], amsmath, amssymb, float, lscape, rotating, booktabs and natbib. I urge you to read the documentation of these packages available in the TEXMF tree, if you think you might use their features or want to tweak some advanced options.

Other packages may or may not be appropriate for use with the NDdiss2$_\varepsilon$ class when producing copies to be submitted to the Graduate School. Please be careful when using packages that change the default fonts, or the layout(s).

In general, the official guidelines of the Graduate School are followed to as much extent as possible. This includes proper formatting of the title page and the abstract page (from the ndthesis package), numbering of the pages in the *frontmatter*, generation of properly formatted table of contents, list of figures etc., as well as bibliography at the end. As per the guide, number of different fonts and font sizes used in the thesis is kept to a minimum. The contents, all lists and the bibliography are single-spaced but the inter-line spacing for the rest of the document is double.

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[3]`nddiss2e.bst` is a slight modificiation of `abbrvnat.bst` in the natbib package
[4]v6.7[2000/12/01] or above

3.1 Generating PDF document

The NDdiss2$_\varepsilon$ class also allows production of pdf documents with pdfLaTeX . In this case, the hyperref and hypernat packages are also required. These packages ensure that the generated pdf document contains internal as well as external links for citations and bookmarks. A document produced by this method also contains embedded fonts (*press quality* pdf) and is suitable for electronic submission to the library and for microfilm archiving. Although the most appropriate options for the hyperref are passed on, for advanced features refer to its documentation.

For creating documents with figures, it is imperative that these are present in a pdf-like format (eg. pdf or metapost) rather than the usual encapsulated postscript (eps) format. An easy way to convert your *eps* files to *pdf* files is to use the utility `epstopdf` or `eps2pdf`, which should be available on your unix-like distribution already.

4 Arrangement of contents

A dissertation or a thesis document must contain the following parts, in the order listed. Only those explicitly marked as optional may be omitted. Again, I must point out that the official guide must be referred and its guidelines override the order listed here.

1. Title Page

2. Copyright page

3. Abstract *(optional for Master's thesis)*

4. Dedication *(optional)*

5. Table of Contents

6. List of Figures

7. List of Tables

8. List Symbols *(optional)*

9. Preface *(optional)*

10. Acknowledgments *(optional)*

11. Text

12. Appendix (or Appendices) *(optional)*

13. Bibliography (or References, or Works cited)

The macros and environments described below ease the formatting of these parts.

4.1 Title page

The title page is generated by the standard LaTeX macro `\maketitle` with no arguments. This macro has been modified for providing a title page format required for dissertations/theses.

Prior to invoking it in your document, you should declare –

`\title{}` • the title of the document using the `\title` macro (note: title must be in ALL caps, eg. `\title{THIS IS \\ A TITLE IN TWO LINES}`, and you may use linebreaks within the title),

`\author{}` • your name (full and exactly as registered with the Graduate School) with the `\author` macro, (eg. `\author{Gary Graham Gordon-Graeme}`),

`\work{}` • whether the document is a *Thesis* or a *Dissertation* as argument of `\work` macro, (eg. `\work{Dissertation}`),

`\degaward{}` • the degree you're aiming for (in full) with the `\degaward` macro, (eg. `\degaward{Doctor of Philosophy}` or `\degaward{Master of Science\\in\\Engineering}`),

`\degprior{}` • all your prior degrees to go with your name with `\degprior` macro, (eg. `\degprior{B. S., M. S.}`),

`\advisor{}` • the name of your advisor as argument to `\advisor` macro,

`\secondadvisor{}` • the name of second advisor, if any, with `\secondadvisor` macro [5],

`\department{}` • the name of the department in the argument of the `\department` macro, (eg. `\department{Gnulogical Engineering}`) and,

`\degdate{}` • the month and year of the defense of the thesis with the `\degdate` (eg. `\degdate{June 2004}`). If you forget to declare this, the current month/year combination will be automatically used.

`\maketitle`   After defining the above macro arguments, use `\maketitle` to generate a title page, which includes your entries. All the above macros are required and if missing, they may result in errors in the generation of the title page.

4.2 Copyright page

`\makecopyright`
`\makepublicdomain`   The `\makecopyright` macro should be invoked after `\maketitle` to produce a copyright page. Alternatively, you can use `\makepublicdomain` to produce a page with the message "This document is in the public domain." Note that the absence of the copyright page does *not* place your dissertaion in the public domain, you must declare it as such explicitly.

`\copyrightholder{}`
`\copyrightyear{}`   Prior to calling `\makecopyright`, you may specify a different name for the copyright holder (the default is the name given through the `\author` macro) and for the copyright year (the default being the current year). You should do this with `\copyrightholder{⟨name⟩}` and `\copyrightyear{⟨year⟩}` macros.

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[5]this macro is necessary when, twoadvisors option is used while invoking NDdiss2ε class

4.3 Abstract page(s)

abstract

The abstract environment has been modified from the default in the report class to comply with the requirements of the Graduate School. The abstract text should be placed between `\begin{abstract}` and `\end{abstract}`. In this environment, the author's name is placed in the top-right header, if it exceeds one page.

\abstractname{}

You may use `\abstractname{`⟨*text*⟩`}` to change the abstract caption to text. Default name: `Abstract`.

4.4 Dedication

dedication

The format of dedication is essentially free, but you may want to use the dedication environment for this purpose. This environment will center the text of your dedication vertically on the page. The dedication is optional. `\dedicationname{`⟨*text*⟩`}` may be used to change the title for the dedication page. Default name: `\mbox{}` ie. an empty title.

\dedicationname{}

4.5 Table of contents, figures and tables

\tableofcontents
\listoffigures
\listoftables

Use the macros `\tableofcontents`,`\listoffigures` and `\listoftables` in this order, to produce the required table of contents and list of figures and tables. (Note: the "list of figures" should precede the "list of tables" as per the Graduate School guide)

\contentsname{}
\listfigurename{}
\listtablename{}

The macros `\contentsname`, `\listfigurename` and `\listtablename` may be used to change the caption for Table of Contents, List of Figures and List of Tables, respectively. By default, they are named as `CONTENTS`, `FIGURES` and `TABLES`.

4.6 List of symbols

symbols

The symbols environment is useful in formatting the list of symbols/abbreviations used in your work. It takes optional argument specifying the desired format, eg. `\begin{symbols}[cl]` for first column centered and the next column aligned left. As earlier, the caption for the list of symbols can be changed by using the `\symbolsname` macro. Default name: `SYMBOLS`

\symbolsname{}

\sym{}{}

Another macro `\sym{`⟨*symbol*⟩`}{`⟨*definition*⟩`}` makes the task of entering the symbols and their meanings in the symbols environment easier. `\sym` takes two arguments - first, a math "object" and second, assumed to be the plain text describing the symbol. Any plain text in the first argument needs to be set with `\mathrm{..}` and any math symbol in the second needs to placed in `$..$`. Example: `\sym{\beta_\mathrm{norm}}{Definition for $\beta$}`

4.7 Preface

preface
\prefacename{}

An environment preface is provided for formatting the preface to the document. The name of this *chapter* may be changed by `\prefacename` macro. Default name: `PREFACE`

4.8   Acknowledgments

<div style="float:left">acknowledgments
\acknowledgename{}</div>

The environment `acknowledgments` is used to format the acknowledgment *chapter*. As above `\acknowledgename` macro may be used to change the title name. Default name: `ACKNOWLEDGMENTS`.

4.9   Text

<div style="float:left">\mainmatter</div>

Use the macro `\mainmatter` at the beginning of the text sections ie. all text matter should follow this macro as in the `book` class. The text is formatted in `\normalspacing` ie. double-spacing. The pages are numbered in `plain` pagestyle such that the page numbers are centered in the bottom. The `chapter` titles can be multi-line or long and would be formatted doubly spaced.

4.10   Appendix

<div style="float:left">\appendix</div>

As in the `book` class, use the `\appendix` to mark the end of the last chapter in the main section and the start of the appendices. To begin an appendix, using a `\chapter{⟨title⟩}` macro. Appendices will be automatically "numbered" alphabetically.

4.11   Backmatter

<div style="float:left">\backmatter</div>

This macro separates the bibliography, index and glossary from the main matter and appendices, if any.

4.12   Bibliography

<div style="float:left">\bibliography</div>

You may use the `\bibliography{⟨bibfile⟩}` macro to generate the bibliography with BibTeX. In order to use the BibTeX path for generating bibliography, one needs to have all the bibliographic data in BibTeX files. You should refer to BibTeX manual for details about making a `.bib` file and format for the entries.

<div style="float:left">\bibname{}</div>

The default name for this *chapter* is `BIBLIOGRAPHY`. You may change it by using the macro command `\bibname{⟨newbibname⟩}`.

<div style="float:left">thebibliography</div>

Alternatively, you can also make your own bibliography by using thebibliography environment. In this case, you would have to write the reference entries in the right format in your `.tex` source file itself.

For citing references in the text, the package natbib is included with options: `numbers,sort&compress` (`numrefs` option) or `authoryear,sort` (`textrefs` option). The package natbib is a fantastic package that has numerous macros for *citing* in different ways. It would make your life a lot easier if you read up its documentation. In addition, for generation of pdf document, another package hypernat helps generates internal links for references.

Warning: The packages cite and citation are NOT compatible with the natbib package, and they must not be used.

5 Note for the authors

As noted earlier, the dissertation author must make sure that the following conditions are met in order to generate a dissertation acceptable by the Graduate School:

- List of Figures should be *before* List of Tables, ie. the macro command `\listoffigures` comes before `\listoftables` in the frontmatter.

- Chapter titles need to be written in ALL CAPS.

- Table caption must be *above* the table, but the figure caption should be *below* it. In case of `table` environment, this can be achieved by putting `\caption` before you include the table (eg. in a `tabular` environment). In the `figure` environment, `\caption` goes after the `\includegraphics` macro command.

- Table captions need to be in ALL CAPS as well.

- Bibliography is the last section/chapter of the thesis.[6]

5.1 Chapter-wise bibliography

It is now possible to obtain bibliography as a section in each chapter (as is common in some departments esp. humanities) with some minor code implementation in the `.tex` files. To do this you have to load the package `chapterbib` (without any options) in the preamble of your main tex file and redefine some commands as below -

```
%% Main source file %%
\documentclass[...]{nddiss2e}
\usepackage{chapterbib}
\renewcommand{\bibname}{Cited works}
\renewcommand{\bibsection}{\section{\bibname}}
...
\begin{document}
\include{chptr1}
...
\include{appndx}
\end{document}
```

In such a case, you must separate the chapters or sections in which you want individual bibliographies in different files and *include* them in the main file as above. Each such `\include`d file must contain its own `\bibliographystyle{nddiss2e}` and `\bibliography{...}` command at an appropriate position. There should not be any bibliographic commands in the main source file.

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[6]Except if you are using *chapter-wise* bibliography

After compiling the main tex file once (with `latex` or `pdflatex`)[7], you would have to run `bibtex` on each of the separate files to obtain a `.bbl` for each file. The remaining steps are the same as for a normal `.tex` file.

You can find more details of this in the `natbib` manual (`natbib.dvi`) in the `TEXMF` tree.

5.2   Tips and suggestions

- Use `\toprule`, `\midrule` and `\bottomrule` macro commands (from the booktabs package) in the tables for generating the appropriate horizontal rules. Use of vertical rules to separate columns in tables, is in general, bad style and should be avoided as much as possible.

- Use the longtable environment for handling very long tabular materials. Again, use the vertical rules only if very necessary.

```
\begin{longtable}{lc}
\caption[]{LONG TABLE CAPTION \label{tab:longtable} }
\toprule
Heading 1 & Heading 2 \\
\midrule
\endfirsthead
\caption[]{ {\em Continued} } \\
\midrule
Heading 1 & Heading 2 \\
\midrule
\endhead
\endfoot
\bottomrule
\endlastfoot
% Now the tabular material %
Long & Table etc. \\
\end{longtable}
```

- If a figure/table is very wide and will not fit normally, use the landscape environment (from the included lscape package) to format them in *landscape* mode. They will automatically appear on a separate page. The sidewaystable environment (from the included rotating package) is incompatible with the current class and must be avoided.

- Usually the width of the figure/table captions is 90% of the textwidth (ie. `0.9\textwidth`), but if needed can be changed as per the following:

    - Use a minipage environment of appropriate width and enclose your tabular or figure float inside it, or

---

[7]This creates `.aux` files which are needed by `bibtex`

– set the `\capwidth` inside the table or the figure environment, and `\LTcapwidth` *outside* the longtable environment, e.g.,

```
\begin{table}[H]
\setlength{\capwidth}{0.8\textwidth}
\centering                              \setlength{\LTcapwidth}{6in}
\caption{TABLE CAP\label{tab:this}}     \begin{longtable}{lccc}
\begin{tabular}{lc}                     ...
...                                     \end{\longtable}
\end{tabular}
\end{table}
```

- Use tabularx environment for the actual formatting of the tables (within the table environment). It differ slightly from tabular environment and you should refer to their documentation in the TEXMF tree for more information.

- If you've used a longtable environment in your document, it might be necessary to compile the document multiple times so as to get proper alignment of columns. This is documented in the longtable manual.

- If you wish to use `\footnotes` in the longtable environment, please read its documentation. There are some handicaps present.

- A new macro command `\subsubsection` (self-explanatory) has been defined. It is numbered as `3.2.1.4` in the TOC.

- To cite a website in your bibliography[8], use the following format in your `.bib` file:

```
@Misc{fairley2000,
author =        "N. Fairley",
title =         "Casa{XPS} {VAMAS} processing software",
howpublished = "Website",
note =          "\url{http://www.casaxps.com}",
}
```

This when processed with the `nddiss2e.bst` citation style file gives:
111. N. Fairley. CasaXPS VAMAS processing software. Website. `http://www.casaxps.com`.

5.3   You found errors?

If you find some errors in formatting of your document, most likely these are NOT due to the NDdiss2$_\varepsilon$ class, but due to either wrongly used commands/macros or conflicting commands/macros in a package that you might have used ie. a mistake

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[8]More info at `http://www.tex.ac.uk/cgi-bin/texfaq2html?label=citeURL`

from your side. Please verify that before contacting anyone regarding the class file.

Read the manuals for the packages that you might have used and find out if they have macro commands that modify the page-layout, spacing etc. or if they conflict with already defined commands (eg. packages natbib and cite redefine the same command \cite in different ways). I would suggest that you *read the manuals anyway*! It is a good practice.

In the possible scenario that you have found a significant error, please try to find out the source of the error and, even better, a possible alternative, please report it to the Graduate School's reviewer(s). It would also be great, if you try to find a solution for the problem and inform that as well. Please also inform if you find this documentation confusing or misleading or if any mistakes are present.

Your doing so will ensure that the reviwer(s) are aware of the problem and its possible solutions and they can give better answers to the people who might encounter similar problems. It will also help making the future versions of the class file better.

6 Example

Below is a basic `.tex` sample for your help. A file called `template.tex`[9] is generated from `nddiss2e.ins` which might serve as a guide for your document. The `example` directory contains a mock thesis modified from `ndthesis` classfile and should also be helpful.

```
\documentclass[numrefs,final]{nddiss2e}

\begin{document}

\frontmatter

\title{}
\author{}
\work{Dissertation}
\degprior{B.S., M.S.}
\degaward{Doctor of Philosophy}
\advisor{}
\department{}
\maketitle
\makepublicdomain

\begin{abstract}
Abstract here
\end{abstract}
\renewcommand{\dedicationname}{\mbox{}}% Empty dedication title
\begin{dedication}
For Someone
```

---

[9]Most likely present in the same directory as `nddiss2e.cls` ie. in `TEXMF/tex/latex/nddiss2e/`

```latex
\end{dedication}

\tableofcontents
\listoffigures
\listoftables

\begin{preface}
Preface here
\end{preface}
\begin{acknowledge}
Thanks to everyone
\end{acknowledge}
\begin{symbols}
\sym{a}{definition of a}
\end{symbol}

\mainmatter

\chapter{One} % Chapter 1
All the text ...

\appendix
\chapter{Additional data} % Appendix A

\backmatter
\bibliographystyle{nddiss2e}
\bibliography{bibdatabase}

\end{document}
```

7   The Implementation

Following is my attempt at documenting the source of the NDdiss2$_\varepsilon$ class file for the TEX hackers.

At start, we define the base version of LATEX 2$_\varepsilon$ needed and the label information for the NDdiss2$_\varepsilon$ class.

```
1 \NeedsTeXFormat{LaTeX2e}[1999/12/01]
2 \ProvidesClass{nddiss2e}
3     [2005/07/27 v3.0 ^^J%
4        Notre Dame Dissertation document class by Sameer Vijay^^J]
5 %
```

\dissfileversion   The \dissfileversion and \dissfiledate macros contain the version and the date of
\dissfiledate   the release.

```
6 \providecommand{\dissfileversion}{3.0}
7 \providecommand{\dissfiledate}{2005/07/27}
8 %
```

New boolean variables for the options used in NDdiss2$_\varepsilon$ class are set here with default values.

```
 9 \newif\ifdiss@draft            \diss@drafttrue
10 \newif\ifdiss@review           \diss@reviewfalse
11 \newif\ifdiss@final            \diss@finalfalse
12 \newif\ifinfo@page             \info@pagetrue
13 \newif\ifadvisors@two          \advisors@twofalse
14 \newif\ifdiss@dedication       \diss@dedicationfalse
15 \newif\ifnum@refs              \num@refstrue
16 \newif\ifcentered@chaptitle    \centered@chaptitletrue
17 %
```

draft   Exactly one of these options must be present in order to get a proper document. These
review   options set appropriate boolean variables (flags) and pass some common options to the
final   parent book class.

```
18 \DeclareOption{draft}{
19     \setlength\overfullrule{5pt}
20     \typeout{DRAFT MODE}\typeout{}\info@pagefalse%
21     \diss@drafttrue\diss@reviewfalse\diss@finalfalse
22     \PassOptionsToClass{letterpaper,oneside,draft}{book} }
23 %
24 \DeclareOption{review}{
25     \typeout{REVIEW MODE}\typeout{}\info@pagetrue%
26     \diss@draftfalse\diss@reviewtrue\diss@finalfalse
27     \PassOptionsToClass{12pt,letterpaper,oneside,final}{book} }
28 %
29 \DeclareOption{final}{
30     \setlength\overfullrule{0pt}
31     \typeout{FINAL MODE}\typeout{}\info@pagetrue%
```

```
32        \diss@draftfalse\diss@reviewfalse\diss@finaltrue
33        \PassOptionsToClass{12pt,letterpaper,oneside,final}{book} }
34 %
```

numrefs
textrefs

The options `numrefs` or `textrefs` selects appropriate citation style ie. "numbered" or "textual", respectively. By choosing `textrefs`, one can get "author-date" style of citation in the text. The default is `numrefs`.

```
35 \DeclareOption{numrefs}{
36    \typeout{NUMBERED REFERENCES}\num@refstrue}
37 \DeclareOption{textrefs}{
38    \typeout{TEXTUAL REFERENCES}\num@refsfalse}
```

The option `nocenter` (not documented) allows non-centered chapter titles.

```
39 \DeclareOption{nocenter}{\centered@chaptitlefalse}
40 %
```

The `openbib` option (not documented) is useful in creating indented bibliography. Usually you would not need to use this option since the default layout of the `bibliography` is very much acceptable.

```
41 \DeclareOption{openbib}{%
42    \PassOptionsToPackage{openbib}{natbib}
43 }
44 %
```

The other options are declared in the following lines.

twoadvisors

The `twoadvisors` option sets the flag for modifying the layout of the title page.

```
45 \DeclareOption{twoadvisors}{\typeout{TWO ADVISORS}\typeout{}%
46    \advisors@twotrue}
47 %
```

10pt
11pt
12pt

The options `10pt`, `11pt` or `12pt` are appropriately passed on to the `book` class depending on whether `\diss@draft` flag is set true.

```
48 \DeclareOption{10pt}{%
49  \ifdiss@draft%
50   \PassOptionsToClass{10pt}{book}%
51  \else%
52   \OptionNotUsed%
53   \ClassWarningNoLine{nddiss2e}%
54     {Font size 10pt not allowed; using 12pt}%
55  \fi%
56 }
57 \DeclareOption{11pt}{%
58  \ifdiss@draft%
59   \PassOptionsToClass{11pt}{book}%
60  \else%
61   \OptionNotUsed%
62   \ClassWarningNoLine{nddiss2e}%
63     {Font size 11pt not allowed; using 12pt}%
64  \fi
65 }
```

```
66 \DeclareOption{12pt}{%
67    \PassOptionsToClass{12pt}{book}%
68 }
69 %
```

```
70 \DeclareOption{noinfo}{\info@pagefalse}
71 %
```

The **twoside** option (not documented) is when you want to prepare a two-sided document for your own use. The only difference from the one-sided document is in the page layout. This option is passed on to the parent **book** class.

```
72 \DeclareOption{twoside}{\typeout{TWO SIDED DOCUMENT}%
73    \PassOptionsToClass{twoside}{book} }%
74 %
```

All options other than those defined above are ignored and a warning is printed on the screen during compile-time. After processing all the options, the **book** class is loaded with the specified options.

```
75 \DeclareOption*{\ClassWarning{nddiss2e}%
76       {UnknownOption '\CurrentOption'} }%
77 \ProcessOptions\relax
78 \LoadClass{book}
79 %
```

At this stage, the packages **ifthen**, **exscale**, **ifpdf**, **longtable**, **xspace**, **indentfirst**, **tabularx**, **enumerate** and **latexsym** are loaded. It is important to load these in specific order so as not to cause conflicts in definitions of certain macros.

```
80 \RequirePackage{ifthen,exscale}
81 \RequirePackage{ifpdf}
82 \RequirePackage{longtable}
83 \RequirePackage{xspace}
84 \RequirePackage{indentfirst}
85 \RequirePackage{tabularx}
86 \RequirePackage{enumerate}
87 \RequirePackage{latexsym}
88 %
```

If the `\diss@final` is set false (when using `draft` or `review` option) then **showkeys** package is also loaded.

```
89 \ifdiss@final\relax\else\RequirePackage{showkeys}\fi
90 %
```

Depending in whether you are using pdfLATEX or plain LATEX , **epsfig**, **color** and **graphicx** are loaded with respective options. Additionaly when using pdfLATEX , the package **hyperref** (for internal/external links in the document) is also loaded. The options for this package have been tested to produce a document which can be printed on laser printers without any problems because of colored link boxes.

```
91 \ifpdf
92    \RequirePackage[pdftex]{epsfig}
93    \RequirePackage[pdftex]{color}
94    \RequirePackage[pdftex]{graphicx}
95    \RequirePackage[pdftex,
```

```
96              letterpaper=true,%
97              bookmarks=true,%
98              bookmarksnumbered=true,%
99              linktocpage=true,%
100             breaklinks=true,%
101             bookmarkstype=toc,%
102             colorlinks=false,%
103             pdfpagemode=UseOutlines]{hyperref}
104   \AtBeginDocument{
105   \pdfadjustspacing=1
106   }
107 \else
108   \RequirePackage[dvips]{epsfig}
109   \RequirePackage[dvips]{color}
110   \RequirePackage[dvips]{graphicx}
111 \fi
112 %
```

Now the natbib package is loaded with its options, appropriate to numrefs or textrefs class option. If numrefs is specified, then natbib is read-in with its options for "numbered" references and sorted & compressed (eg. [3-6,8-10]). In this case, the default delimiter is square brackets and the default seperator is a comma. For the textrefs option, the natbib package is read-in so as to sort the references in an "author-date" style of citations. The default delimitor and separator, in this case, are round brackets and colon, respectively.

For creating internal links in a pdf document with pdfLATEX , the package hypernat is also loaded.

```
113 \ifnum@refs
114   \RequirePackage[numbers,sort&compress]{natbib}
115 \else
116   \RequirePackage[authoryear,sort]{natbib}
117 \fi
118 %
119 \ifpdf
120     \RequirePackage{hypernat}
121 \fi
122 %
```

Additionaly, the packages amsmath, amssymb, float, lscape, booktabs, rotating, url and setspace are loaded when (pdf)LATEX processes \begin{document}. Again, the order of these packages is important.

```
123 \AtBeginDocument{
124 \RequirePackage{amsmath,amssymb}
125 \RequirePackage{float}
126 \RequirePackage{lscape}
127 \RequirePackage{booktabs}
128 \RequirePackage{rotating}
129 \RequirePackage{url}
130 \RequirePackage[doublespacing]{setspace}[2000/12/01]
131 }
132 %
```

Set the `\pagestyle` for the document to `plain` here and define default spacing.

```
133 \AtBeginDocument{
134 \pagestyle{plain}
135 \normalspacing
136 \typeout{Pagestyle and spacing normal}
137 }
138 %
```

Here, define some spacing macros for page layout and doublespacing.

```
139 \newcommand{\normalspacing}{\doublespacing}
140 \newcommand\single@baselinestretch{1.0}
141 \newcommand\double@baselinestretch{1.66}
142 \newlength{\single@skip}
143 \setlength{\single@skip}{\single@baselinestretch em}
144 \newlength{\double@skip}
145 \setlength{\double@skip}{\double@baselinestretch em}
146 %
```

Define new lengths for some variables for a proper layout of normal pages, pages with text and figures and pages with only floats.

```
147 \setlength{\hoffset}{0pt}
148 \setlength{\voffset}{0pt}
149 \addtolength{\topmargin}{-32pt}
150 \setlength{\headsep}{12pt}
151 \setlength{\marginparwidth}{54pt}
152 \setlength{\marginparsep}{0pt}
153 \addtolength{\textheight}{63pt}
154 \addtolength{\textwidth}{26pt}
155 \setlength{\oddsidemargin}{36pt}
156 \setlength{\evensidemargin}{18pt}
157 \setlength{\footskip}{36pt}
158 %
159 \setlength{\floatsep}{30pt}
160 \setlength{\intextsep}{50pt}
161 %
162 \newcommand{\clearemptydoublepage}{\newpage{\pagestyle{empty}%
163     \cleardoublepage}}
164 %
```

`\nddiss` Define the macro `\nddiss` that is the logo used in the titlepage and the stamp in the dissertation document.

```
165 \DeclareRobustCommand{\nddiss}{%
166         \textsf{{\scshape nd}diss}\kern-0.03em%
167         2$_\mathsf{\textstyle\varepsilon}$}
168 %
```

`\work` Here define new macros for use in the dissertation title page.
`\degaward`
`\degprior`
`\advisor`
`\secondadvisor`
`\department`
`\degdate`

```
169 \newcommand{\work}[1]{\def\@work{#1}}
170 \newcommand{\degaward}[1]{\def\@degaward{#1}}
171 \newcommand{\degprior}[1]{\def\@degprior{#1}}
```

```
172 \newcommand{\advisor}[1]{\def\@advisor{#1}}
173 \ifadvisors@two
174    \newcommand{\secondadvisor}[1]{\def\@secondadvisor{#1}}
175 \fi
176 \newcommand{\department}[1]{\def\@department{#1}}
177 \newcommand{\degdate}[1]{\def\@degdate{#1}}
178   \degdate{\ifcase\month\or
179     January\or February\or March\or April\or May\or June\or
180     July\or August\or September\or October\or November\or December\fi
181     \space\number\year}
182 %
```

As a default, these macros have an empty arguement. Only the \degdate macro takes
on the current month-year combination in the absence of any assignation.

```
183 % Defaults are empty except the \degdate
184   \title{}
185   \author{}
186   \work{}
187   \degaward{}
188   \degprior{}
189   \advisor{}
190   \ifadvisors@two \secondadvisor{} \fi
191   \department{}
192 %
```

\@infopage   Define \@infopage macro that will create a page which contains important information
about the document and the version of NDdiss2$_\varepsilon$ used etc. for the end-user and the
proofreader along with a standard disclaimer and details of where to find documentation
for the NDdiss2$_\varepsilon$ class file. This information can be suppressed by specifying "noinfo"
option while invoking the NDdiss2$_\varepsilon$ class.

```
193 \DeclareRobustCommand{\@infopage}{
194   \thispagestyle{empty}
195   \null\vspace*{\single@skip}
196   \begin{center}
197   \large This \@work\space \\ entitled \\ \@title \\
198       typeset with \nddiss\ v%
199       \dissfileversion\ (\dissfiledate) %
200       on \today\space for\\
201   \@author\\
202   \end{center}
203
204   \normalfont\normalsize\singlespacing
205
206   \noindent This \LaTeXe\space classfile conforms to the
207   University of Notre Dame style guidelines established in
208   Spring  2004. However it is still possible to generate a
209   non-conformant document if the instructions in the class
210   file documentation are not followed!
211
212   \begin{center}
```

```
213    \begin{minipage}{0.75\textwidth}
214    \noindent Be sure to refer to the published Graduate
215    School guidelines at \url{http://graduateschool.nd.edu}
216    as well. Those guidelines override everything mentioned
217    about formatting in the documentation for
218    this \nddiss\space class file.
219    \end{minipage}
220    \end{center}
221
222    \noindent It is YOUR responsibility to ensure that the Chapter titles
223    and Table caption titles are put in CAPS LETTERS. This classfile does
224    {\em NOT\space} do that! \\
225
226    \noindent\itshape This page can be disabled by
227    specifying the ``{\upshape\ttfamily noinfo}'' option to the class invocation.
228    \upshape
229 (i.e.,{\ttfamily{\textbackslash}documentclass[\ldots,noinfo]\{nddiss2e\}})
230 )
231    \begin{center}
232      {\bfseries\large\singlespacing This page is \slshape NOT
233      \upshape part of the dissertation/thesis, but MUST be turned in to the
234      proofreader(s) or the reviwer(s)!}
235    \end{center}
236      \normalsize\normalfont
237      \nddiss\ documentation can be found at these locations:
238    \begin{center}
239      \url{http://www.gsu.nd.edu}\\
240      \url{http://graduateschool.nd.edu}
241    \end{center}
242
243 \vfill
244 \normalfont\normalsize\normalspacing\eject}
245 %
```

\maketitle   Redefine the macro **\maketitle** to produce the information page as well as the actual title page of the dissertation.

```
246 \renewcommand{\maketitle}{
247    \ifinfo@page\@infopage\else\relax\fi%
248    \clearemptydoublepage
249    \normalfont\normalsize\normalspacing
```

titlepage   The structuring begins with checking the proper macros for obtaining a correct formatting for the title page. If any of those are not defined, an error is issued and processing stopped. Most of the code for this was taken from the earlier ndthesis class and hence, the documentation is also picked from there.

```
250    \begin{titlepage}%
251 \ifthenelse{\equal{\@work}{}}{\ClassError{nddiss2e}%
252    {The \protect\work\space macro is undefined.\MessageBreak
253         The title page may be incorrectly formatted.}%
254    {Specify \protect\work\space as Dissertation or Thesis}}{\relax}
```

```
255 \ifthenelse{\equal{\@degaward}{}}{\ClassError{nddiss2e}%
256   {The \protect\degaward\space macro is undefined.\MessageBreak
257         The title page may be incorrectly formatted.}%
258   {Specify \protect\degaward\space. It defines the awarded degree%
259          (Ph.D., M.S., etc.)}}{\relax}
260 \ifthenelse{\equal{\@advisor}{}}{\ClassError{nddiss2e}%
261   {The \protect\advisor\space macro is undefined.\MessageBreak
262         The title page may be incorrectly formatted.}%
263   {Spepcify \protect\advisor\space It is who signs your walking papers!}}{\relax}
264 \ifthenelse{\equal{\@department}{}}{\ClassError{nddiss2e}%
265   {The \protect\department\space macro is undefined.\MessageBreak
266         The title page may be incorrectly formatted.}%
267   {Specify which \protect\department\space is awarding your degree?}}{\relax}
268 \ifadvisors@two
269   \ifthenelse{\equal{\@secondadvisor}{}}{\ClassError{nddiss2e}%
270   {The \protect\secondadvisor\space macro is undefined.\MessageBreak
271             The title page may be incorrectly formatted.}%
272   {Use \protect\secondadvisor\space for your second advisor}}{\relax}
273 \fi
274 %
```

Now set up some skip registers to hold the inter-data spacing. The initial values will vertically center the title page provided the title is only one line long. We'll account for the longer ones in a bit ...

```
275 \skip1=1.2\double@skip
276 \skip2=1.7\double@skip
277 \skip3=2.7\double@skip
278 \skip4=1em
279 %
```

If the author has two advisors, we need to do a little tweaking.

```
280 \ifadvisors@two \skip1=1.0\double@skip \skip4=1.5em \else\relax\fi
281 %
```

For positioning the title, we first stuff it in a box and find out how many lines it will occupy. In order to maintain the $1''$ top margin required by Notre Dame, we must not move our defaults up by more than one-half of a \doubleskip. (Actually, there's a bit more room than that, but we reserve that space in the case of multiple advisors.) As it turns out, if the title is just two lines long, then just moving the top of the text by .5\doubleskip will cause it to remain centered. For longer titles, the extra lines have to be taken out of the inter-section spacing (skip register 1).

```
282 \setbox0=\hbox{\@title}
283 \ifdim \wd0 > 3\hsize
284    \advance\skip4 .5\double@skip
285    \advance\skip1 -.33\double@skip
286 \else
287    \ifdim \wd0 > 2\hsize
288      \advance\skip4 .5\double@skip
289          \advance\skip1 -.167\double@skip
290    \else
291      \ifdim \wd0 > \hsize
```

```
292          \advance\skip4 .5\double@skip
293              \fi
294    \fi
295  \fi
296  %
```

Our default assumes a two-line degree field such as

<div align="center">

Doctor of Philosophy
in Somekind of Science

</div>

but we check to see if it is simply one line long. If so, we need to add-back that extra line to the spacing.

```
297  \setbox1=\vbox{\@degaward}
298  \ifdim \ht1 > \double@skip\relax
299      \else \advance\skip1 .167\double@skip \fi
300  %
```

Finally we start putting the text in place . . . centered, of course.

```
301    \null\vspace*{-\skip4}
302    \begin{center}%
303      \@title \par%
304      \vskip\skip1%
305  %
```

Now skip the required vertical space, declare that this is for the University of Notre Dame, and list what degree has been earned.

```
306      A \@work \par%
307      \vskip\skip1%
308        Submitted to the Graduate School \\
309            of the University of Notre Dame \\
310            in Partial Fulfillment of the Requirements \\
311            for the Degree of \par
312        \vskip\skip1%
313        \@degaward%
314        \vskip\skip1%
315        by%
316        \vskip\skip1%
317  %
```

Now format the author's name and credentials.

```
318      {\normalsize
319        \begin{tabular}[t]{c@{}l}%
320          \@author, &\ \@degprior
321        \end{tabular}\par }%
322  %
```

Now skip the proper space and place the signature line for the advisor with his/her name typeset below it. This is accomplished by essentially centering a box that is twice as long as the required length of the signature line and placing the line in only the right-hand side.

```
323        \ifadvisors@two
324            \vskip\skip2\else
```

```
325          \vskip\skip3\fi%
326          \hspace*{2.75in}\underline{\hspace{2.75in}}\\%
327          \hspace*{2.75in}\@advisor, Director\\
328 %
```

If there is a second advisor, place that line here now.

```
329 \ifadvisors@two %
330          \vskip\double@skip%
331          \hspace*{2.75in}\underline{\hspace{2.75in}}\\%
332          \hspace*{2.75in}\@secondadvisor, Director\\
333 \fi
334 %
```

Finally, we do a vertical fill to get the department and date to the page bottom.

```
335     \vskip\skip1%
336     Graduate Program in \@department \\%
337     Notre Dame, Indiana \\
338     \@degdate
339     \end{center}
340     \end{titlepage}%
341 }
342 %
```

copyrightpage   The environment `copyrightpage` defines the defaults for proper formatting the copyright page (if opted).

```
343 \newenvironment{copyrightpage}{%
344     \clearemptydoublepage
345     \typeout{Copyleft page}
346     \pagestyle{empty}
347     \null\vfil
348     \begin{center}\normalspacing}%
349 { \end{center}\vfil\null \clearpage }
350 %
```

\copyrightholder   Define a few macros for defining the copyright holder and the year desired. By default,
\copyrightyear   they are taken as the current year and the `author` of the dissertation.

```
351 \newcommand{\@copyrightyear}{\year}
352 \newcommand{\@copyrightholder}{\@author}
353 \newcommand{\copyrightyear}[1]{\renewcommand{\@copyrightyear}{#1}}
354 \newcommand{\copyrightholder}[1]{\renewcommand{\@copyrightholder}{#1}}
355 %
```

\makecopyright   Finally, the `\makecopyright` macro creates the copyright page as per defined in the `copyrightpage` environment.

```
356 \newcommand{\makecopyright}{%
357     \ifdiss@final
358         \begin{copyrightpage}
359         \normalfont\normalsize
360         \copyright\space Copyright by \\
361         \@copyrightholder \\
362         \@copyrightyear\\
```

```
363    All Rights Reserved \\[10mm]
364    \end{copyrightpage}
365  \fi
366 }%
367 %
```

\makepublicdomain Or, if chosen, \makepublicdomain macro creates a copyright page (using earlier copyrightpage environment) that puts the document in public domain.

```
368 \newcommand{\makepublicdomain}{%
369  \ifdiss@final
370    \begin{copyrightpage}
371       This document is in the public domain.
372    \end{copyrightpage}
373  \fi
374 }%
375 %
```

Define some new name macros and redefine other name macros as below. These are the names of the respective sections in your dissertation document. If there's a need to change any name, you must use a similar command in the preamble of your document.

```
376 \providecommand{\abstractname}{Abstract}
377 \providecommand{\dedicationname}{\mbox{}}
378 \providecommand{\prefacename}{PREFACE}
379 \providecommand{\acknowledgename}{ACKNOWLEDGMENTS}
380 \providecommand{\symbolsname}{SYMBOLS}
381 \renewcommand{\tablename}{TABLE}
382 \renewcommand{\figurename}{Figure}
383 \renewcommand{\chaptername}{CHAPTER}
384 \renewcommand{\appendixname}{APPENDIX}
385 \renewcommand{\contentsname}{CONTENTS}
386 \renewcommand{\listfigurename}{FIGURES}
387 \renewcommand{\listtablename}{TABLES}
388 \renewcommand{\bibname}{BIBLIOGRAPHY}
389 \renewcommand{\indexname}{INDEX}
390 %
```

abstract This environment is adapted from the report class since the book class does not have one. Additionaly, we add a \pdfbookmark for the abstract in the pdf document.

```
391 \newenvironment{abstract}{%
392  \ifpdf
393     \pdfbookmark[0]{\abstractname}{abstract}%abstract.0
394  \fi
395  \typeout{Abstract page(s)}
396  \renewcommand{\@oddfoot}{\@empty}
397  \renewcommand{\@evenfoot}{\@empty}
```

If the abstract extends to a second page, place the author's name in top right corner of that page. Make sure it's upright, as required by the University and that this appears at 0.75″ from the top.

```
398    \let\@evenhead\@oddhead
```

```
399    \renewcommand{\@oddhead}{\hfil{\upshape\@author}}
400    \titlepage
401    \null
402    \begin{center}
403    \vspace*{0.25in}
404    {\normalsize\mdseries \normalspacing
405        \@title \\[3.5ex]
406        \normalsize\abstractname \\ by \\ \@author\space}%
407    \@endparpenalty \@M
408    \end{center}\par}%
409 {\par\vfil\null\endtitlepage}
410 %
```

dedication   The "dedication" environment is similar to the "abstract" environment. This page is numbered 2 and the subsequent pages are numbered accordingly.

```
411 \newenvironment{dedication}{%
412    \global\diss@dedicationtrue
413    \typeout{Dedication page}
414    \ifpdf
415        \pdfbookmark[0]{\dedicationname}{dedication}%dedication.0
416    \fi
417    \chapter*{\dedicationname}%
418    \thispagestyle{plain}
419    \setcounter{page}{2}
420    \null\centering}
421 {\par\null\clearpage}%
422 %
```

\tableofcontents   The \tableofcontents macro is redefined to begin at page 2 if the dedication environment does not exist. It is single-spaced.

```
423 \renewcommand\tableofcontents{%
424    \ifdiss@dedication\relax\else\setcounter{page}{2}\fi
425    \chapter*{\contentsname}%
426    \ifpdf
427        \pdfbookmark[0]{\contentsname}{contents}%contents.0
428    \fi
429    \singlespacing
430    \@starttoc{toc}%
431    \normalspacing
432    }
433 %
```

\listoffigures
\listoftables   These macros are modified to add the \listfigurename and \listoftables to the Table of Contents. Both of these are also single spaced. The inter-entry spacing is changed by adding a \vskip after each entry. This is done in the figure and table environments later.

```
434 \renewcommand\listoffigures{%
435    \chapter*{\listfigurename}%
436    \addcontentsline{toc}{chapter}{\listfigurename}%
437    \typeout{List of figures - \listfigurename}
```

```
438        \singlespacing
439        \@starttoc{lof}%
440        \normalspacing
441 }
442 %
443 \renewcommand\listoftables{%
444        \chapter*{\listtablename}%
445        \addcontentsline{toc}{chapter}{\listtablename}%
446        \typeout{List of tables - \listtablename}
447        \singlespacing
448        \@starttoc{lot}%
449        \normalspacing
450 }
451 %
```

preface These environments are similar to the "dedication" environment. They are defined as
acknowledgement \chapter*{} so they are not numbered and not added to Table of Contents and so, add
that manually by using \addcontentsline.

```
452 \newenvironment{preface}{%
453   \typeout{Preface page}
454   \chapter*{\prefacename}
455   \addcontentsline{toc}{chapter}{\prefacename}%
456 }%
457 {\par\null\clearpage}%
458 %
459 \newenvironment{acknowledge}{%
460   \typeout{Acknowledgment page}
461   \chapter*{\acknowledgename}
462   \addcontentsline{toc}{chapter}{\acknowledgename}%
463 }%
464 {\par\null\clearpage}%
465 %
```

symbols Define symbols environment which lays out it as a \chapter* and adds \symbolsname
\sym to the TOC. The environment is actually a horizontally centered longtable environment.
To aid entry of *symbol* and its definition, \sym macro command is also defined.

```
466 \newcommand{\sym}[2]{\ensuremath{#1} & #2 \\}
467 \newenvironment{symbols}[1][rl]{%
468   \typeout{Symbols page}
469   \chapter*{\symbolsname}%
470   \addcontentsline{toc}{chapter}{\symbolsname}%
471   \begin{center}\begin{longtable}{{#1}}%
472 {\end{longtable}\end{center}\par\null}
473 %
```

Modify chapter definition in \@chapter to put the word "Chapter" (\@chapapp) in the
Table of Contents. That is, now the TOC will contain
     "**Chapter 1: First chapter**" rather than "**1. First chapter**"
The rest of the format code is essentially similar to that in the book class.

```
474 \def\@chapter[#1]#2{
```

```
475    \ifnum \c@secnumdepth >\m@ne
476    \if@mainmatter
477      \refstepcounter{chapter}%
478      \typeout{\@chapapp\space\thechapter.}%
479      \addcontentsline{toc}{chapter}%
480        {{\@chapapp\ \thechapter: #1}}%
481      \else
482        \addcontentsline{toc}{chapter}{#1}%
483      \fi
484    \else
485        \addcontentsline{toc}{chapter}{#1}%
486    \fi
487    \chaptermark{#1}%
488    \addtocontents{lof}{\protect\addvspace{10\p@}}%
489    \addtocontents{lot}{\protect\addvspace{10\p@}}%
490    \@makechapterhead{#2}%
491    \@afterheading }%
492 %
```

Now format section headings to conform to the official guidelines.

\@makechapterhead   First, modify the chapter heading label to be normalsize'd and centered. Instead of the bold-faced heading label, also make it \mdseries. If we are in the \mainmatter, we add "CHAPTER" and chapter number before actually putting the chapter name otherwise only the "chapter name" is put. Note that chapter/section headings must all be double-spaced.

```
493 \renewcommand{\@makechapterhead}[1]{%
494    \vspace*{.625in}%
495    {\parindent \z@ \raggedright
496      \ifnum \c@secnumdepth >\m@ne
497        \normalfont\normalsize%
498        \if@mainmatter
499          \ifcentered@chaptitle\center\else\relax\fi%
500          \@chapapp{} \thechapter\par\nobreak
501        \fi
502      \fi
503      \interlinepenalty\@M
504      \ifcentered@chaptitle\center\else\relax\fi%
505      \mdseries{#1}\par\nobreak
506      \vskip 30\p@
507   }}
508 %
```

\@makeschapterhead   Make the TOC, LOF, LOT and other \chapter* headings in normal size, and \mdseries by modifying the macro \@makeschapterhead. Although these heading labels are usually fitting in single-line, we copy the formatting for the chapter heading label (single-spacing) and make the spacing double again for the text.

```
509 \renewcommand{\@makeschapterhead}[1]{%
510    \vspace*{.625in}%
511    {\parindent \z@ \raggedright
512        \normalfont\normalsize%
```

```
513        \interlinepenalty\@M
514        \ifcentered@chaptitle\center\else\relax\fi
515        \mdseries{#1}\par\nobreak
516        \vskip 30\p@
517    }}
518 %
```

Now, set the section labels to `\mdseries` rather than bold-faced. We also make sure that these are set in normal spacing, font and size. This is done for each of `\section`, `\subsection`, `\subsubsection`, `\subsubsubsection`, `\paragraph` and `\subparagraph`.

```
519 \renewcommand\section{\suppressfloats[t]%
520     \@startsection {section}{1}{\z@}%
521     {-4.2ex \@plus -1ex \@minus -.2ex}%
522     {1.8ex \@plus.2ex}%
523     {\normalfont\normalsize\mdseries} }
524 \renewcommand\subsection{\suppressfloats[t]%
525     \@startsection{subsection}{2}{\z@}%
526     {-3.9ex\@plus -1ex \@minus -.2ex}%
527     {1.2ex \@plus .2ex}%
528     {\normalfont\normalsize\mdseries} }
529 \renewcommand\subsubsection{\suppressfloats[t]%
530     \@startsection{subsubsection}{3}{\z@}%
531     {-3.9ex\@plus -1ex \@minus -.2ex}%
532     {1.2ex \@plus .2ex}%
533     {\normalfont\normalsize\mdseries} }
534 \renewcommand\paragraph{%
535     \@startsection{paragraph}{4}{\z@}%
536     {3.9ex \@plus1ex \@minus.2ex}%
537     {-1em}%
538     {\normalfont\normalsize\mdseries} }
539 \renewcommand\subparagraph{%
540     \@startsection{subparagraph}{5}{\parindent}%
541     {3.9ex \@plus1ex \@minus .2ex}%
542     {-1em}%
543     {\normalfont\normalsize\mdseries} }
544 %
```

`\l@chapter` Modify the macro `\l@chapter` that formats chapter titles in the contents-like files (`.toc`, `.lof` and `.lot`) by adding a `\@dottedtocline` macro. The indent width is set to 1.5em - to line up a continued line with the section number below it. We also leave lesser space between each chapter and the last section entry than the default.

```
545 \renewcommand*{\l@chapter}[2]{%
546   \addpenalty{-\@highpenalty}%
547   \setlength\@tempdima{1.5em}%
548   \begingroup \leavevmode
549   \@dottedtocline{1}{0pt}{\@tempdima}{#1}{#2}
550   \par
551   \penalty\@highpenalty
552   \endgroup
553 }
```

554 `%`

`\l@subsubsection` The macro `\l@subsubsection` is modified to indent the `\subsubsection` label same as that for `\subsection` in the table of contents. We also increase the number of section-depth by 1 and force subsubsection entry in the TOC by increasing the `\tocdepth`. In addition, the label number of `\subsubsection` is defined to be similar to that for `\subsection` i.e. all arabic numerals.

```
555 \renewcommand{\l@subsubsection}{%
556     \@dottedtocline{3}{3.8em}{4.1em}}
557 \addtocounter{secnumdepth}{1}
558 \addtocounter{tocdepth}{1}
559 \renewcommand{\thesubsubsection}{%
560     \thesubsection.\arabic{subsubsection}}
561 %
```

quote Redefine the `quote` environment to be single-spaced instead of being same as the rest of the text.

```
562 \renewenvironment{quote}
563                 {\list{}{\rightmargin\leftmargin}%
564                   \singlespacing
565                 \item\relax}
566                 {\endlist}
567 %
```

Set some lengths that are used in the `table` and the `figure` environments. Note that we set the caption width (`\capwidth`) to be 90% of the `\textwidth`.

```
568 \setlength\abovecaptionskip{20\p@}
569 \newlength\capwidth
570 \setlength{\capwidth}{0.90\textwidth}
571 \newlength\abovetableskip
572 \newlength\belowtableskip
573 \newlength\abovefigureskip
574 \newlength\belowfigureskip
575 \setlength\abovetableskip\belowcaptionskip
576 \setlength\belowtableskip\abovecaptionskip
577 \setlength\abovefigureskip\abovecaptionskip
578 \setlength\belowfigureskip\belowcaptionskip
579 %
```

figure For the `figure` environment, first some skip "lengths" are set, then use `\@makefigurecaption` to format the captions instead of the default `\@makecaption`, since the layout is different for `figure` and the `table` environment. Further add a `\vskip` to each entry in `.lof` file so that the inter-caption spacing seems double-spaced.

```
580 \renewenvironment{figure}{%
581     \setlength{\abovecaptionskip}{\abovefigureskip}
582     \setlength{\belowcaptionskip}{\belowfigureskip}
583     \let\@makecaption\@makefigurecaption
584     \@float{figure}}%
585     {%
586     \addtocontents{lof}{ {\vskip 0.4em} }%
```

29

```
587     \end@float%
588 }
589 %
```

\@makefigurecaption The \@makefigurecaption is defined to format the caption in a parbox with width equal
to \capwidth and is formatted in single-spacing. The interline-spacing is then changed
to double after the caption.

```
590 \long\def\@makefigurecaption#1#2{%
591   \vskip\abovecaptionskip
592   \begin{center}
593   \parbox{\capwidth}{
594     \centering\singlespacing
595     {#1}. {#2}%\par
596   \vskip\belowcaptionskip\normalspacing }%
597   \end{center}
598 }%
599 %
```

table After setting the above and below skip lengths, the table environment is set to be
single spaced. However, to obtain double-spacing between the entries, redefine the
\arraystretch to be equivalent to the \double@baselinestretch. This way, while
there is double-spaced entries, the entry itself is single-spaced. Similar to that in
\@makefigurecaption, a \vskip is added to each entry in the .lot file.

```
600 \renewenvironment{table}{%
601   \setlength{\abovecaptionskip}{\abovetableskip}
602   \setlength{\belowcaptionskip}{\belowtableskip}
603   \singlespacing
604   \renewcommand{\arraystretch}{\double@baselinestretch}
605   \let\@makecaption\@maketablecaption
606   \@float{table}}%
607   {%
608   \addtocontents{lot}{ {\vskip 0.4em} }%
609   \end@float%
610 }
611 %
```

\@maketablecaption The \@maketablecaption is defined similar to \@makefigurecaption to have the table
label and caption in separate lines and with normal-spacing (double-spaced).

```
612 \long\def\@maketablecaption#1#2{
613   \vskip\abovecaptionskip
614   \begin{center}
615     \parbox{\capwidth}{
616     \centering\normalspacing
617     {#1}\\[\single@skip]
618     {#2}%\par
619   \vskip\belowcaptionskip }%
620   \end{center}
621 }
622 %
```

30

\longtable Similar to the `table` environment, the `longtable` environment is made singly-spaced but the `\arraystretch` is made equal to double the `baselinestretch`.

```
623 \renewcommand\longtable{%
624     \singlespacing
625     \renewcommand{\arraystretch}{\double@baselinestretch}
626     \begingroup
627     \@ifnextchar[\LT@array{\LT@array[x]}}
628 %
```

\endlongtable This bit is taken from the `longtable.sty`. In order to obtain double-spacing in the list of tables, a `\vskip` of 0.4em is added to `.lot` file.

```
629 \renewcommand\endlongtable{%
630     \crcr
631     \noalign{%
632       \let\LT@entry\LT@entry@chop
633       \xdef\LT@save@row{\LT@save@row}}%
634     \LT@echunk
635     \LT@start
636     \unvbox\z@
637     \LT@get@widths
638     \if@filesw
639       {\let\LT@entry\LT@entry@write\immediate\write\@auxout{%
640         \gdef\expandafter\noexpand
641           \csname LT@\romannumeral\c@LT@tables\endcsname
642             {\LT@save@row}}}%
643     \fi
644     \ifx\LT@save@row\LT@@save@row
645     \else
646       \LT@warn{Column \@width s have changed\MessageBreak
647               in table \thetable}%
648       \LT@final@warn
649     \fi
650     \endgraf\penalty -\LT@end@pen
651     \addtocontents{lot}{ {\vskip 0.4em} }%
652     \endgroup
653     \global\@mparbottom\z@
654     \pagegoal\vsize
655     \endgraf\penalty\z@\addvspace\LTpost
656     \ifvoid\footins\else\insert\footins{}\fi
657 }
658 %
```

\LT@makecaption For the `longtable` environment, the `\LTcapwidth` is set equal to `\capwidth`. In order to obtain consistent table captions, the command `\LT@makecaption` is modified in a similar manner as `\maketablecaption`.

```
659 \setlength{\LTcapwidth}{\capwidth}
660 \renewcommand\LT@makecaption[3]{%
661     \LT@mcol\LT@cols c{\hbox to\z@{\hss\parbox[t]\LTcapwidth{%
662     \vskip\abovetableskip%
663       \centering\normalspacing
```

31

```
664    #1{#2 }\\[\single@skip]
665    {#3}\par
666  \endgraf\vskip\belowtableskip}%
667  \hss}}}
668 %
```

\timenow This macro is used in making the \draftheader and \reviewheader below. It outputs time in HH:MM format.

```
669 \newcommand\timenow{%
670  \@tempcnta=\time \divide\@tempcnta by 60 \number\@tempcnta:\multiply
671  \@tempcnta by 60 \@tempcntb=\time \advance\@tempcntb by -\@tempcnta
672  \ifnum\@tempcntb <10 0\number\@tempcntb\else\number\@tempcntb\fi}
673 %
```

\diss@header This header is used in the dissertation document when the draft or review option is used. These headers serve as a note for the date and time of the document compilation.

```
674 \newcommand{\diss@header}{%
675  \ifdiss@review Review \else Draft \fi document [\today\/ at \timenow\/]
676  }%
677 %
```

The header prepared above is put in the document by modifiying the *plain* and *empty* pagestyles except when the final option is chosen.

```
678 \ifdiss@final
679    \renewcommand{\ps@plain}{
680      \renewcommand{\@oddhead}{\@empty}
681      \renewcommand{\@oddfoot}{\hfil\thepage\hfil}
682      \let\@evenhead\@oddhead
683      \let\@evenfoot\@oddfoot
684    }%
685 \else
686    \renewcommand{\ps@plain}{
687      \renewcommand{\@oddhead}{\framebox[\textwidth]{
688        \centering\footnotesize\tt\diss@header}}%
689      \renewcommand{\@oddfoot}{\hfil\textrm{\thepage}\hfil}
690      \let\@evenhead\@oddhead
691      \let\@evenfoot\@oddfoot
692    }%
693    \renewcommand{\ps@empty}{
694      \renewcommand{\@oddhead}{\framebox[\textwidth]{
695        \centering\footnotesize\tt\diss@header}}%
696      \renewcommand{\@oddfoot}{\@empty}
697      \let\@evenhead\@oddhead
698      \let\@evenfoot\@oddfoot
699    }%
700 \fi
701 %
```

\bibsection By redefining \bibsection macro, add the \bibname to the table of contents and as a chapter heading for the bibliography.

```
702 \renewcommand{\bibsection}{
703   \chapter*{\bibname}%
704   \addcontentsline{toc}{chapter}{\bibname}%
705 }%
706 %
```

\bibfont Changed the \bibfont macro to obtain single-spacing within each bibliographic entry. Between different entries, it is still \normalspacing. In addition, when numrefs option is selected, the \@biblabel is redefined to number the bibliographic entries as 1. xxxx instead of the default [1] xxxx.

```
707 \newcommand{\bibfont}{\singlespacing}
708 \ifnum@refs
709   \renewcommand{\@biblabel}[1]{\hfill#1.\hfill}
710 \fi
711 %
```

Lastly, after the bibliography in the final document, add a framed box which contains blurb about the typesetting program and NDdiss2ε version used for preparing the dissertation document.

```
712 \ifdiss@final
713 \AtEndDocument{
714     \vfill
715     \centering\singlespacing
716     \framebox[0.85\textwidth]{
717     \begin{minipage}{0.80\textwidth}\footnotesize%
718     \centering \itshape This document was prepared \& typeset with
719     \upshape\ifpdf pdf\LaTeX\else\LaTeXe\fi\itshape , and
720     formatted with \upshape\nddiss\xspace\itshape classfile
721     (v\dissfileversion [\dissfiledate]) provided by Sameer Vijay.
722     \end{minipage} }
723     \clearpage}
724 \else\relax\fi
725 %
726 % \endinput
727 % End of file 'nddiss2e.cls'.
```

Change History