

# The NDDiss2 $\epsilon$ class\*

2017-05-09

## Abstract

The NDDiss2 $\epsilon$  class can be used to typeset dissertations submitted to the University of Notre Dame's Graduate School. This class conforms with the Graduate School guidelines as of Spring 2013 for the layout of the Ph.D. dissertations and Master's theses.

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# 1 Introduction

The L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> document class NDdiss2<sub>ε</sub> is suitable for producing dissertations and theses conforming to the Spring 2013 guidelines of the Graduate School at the University of Notre Dame. The package extends the standard L<sup>A</sup>T<sub>E</sub>X `book` class.

The latest version of this class and related documentation can be found in a few places:

- On CTAN: <https://ctan.org/pkg/nddiss>
- On GitHub: <https://github.com/ndlib/nddiss>
- On the University of Notre Dame's Graduate School website: <http://graduateschool.nd.edu/>

## 1.1 Disclaimer

While this class does as much formatting as it can, there are a few formatting items that you, the user, must do manually (see Section 5). Please keep in mind that only *you* are responsible for the correct formatting of your dissertation/thesis. Should you have questions, please consult the official formatting guide or email [dteditor@nd.edu](mailto:dteditor@nd.edu).

## 1.2 Dependencies and Limitations

This classfile depends on many other packages to be installed. All of these required packages are available through MiKTeX and TeXLive, and chances are good they are already installed by your TeX distribution. Refer to section 6 for a list of the essential packages.

The document class has only been tested with a small subset of available packages. 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 the `subfigure` and `subcaption` package and proper formatting of the captions in such an environment. Formatting of the captions could be much easier with the `caption`<sup>1</sup> in general, and is a thing-to-do for future versions. Permitting use of the `subfigure` and `subcaption` packages would also be a good thing to do if an update is

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<sup>1</sup>`caption` package by Axel Sommerfeldt v3.0b[2004/05/16] and higher

ever made for reasons other than resolving conflicts caused by changing Graduate School regulations. If you want to use a `subfigure` environment and don't need the caption capabilities of the `subcaption` package, adding the following code to your preamble may allow you to do this and still have your captions formatted according to the Graduate School's rules.

```
\usepackage{subcaption}
\makeatletter
\renewcommand\LT@makecaption[3]{%
  \LT@mcol\LT@cols c{\hbox to\z@{\hss\parbox[t]{\LTcapwidth{%
    \vskip\abovetableskip%
    \centering\normalspacing
    #1{#2 }\\[\single@skip]
    {#3}\par
    \endgraf\vskip\belowtableskip}%
    \hss}}}
\makeatother
```

### 1.3 History

The `NDdiss2 $\epsilon$`  package is an extensive rewrite by Sameer Vijay of an earlier `NDthesis` class for formatting dissertations. Megan Patnott updated `NDdiss2 $\epsilon$`  to the 2013 Graduate School Formatting guidelines. The `NDThesis` class was by D. A. Peterson.

## 2 Quick Start

This section provides a template you can use to get started. The distribution comes with a more detailed file, `template.tex`, that is similar, but more detailed.

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

\begin{document}

\frontmatter

\title{Title in Title Caps}
\author{Your Name}
\work{Dissertation}
\degaward{Doctor of Philosophy}
\advisor{}
\department{}
\maketitle
\makepublicdomain % There is also a copyright option

\begin{abstract}
Abstract here
```

```

\end{abstract}

% dedication is optional
\begin{dedication}
For Someone
\end{dedication}

\tableofcontents
\listoffigures
\listoftables

% list of symbols is optional
\begin{symbols}
\sym{a}{definition of a}
\end{symbol}

% preface is optional
\begin{preface}
Preface here
\end{preface}

\begin{acknowledge}
Thanks to everyone
\end{acknowledge}

\mainmatter

\chapter{A New Dawn} % Chapter 1
All the text ...

\appendix
\chapter{Additional Data} % Appendix A

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

\end{document}

```

### 3 Usage

Invoke the  $\text{NDdiss2}_\epsilon$  document class by adding `\documentclass[<options>]{nddiss2e}` at the beginning of your  $\text{\LaTeX}$  source file. For most people the options `\documentclass[draft]{nddiss2e}` is good enough for the initial revisions. If you want your figures to display, use `\documentclass[review]{nddiss2e}`.

Use the option `\documentclass[final]{nddiss2e}` for your formatting check submission, and `\documentclass[final,noinfo]{nddiss2e}` for the final sub-

mitted version.

If you have two advisors, add the option `twoadvisors` here, and then use `\secondadvisor{}` later on the title page to give the name of the second advisor.

By default, all documents produced using this class are formatted as one-sided, doublespaced, letter-sized pages, per the Graduate School requirements. In theory, the class file’s specifications should override your system’s defaults. If, however, you are getting A4 paper, try adding `\pdfpagewidth{8.5in}` and `\pdfpageheight{11in}` immediately after the `\documentclass` in your file.

### 3.1 Options

`draft` Exactly *one* of these options must be used. The `draft` and `review` options enable faster processing of the document and also include annotations to help write and edit it.

The `draft` option enables a fast processing and preliminary document showing the labels for citations, tables, figures etc. and a black solid rule highlighting the horizontal overflows. Additionally, figures are replaced with placement boxes showing where the included figure would be placed. Such a document would be the one you would prepare for revising your text during writing stages.

The `review` option makes it possible to prepare a document that is one step closer to the final version. Almost all the formatting of the final version is present, but the labels and keys as in the `draft` option are also displayed. A document prepared with the `review` option would be the one to personally check for proper formatting and possibly giving to your advisor if she wished to suggest corrections.

The `final` option produces the document to be submitted to the Graduate School for formatting checks and as the final version.

`twoadvisors` The `twoadvisors` option will produce a title page with space for two advisors. Use the `\secondadvisor` macro command (discussed in Section 4.1) on the title page to give the name of the second advisor.

`noinfo` The `noinfo` option disables the information page produced when the `review` or `final` style options are used. It is recommended that you only use this option when making the final submission to the Graduate School.

`numrefs` These options determine how citations are displayed in the text. The default style is `numrefs`. The `numrefs` option produces a numbered citation style by using `natbib` and the “`nddiss2e`” or “`nddiss2enoarticletitles`” citation style file<sup>2</sup>. The `textrefs` option changes the citation style to be similar to “author-date” style with the same files.

`sort` At most one of these options should be selected. The `sort` option will cause both numerical and “author-date” style references to be sorted in the order that they appear in the bibliography when multiple references are cited. The `compress` option compresses numerical citations, e.g. it turns [1,2,3] into [1-3], and does nothing to “author-date” style references. The `sort&compress` option first sorts

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<sup>2</sup>`nddiss2e.bst` is a slight modification of `abbrvnat.bst` in the `natbib` package; `nddiss2enoarticletitles.bst` is essentially the same as `nddiss2e`, but does not display the titles of journal articles, as this is the standard in some fields

and then compresses numerical references, and only sorts “author-date” style references.

Since the same set of packages and style files result in differing citation formats, refer to the documentation for `natnotes.dvi` in your `TEXMF` tree, to be aware of the various ways in which you can make a citation in your text.

`10pt`      These options adjust the font size of the body text. The choice is only applicable when the `draft` option is used, and defaults to `10pt`. When `review` or `final` is used, this option is ignored and `12pt` is used.

`11pt`  
`12pt`  
`twoside`      The `twoside` option causes the class file to prepare a document meant to be printed double-sided. This option is strictly for if 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. Do NOT use this option when preparing to submit it to the Graduate School.

`nocenter`      The `nocenter` option allows non-centered chapter titles. Do NOT turn in your document this way to the Graduate School!

`openbib`      The `openbib` option formats your bibliography in the following manner:

Author

Article/book title

Other information

Website, if applicable

Usually you would not need to use this option since the default layout of the bibliography is acceptable.

## 4 Arrangement of Contents

A dissertation or a thesis document contains the following parts, in the order listed. Only those marked as optional may be omitted.

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 of 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

`\maketitle` The title page is generated by `\maketitle` with no arguments. This macro has been modified for providing a title page in the correct format.

You can set information to display on the title page by using the following commands before invoking `\maketitle`.

- |                               |  |
|-------------------------------|--|
| <code>\title{}</code>         | • The title of the document, using the <code>\title</code> macro. You may use linebreaks within the title, protected via <code>\protect\\</code> and the title may be up to four lines long.   |
| <code>\author{}</code>        | • Give your name in full and exactly as registered with the Graduate School, using the <code>\author</code> macro, e.g. <code>\author{Gary Graham Gordon-Graeme}</code> ).   |
| <code>\work{}</code>          | • Whether the document is a <i>Thesis</i> or a <i>Dissertation</i> as the argument of the <code>\work</code> macro, e.g. <code>\work{Dissertation}</code> ).   |
| <code>\degaward{}</code>      | • Specify the degree you're aiming for with the <code>\degaward</code> macro. Should be one of <code>\degaward{Doctor of Philosophy}</code> (without the "in <i>subject</i> " or <code>\degaward{Master of Science\\in\\Engineering}</code> ). |
| <code>\advisor{}</code>       | • Give the name of your advisor with the <code>\advisor</code> macro.  |
| <code>\secondadvisor{}</code> | • Give the name of your second advisor, if any, with the <code>\secondadvisor</code> macro. You also need to pass in the <code>twoadvisors</code> option in the <code>\documentclass</code> declaration.                                       |
| <code>\department{}</code>    | • Give the name of your department with the <code>\department</code> macro, e.g. <code>\department{Gnological Engineering}</code> ).   |
| <code>\degdate{}</code>       | • The month and year of the defense of the thesis with the <code>\degdate</code> e.g. <code>\degdate{June 2004}</code> ). If you forget to declare this, the current month/year will be used.  |

## 4.2 Copyright Page

- |                                 |  |
|---------------------------------|--|
| <code>\makecopyright</code>     | The <code>\makecopyright</code> macro should be invoked after <code>\maketitle</code> to produce a copyright page. Prior to calling <code>\makecopyright</code> , you may specify a different name for the copyright holder (the default is the name given through the <code>\author</code> macro) and for the copyright year (the default being the current year). Do this with the <code>\copyrightholder{&lt;name&gt;}</code> and <code>\copyrightyear{&lt;year&gt;}</code> macros. |
| <code>\copyrightholder{}</code> |  |
| <code>\copyrightyear{}</code>   |  |
| <code>\makepublicdomain</code>  | Alternatively, you can use <code>\makepublicdomain</code> 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 dissertation in the public domain, you must declare it as such explicitly.

### 4.3 Abstract Page(s)

**abstract** The abstract text should be placed between `\begin{abstract}` and `\end{abstract}`. If the abstract is longer than one page, the environment will place the author’s name in the top-right header.

`\abstractname{}` You may use `\abstractname{<text>}` to change the abstract caption to **text**. Default name: **Abstract**. You probably don’t need to change it.

### 4.4 Dedication

**dedication** The dedication is optional. If you want one, use the **dedication** environment. The format of dedication is essentially free. This environment will center the text of your dedication vertically on the page.

`\dedicationname{}` You may use `\dedicationname{<text>}` to change the title for the dedication page. Default name: `\mbox{}` i.e. an empty title. You probably don’t need to change it.

### 4.5 Table of Contents; Lists of Figures and Tables

`\tableofcontents` Use the macros `\tableofcontents`, `\listoffigures` and `\listoftables`, *in this order*, to produce the required table of contents and lists of figures and tables.

`\listoffigures` You may use `\contentsname`, `\listfigurename` and `\listtablename` to change the titles for these sections. By default they are **CONTENTS**, **FIGURES**, and **TABLES**. You probably don’t need to change them.

`\listoftables`

`\contentsname{}`

`\listfigurename{}`

`\listtablename{}`

### 4.6 List of Symbols

**symbols** The list of symbols is optional. Use the **symbols** environment to format a list of symbols/abbreviations used in your work. The environment takes an optional argument specifying the desired format, e.g. `\begin{symbols}[c1]` for first column centered and the next column aligned left. By default, the first column will be right aligned and the second column will be left aligned. You may use any of the standard **tabular** column alignment options.

`\sym{ }{ }` The command `\sym{<symbol>}{<definition>}` may make the task of entering the symbols and their meanings in the **symbols** environment easier. `\sym` takes two arguments: the first, a math “object” and the second, the plain text describing the symbol. Since the first argument is in math mode, any plain text needs to be wrapped with `\mathrm{. .}`. Likewise, any math symbol in the second argument needs to be placed in `$. . $`. Example: `\sym{\beta_{\mathrm{norm}}}{Definition for  $\beta$ }`

`\symbolsname{}` You may use `\symbolsname{}` to change the title of the symbols section. Default name: **SYMBOLS**.



## 4.7 Preface

`preface` The `preface` environment is provided for formatting the preface to your work.  
`\prefacename{}` You may use `\prefacename` to change the name of this section. Default name: PREFACE.

## 4.8 Acknowledgments

`acknowledgments` The environment `acknowledgments` is used to format the acknowledgment *chapter*.  
`\acknowledgename{}` You may use `\acknowledgename` to change the name of this section. Default name: Acknowledgments.

## 4.9 Text

`\mainmatter` Use the macro `\mainmatter` to mark the beginning of your text. You can then use `\part`, `\chapter`, `\section`, `\subsection`, and `\subsubsection` commands, as you would with the `book` class. Text is formatted in `\normalspacing` i.e. 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, and if so are formatted doubly spaced.

`\unnumchapter{}` Use the macro `\unnumchapter` to create to create unnumbered chapters that appear in the Table of Contents.

## 4.10 Appendix

`\appendix` Use the command `\appendix` after the last normal chapter to signal that all following chapters are to be appendices. This use is the same as in the `book` class. To begin an appendix, use the `\chapter{<title>}` macro.

## 4.11 Backmatter

`\backmatter` The `\backmatter` macro separates the bibliography, index and glossary from the main matter and any appendices.

## 4.12 Bibliography

`\bibliography` If you are using `BIBTEX` (and why would you not want to use `BIBTEX`?), use the `\bibliography{<bibfile>}` macro to generate the bibliography. You should refer to `BIBTEX` manual for details about making a `.bib` file and format for the entries.

For citing references in the text, the package `natbib` is included with either the settings `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.

**Warning:** The packages `cite` and `citation` are NOT compatible with the `natbib` package, and will cause errors if used.

`thebibliography` If you are not using `BIBTEX` make your own bibliography by using the `thebibliography` environment. In this case, you would have to write the reference entries

in the right format in your `.tex` source file itself. If you are using the `textrefs` option, you'll need to consult the `natbib` manual to ensure that you enter your entries in the format required by the package.

`\bibname{}` You may use `\bibname{newbibname}` to change the name of this section. Default name: Bibliography.

### 4.13 Chapter-wise Bibliography

By default the bibliography appears at the end of your work and contains all the references from the entire entity. If you need to have a separate bibliography for each chapter, you can do it in the following way. First, load the package `chapterbib` without any options in the preamble of your main source file and redefine the commands `\bibname` and `\bibsection` as shown below.

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

To process the bibliography for each chapter individually, the chapters or sections must be separated into different files and *include* them in the main file, as shown above. Each such `\included` 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.

After compiling the main tex file once (with `latex` or `pdflatex`), the `.aux` files needed by `bibtex` will have been created and you can then run `bibtex` on each of the separate source 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.

## 5 Note For Authors

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

- The List of Figures must be *before* the List of Tables, i.e. the macro command `\listoffigures` comes before `\listoftables` in the frontmatter.

- Table captions must be *above* the corresponding table, In case of the `table` environment, this can be achieved by putting `\caption` before you include the table (e.g. in a `tabular` environment).
- Figure captions should be *below* the corresponding figure. In the `figure` environment, the `\caption` goes after the `\includegraphics` macro command.
- The bibliography is the last section/chapter of the thesis—unless you are using the *chapter-wise* bibliography.

## 5.1 Tips and Suggestions

- It is *strongly* recommended that you compile your document with pdfL<sup>A</sup>T<sub>E</sub>X. Compiling to dvi or postscript first may result in “fuzzy” fonts when viewing the document on your screen. Additionally, the benefits of `hyperref` and `pdfscape` are only available if you compile using pdfL<sup>A</sup>T<sub>E</sub>X.
- Use the `\toprule`, `\midrule` and `\bottomrule` macro commands (from the `booktabs` package) in tables for generating the appropriate horizontal rules. Refrain from using vertical rules to separate columns in tables as much as possible.
- Use the `longtable` environment for handling very long tabular materials. Example:

```
\begin{longtable}{lc}
\caption[] {LONG TABLE CAPTION \label{tab:longtable} }
\toprule
Heading 1 & Heading 2 \\
\midrule
\endfirsthead
\caption[] { } \\ % doesn't matter what text is in the continued caption.
\midrule
Heading 1 & Heading 2 \\
\midrule
\endhead
\endfoot
\bottomrule
\endlastfoot
% Now the tabular material %
Long & Table etc. \\
\end{longtable}
```

- If a figure or table is very wide and will not fit on a page, use the `landscape` environment (from the included `lscape` package) to format them in *landscape* mode. They will automatically appear on a separate page. If you use pdfL<sup>A</sup>T<sub>E</sub>X to compile your document, then the included `pdfscape` package will flip this page on the screen for easier reading.

- The `sidewaystable` environment (from the included `rotating` package) is incompatible with the current class and should be avoided.
- Usually the width of the figure and table captions is 90% of the `textwidth` (i.e. `0.9\textwidth`). If needed, the width can be changed on a case-by-case basis by doing one of the following:
  - Use a `minipage` environment of appropriate width and enclose your tabular or figure float inside it, or
  - 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
\caption{TABLE CAP\label{tab:this}}
\begin{tabular}{lc}
...
\end{tabular}
\end{table}
\setlength{\LTcapwidth}{6in}
\begin{longtable}{lccc}
...
\end{longtable}

```

- Use the `tabularx` environment for the actual formatting of the tables (within the `table` environment). It differs 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.
- To cite a website in your bibliography<sup>3</sup>, 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}",
}

```

When processed with the `nddiss2e.bst` citation style file this gives:

111. N. Fairley. CasaXPS VAMAS processing software. Website. <http://www.casaxps.com>.

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<sup>3</sup>More info at <http://www.tex.ac.uk/cgi-bin/texfaq2html?label=citeURL>

## 5.2 You Found Errors?

Errors in a  $\text{\LaTeX}$  document are to be expected. If you have a problem that is that seems to be more than a typo or unbalanced brace, it is possible that there is a conflict between the packages you have included and those that `NDdiss2 $\epsilon$`  uses. If you find yourself in that situation, there is a mailing list for handling support issues with `NDdiss2 $\epsilon$` . Look through the archive, and if there are no answers, please send an email to `ND-LATEX-USERS@listserv.nd.edu` (registration required). The more effort you spend in isolating the problem or in troubleshooting will make it more likely that others can reproduce the problem and help you solve it. Also if you have a problem that you then solve, please also email the list. Your doing so will help the next person to have that problem, and will also make the maintainers aware of it, so future versions of the class file can be better.

## 6 Other Packages Used

A number of packages are required by default and must be present in your  $\text{\TeX}$  search path (if you use a package manager such as `MiKTeX` or `TeXLive`, it will take care of this for you). As far as possible, these have been tested for proper formatting style with the `NDdiss2 $\epsilon$`  class file. The list includes `ifthen`, `exscale`, `ifpdf`, `ifluatex`, `ifxetex`, `xspace`, `longtable`, `indentfirst`, `tabularx`, `showkeys`, `enumerate`, `latexsym`, `epsfig`, `color`, `graphicx`, `url`, `setspace`<sup>4</sup>, `amsmath`, `float`, `lscap`, `rotating`, `booktabs`, and `natbib`<sup>5</sup>. Sameer urges 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. Of these packages, `ifpdf`, `longtable`, `natbib`, `booktabs`, `rotating`, `url`, and `setspace` are not part of the  $\text{\LaTeX}$  required distribution, so you may need to download them. They are all available through both `MiKTeX` and `TeXLive`; note that `ifpdf` is part of the `oberdiek` bundle, which is what you need to download to get that package if it is not already installed on your system.

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

In general, the official guidelines of the Graduate School are followed to the maximum extent 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. Per the guide, the number of different fonts and font sizes used 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.

---

<sup>4</sup>v6.7[2000/12/01] or above

<sup>5</sup>v8.31[2009/07/16] or above

## 6.1 Generating PDF document

The `NDdiss2 $\varepsilon$`  class also allows production of pdf documents with pdfL<sup>A</sup>T<sub>E</sub>X . As of Spring 2013, this is the preferred method of compilation. In this case, the `hyperref` and `pdflscape` packages are also required. The `hyperref` package ensures 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 `hyperref` are passed on, for advanced features refer to its documentation. The `pdflscape` package flips pages with landscape orientation in the pdf file for easier reading, but the location of the page numbers does not change.

Figures must be in pdf, jpeg, png, or gif format, and not in encapsulated postscript (eps). An easy way to convert *eps* files to *pdf* files is to use the utility `epstopdf` or `eps2pdf`, which should be available on your unix-like distribution already (should you have one). It is also possible to convert your eps files to pdfs using an online conversion tool. Searching for “eps to pdf” brought up several free options in Fall 2012.

## 7 The Implementation

Following is our attempt at documenting the source of the `NDdiss2 $\epsilon$`  class file for the `TEX` hackers.

At the start, we define the base version of L<sup>A</sup>T<sub>E</sub>X 2 $\epsilon$  needed and the label information for the `NDdiss2 $\epsilon$`  class.

```

1 \NeedsTeXFormat{LaTeX2e}[1999/12/01]
2 \ProvidesClass{nddiss2e}
3     [2016/10/16 v3.2016%
4     Notre Dame Dissertation document class]
5 %

\disssfileversion The \disssfileversion and \disssfiledate macros contain the version and the date of
\disssfiledate    the release.

6 \providecommand{\disssfileversion}{3.2017.1}
7 \providecommand{\disssfiledate}{2017/05/09}
8 %
```

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

```

9 \newif\ifdisss@draft           \disss@drafttrue
10 \newif\ifdisss@review         \disss@reviewfalse
11 \newif\ifdisss@final          \disss@finalfalse
12 \newif\ifdisss@info@page      \disss@info@pagetrue
13 \newif\ifdisss@advisors@two   \disss@advisors@twofalse
14 \newif\ifdisss@dedication     \disss@dedicationfalse
15 \newif\ifdisss@num@refs       \disss@num@refstrue
16 \newif\ifdisss@centered@chapt \disss@centered@chapttrue
17 \newif\ifdisss@ltfirstcaption
18 %

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.

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

```

32 \typeout{FINAL MODE}\typeout{}\info@pagetrue%
33 \diss@draftfalse\diss@reviewfalse\diss@finaltrue
34 \PassOptionsToClass{12pt,letterpaper,oneside,final}{book} }
35 %

```

**numrefs** The options **numrefs** or **textrefs** select the appropriate citation style i.e. “numbered” or “textual”, respectively. By choosing **textrefs**, one can get “author-date” style of citation in the text. The default is **numrefs**.

```

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

```

The option **nocenter** allows non-centered chapter titles.

```

40 \DeclareOption{nocenter}{\centered@chaptitelfalse}
41 %

```

The **openbib** option 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.

```

42 \DeclareOption{openbib}{%
43 \PassOptionsToPackage{openbib}{natbib}
44 }
45 %

```

The **sort** option is passed to **natbib**, and causes multiple citations to be listed in the sequence they appear in the bibliography.

```

46 \DeclareOption{sort}{%
47 \PassOptionsToPackage{sort}{natbib}
48 }
49 %

```

The **compress** option is passed to **natbib**, and causes numerical citations to be compressed so that, e.g. 1,2,3 becomes 1-3. Does not also sort.

```

50 \DeclareOption{compress}{%
51 \PassOptionsToPackage{compress}{natbib}
52 }
53 %

```

The **sort&compress** option sorts numerical citations, and then compresses them.

```

54 \DeclareOption{sort&compress}{%
55 \PassOptionsToPackage{sort&compress}{natbib}
56 }
57 %

```

The other options are declared in the following lines.

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

```

58 \DeclareOption{twoadvisors}{\typeout{TWO ADVISORS}\typeout{}\%
59 \advisors@twotrue}
60 %

```



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

```
12pt 61 \DeclareOption{10pt}{%
62   \ifdiss@draft%
63     \PassOptionsToClass{10pt}{book}%
64   \else%
65     \OptionNotUsed%
66     \ClassWarningNoLine{nddiss2e}%
67       {Font size 10pt not allowed; using 12pt}%
68   \fi%
69 }
70 \DeclareOption{11pt}{%
71   \ifdiss@draft%
72     \PassOptionsToClass{11pt}{book}%
73   \else%
74     \OptionNotUsed%
75     \ClassWarningNoLine{nddiss2e}%
76       {Font size 11pt not allowed; using 12pt}%
77   \fi
78 }
79 \DeclareOption{12pt}{%
80   \PassOptionsToClass{12pt}{book}%
81 }
82 %
```

```
83 \DeclareOption{noinfo}{\info@pagefalse}
84 %
```

The twoside option is for 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.

```
85 \DeclareOption{twoside}{\typeout{TWO SIDED DOCUMENT}}%
86 \PassOptionsToClass{twoside}{book} }%
87 %
```

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.

```
88 \DeclareOption*{\ClassWarning{nddiss2e}%
89   {UnknownOption ‘\CurrentOption’} }%
90 \ProcessOptions\relax
91 \LoadClass{book}
92 %
```

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

```
93 \RequirePackage{ifthen,exscale,etoolbox}
94 \RequirePackage{ifpdf,ifluatex,ifxetex}
95 \ifboolexpr{bool{pdf} or bool{xetex} or bool{luatex}}{}{%
96   \ClassError{nddiss2e}{%
```

```

97         PDF Output is required to support the PDF/A format.
98     }{DVI output is not supported. Use pdflatex to generate the dissertation.}
99 }
100 \RequirePackage[a-2b]{pdfx}
101 \RequirePackage{longtable}
102 \RequirePackage{threeparttable}
103 \RequirePackage[flushleft]{threeparttablex}
104 \RequirePackage{xspace}
105 \RequirePackage{indentfirst}
106 \RequirePackage{tabularx}
107 \RequirePackage{enumerate}
108 \RequirePackage{latexsym}
109 \RequirePackage{textcase}
110 %
    If the \diss@final is set false (when using draft or review option) then the showkeys
    package is also loaded.
111 % \ifdiss@final\relax\else\RequirePackage{showkeys}\fi
112 %
    Depending in whether you are using pdfLATEX or plain LATEX , epsfig, color and graphicx
    are loaded with respective options.
113 \ifbool{bool{pdf} or bool{xetex} or bool{luatex}}{%
114     \RequirePackage{epsfig}
115     \RequirePackage{color}
116     \RequirePackage{graphicx}
117     \AtBeginDocument{
118         \pdfadjustspacing=1
119     }
120 }{%
121     \RequirePackage[dvips]{epsfig}
122     \RequirePackage[dvips]{color}
123     \RequirePackage[dvips]{graphicx}
124 }
125 %
    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 separator 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 delimiter and separator, in this case, are round brackets and
    colon, respectively.
126 \ifnum@refs
127     \RequirePackage[numbers]{natbib}
128 \else
129     \RequirePackage[authoryear]{natbib}
130 \fi

```

Additionally, the packages `amsmath`, `float`, `booktabs`, `rotating`, `url` and `setspace` are loaded when (pdf)L<sup>A</sup>T<sub>E</sub>X processes `\begin{document}`. Again, the order of these packages is important. Additionally when using pdfL<sup>A</sup>T<sub>E</sub>X , 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. Megan added required package pdfscape, which is part of the oberdiek bundle in MiKTeX and TeXLive. Using this package will flip landscape pages on the screen so that it's easier to read.

```

131 \AtBeginDocument{
132 \RequirePackage{amsmath}
133 \RequirePackage{float}
134 \RequirePackage{booktabs}
135 \RequirePackage{rotating}
136 \RequirePackage{url}
137 \RequirePackage[doublespacing]{setspace}[2000/12/01]
138 \ifboolexpr{bool{pdf} or bool{xetex} or bool{luatex}}{%
139   \ifluatex
140     \RequirePackage[luatex]{pdfscape}
141   \else
142     \ifxetex
143       \RequirePackage[xetex]{pdfscape}
144     \else
145       \ifpdf
146         \RequirePackage{pdfscape}
147       \fi
148     \fi
149   \fi
150   % cannot use RequirePackage since pdfx also includes hyperref
151   \hypersetup{
152     plainpages=false,
153     pdfpagelabels,
154     bookmarks=true,%
155     bookmarksnumbered=true,%
156     linktocpage=true,%
157     breaklinks=true,%
158     bookmarkstype=toc,%
159     colorlinks=false,%
160     pdfpagemode=UseOutlines}
161 }{}
162 }
163 \RequirePackage{metalogo}
164 %
165
166 Set the \pagestyle for the document to plain here and define default spacing.
167 \AtBeginDocument{
168 \pagestyle{plain}
169 \normalspacing
170 \typeout{Pagestyle and spacing normal}
171 }
172 %
173
174 Here, define some spacing macros for page layout and doublespacing.
175 \newcommand{\normalspacing}{\doublespacing}
176 \newcommand\single@baselinestretch{0.979}

```

```

173 \newcommand\double@baselinestretch{1.625}
174 \newlength{\usedtextsize}
175 \setlength{\usedtextsize}{\f@size pt}
176 \newlength{\single@skip}
177 \setlength{\single@skip}{\single@baselinestretch \usedtextsize}
178 \newlength{\double@skip}
179 \setlength{\double@skip}{\double@baselinestretch \usedtextsize}
180 \setlength{\footnotesep}{\double@skip}
181 %

```

Define new lengths for some variables for a proper layout of normal pages, pages with text and figures and pages with only floats. Note that although the geometry package is usually easier, when Megan tried to switch to that she discovered that something ends up overwriting it and, although the the showframe option showed that the margins were setting correctly, the text didn't look like they were. So these length values are set to what geometry said they should be to get a 1.5 in left margin and 1 in margins on all other sides (we'll use vspace commands later to get the 2 in top margin on pages where that's needed).

```

182 \setlength{\hoffset}{0pt}
183 \setlength{\voffset}{0pt}
184 \setlength{\topmargin}{-32pt}
185 \setlength{\headsep}{20pt}
186 \setlength{\marginparwidth}{47pt}
187 \setlength{\marginparsep}{7pt}
188 \setlength{\textheight}{648pt}
189 \setlength{\textwidth}{432pt}
190 \setlength{\oddsidemargin}{36pt}
191 \setlength{\evensidemargin}{36pt}
192 \setlength{\footskip}{30pt}
193 %
194 \setlength{\floatsep}{30pt}
195 \setlength{\intextsep}{50pt}
196 %
197 \newcommand{\clearempydoublepage}{\newpage{\pagestyle{empty}}%
198 \cleardoublepage}}
199 %

```

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

```

200 \DeclareRobustCommand{\nndiss}{%
201 \textsf{\scshape nd}diss}\kern-0.03em%
202 2$_\textsf{\textstyle varepsilon}$}
203 %

```

\work Here define new macros for use in the dissertation title page.

```

\degaward 204 \renewcommand{\title}[1]{\def\@title{#1}}
\advisor 205 \newcommand{\work}[1]{\def\@work{#1}}
\secondadvisor 206 \newcommand{\degaward}[1]{\def\@degaward{#1}}
\department 207 \newcommand{\advisor}[1]{\def\@advisor{#1}}
\degdate 208 \ifadvisors@two

```

```

209 \newcommand{\secondadvisor}[1]{\def\@secondadvisor{#1}}
210 \fi
211 \newcommand{\department}[1]{\def\@department{#1}}
212 \newcommand{\degdate}[1]{\def\@degdate{#1}}
213 \degdate{\ifcase\month\or
214 January\or February\or March\or April\or May\or June\or
215 July\or August\or September\or October\or November\or December\fi
216 \space\number\year}
217 %

```

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

```

218 % Defaults are empty except the \degdate
219 \title{}
220 \author{}
221 \work{}
222 \degaward{}
223 \advisor{}
224 \ifadvisors@two \secondadvisor{} \fi
225 \department{}
226 %

```

`\@infopage` Define `\@infopage` macro that will create a page which contains important information about the document and the version of `NDdiss2ε` used etc. for the end-user and the proofreader along with a standard disclaimer and details of where to find documentation for the `NDdiss2ε` class file. This information can be suppressed by specifying the “`noinfo`” option while invoking the `NDdiss2ε` class.

```

227 \DeclareRobustCommand{\@infopage}{
228 \thispagestyle{empty}
229 \null\vspace*{\single@skip}
230 \begin{center}
231 This \@work\space \entitled \MakeTextUppercase{\@title} \
232 typeset with \nddiss\ v\
233 \dissfileversion\ (\dissfiledate) \%
234 on \today\space for\
235 \@author\
236 \end{center}
237
238 \normalfont\normalsize\singlespacing
239
240 \noindent This \LaTeXe\space classfile conforms to the
241 University of Notre Dame style guidelines as of Fall
242 2012. However it is still possible to generate a
243 non-conformant document if the instructions in the class
244 file documentation are not followed!
245
246 \begin{center}
247 \begin{minipage}{0.75\textwidth}
248 \noindent Be sure to refer to the published Graduate
249 School guidelines at \url{http://graduateschool.nd.edu}

```

```

250 as well. Those guidelines override everything mentioned
251 about formatting in the documentation for
252 this \nddiss\space class file.
253 \end{minipage}
254 \end{center}
255
256 \noindent\itshape This page can be disabled by
257 specifying the ‘‘{\upshape\ttfamily noinfo}’’ option to the class invocation.
258 \upshape
259 (i.e.,{\ttfamily{\textbackslash}documentclass[\ldots,noinfo]{\nddiss2e\}}
260 )
261 \begin{center}
262 {\bfseries\large\singlespacing This page is \slshape NOT
263 \upshape part of the dissertation/thesis. It should be disabled before
264 making final, formal submission, but should be included in the version
265 submitted for format check.}
266 \end{center}
267 \normalfont
268 \nddiss\ documentation can be found at these locations:
269 \begin{center}
270 \url{http://graduateschool.nd.edu} \\
271 \url{https://ctan.org/pkg/nddiss}
272 \end{center}
273
274 \vfill
275 \normalfont\normalsize\normalspacing\eject}
276 %

```

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

```

277 \renewcommand{\maketitle}{
278 \ifinfo@page\@infopage\else\relax\fi%
279 \clearemptydoublepage
280 \normalfont\normalsize\normalspacing

```

**titlepage** The structuring begins with checking the proper macros for obtaining 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.

```

281 \begin{titlepage}%
282 \ifthenelse{\equal{\@work}{}}{\ClassError{nddiss2e}%
283 {The \protect\work\space macro is undefined.\MessageBreak
284 The title page may be incorrectly formatted.}%
285 {Specify \protect\work\space as Dissertation or Thesis}}{\relax}
286 \ifthenelse{\equal{\@degaward}{}}{\ClassError{nddiss2e}%
287 {The \protect\degaward\space macro is undefined.\MessageBreak
288 The title page may be incorrectly formatted.}%
289 {Specify \protect\degaward\space. It defines the awarded degree%
290 (Ph.D., M.S., etc.)}}{\relax}
291 \ifthenelse{\equal{\@advisor}{}}{\ClassError{nddiss2e}%

```

```

292 {The \protect\advisor\space macro is undefined.\MessageBreak
293     The title page may be incorrectly formatted.}%
294 {Specify \protect\advisor\space It is who signs your walking papers!}}{\relax}
295 \ifthenelse{\equal{\@department}{}}{\ClassError{nddiss2e}}%
296 {The \protect\department\space macro is undefined.\MessageBreak
297     The title page may be incorrectly formatted.}%
298 {Specify which \protect\department\space is awarding your degree?}}{\relax}
299 \ifadvisors@two
300 \ifthenelse{\equal{\@secondadvisor}{}}{\ClassError{nddiss2e}}%
301 {The \protect\secondadvisor\space macro is undefined.\MessageBreak
302     The title page may be incorrectly formatted.}%
303 {Use \protect\secondadvisor\space for your second advisor}}{\relax}
304 \fi
305 %

```

Now set up some skip registers to hold the inter-data spacing. The initial values will create a two-inch top margin for the title page, provided the title is only one line long. `\skip1` is the primary internal spacing command; `\skip2` is the spacing between the student's name and the line for the first adviser to sign if there are two advisers and `\skip3` is the spacing between the student's name and the line for the adviser to sign if there is only one adviser; `\skip4` controls the top margin. We'll account for titles longer than one line in a bit ...

```

306 \skip1=2.1\double@skip
307 \skip2=1.7\double@skip
308 \skip3=2.7\double@skip
309 \skip4=36pt
310 %

```

If the author has two advisers, we need to do a little tweaking to the internal spacing.

```

311 \ifadvisors@two
312     \skip1=1.6\double@skip
313 \else\relax
314 \fi

```

The 2012 formatting guidelines require the title to be 2" from the top of page. If it's more than one line long, we need to adjust the internal spacing:

```

315 \setbox0=\vbox{\MakeTextUppercase{\@title}}
316 \ifdim \ht0 > 3\double@skip
317     \advance \skip1 -.75\double@skip
318 \else
319     \ifdim \ht0 > 2\double@skip
320         \advance \skip1 -.5\double@skip
321     \else
322         \ifdim \ht0 > \double@skip
323             \advance \skip1 -.25\double@skip
324         \fi
325     \fi
326 \fi

```

Our default assumes a one-line `degree` field such as

Doctor of Philosophy

but we check to see if it is two or three lines long. If so, we need to remove those extra lines from the internal spacing.

```

327 \setbox1=\vbox{\@degaward}
328 \ifdim \ht1 > 2\double@skip
329 \advance\skip1 -.5\double@skip
330 \else
331 \ifdim \ht1 > \double@skip
332 \advance \skip1 -.25\double@skip
333 \else
334 \relax
335 \fi
336 \fi

```

If we have two advisers, a three or four line title, and a three line degree field or two advisers, a four line title, and a two line degree field, then we need to remove some spacing between the name and the first adviser and from the top margin, and give that space to the internal spacing.

```

337 \ifadvisors@two
338 \ifdim \ht0 > 3\double@skip
339 \ifdim \ht1 > \double@skip
340 \advance \skip4 -.675\double@skip
341 \advance \skip2 -.4\double@skip
342 \advance \skip1 .25\double@skip
343 \else \relax
344 \fi
345 \else
346 \ifdim \ht0 > 2\double@skip
347 \ifdim \ht1 > 2\double@skip
348 \advance \skip2 -.4\double@skip
349 \advance \skip1 .1\double@skip
350 \else \relax
351 \fi
352 \else \relax
353 \fi
354 \fi
355 \else \relax
356 \fi

```

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

```

357 \null\vspace*{\skip4}
358 \begin{center}%
359 \MakeTextUppercase{\@title} \par%
360 \vskip\skip1%
361 %

```

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

```

362 A \@work \par%
363 \vskip\skip1%
364 Submitted to the Graduate School \\\
365 of the University of Notre Dame \\\

```



```

366         in Partial Fulfillment of the Requirements \\
367         for the Degree of \par
368     \vskip\skip1%
369     \@degaward%
370     \vskip\skip1%
371     by \\%
372 %

```

Now format the author's name.

```

373     \@author
374 %

```

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.

```

375     \ifadvisors@two
376         \vskip\skip2
377         \hspace*{2.75in}\underline{\hspace{2.75in}}\\%
378         \hspace*{2.75in}\@advisor, Co-Director\\
379     \else
380         \vskip\skip3
381         \hspace*{2.75in}\underline{\hspace{2.75in}}\\%
382         \hspace*{2.75in}\@advisor, Director\\
383     \fi%
384 %

```

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

```

385 \ifadvisors@two %
386     \vskip\double@skip%
387     \hspace*{2.75in}\underline{\hspace{2.75in}}\\%
388     \hspace*{2.75in}\@secondadvisor, Co-Director\\
389 \fi
390 %

```

We end with the department and date; the internal spacing is chosen so that these are at the page bottom.

```

391     \vskip\skip1%
392     Graduate Program in \@department \\%
393     Notre Dame, Indiana \\
394     \@degdate
395     \end{center}
396     \end{titlepage}%
397 }
398 %

```

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

```

399 \newenvironment{copyrightpage}{%
400     \clearemptydoublepage
401     \typeout{Copyright page}
402     \pagestyle{empty}

```

```

403 \null\vfil
404 \begin{center}\normalspacing}%
405 { \end{center}\vfil\null \clearpage }
406 %

```

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

```

407 \newcommand{\@copyrightyear}{\the\year}
408 \newcommand{\@copyrightholder}{\@author}
409 \newcommand{\@copyrightlicense}{All Rights Reserved}
410 \newcommand{\copyrightyear}[1]{\renewcommand{\@copyrightyear}{#1}}
411 \newcommand{\copyrightholder}[1]{\renewcommand{\@copyrightholder}{#1}}
412 \newcommand{\copyrightlicense}[1]{\renewcommand{\@copyrightlicense}{#1}}
413 %

```

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

```

414 \newcommand{\makecopyright}{%
415 \ifdiss@final
416 \begin{copyrightpage}
417 \normalfont\normalsize
418 \copyright\space Copyright by \\
419 \@copyrightholder \\
420 \@copyrightyear\\
421 \@copyrightlicense \\[10mm]
422 \end{copyrightpage}
423 \fi
424 }%
425 %

```

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

```

426 \newcommand{\makepublicdomain}{%
427 \ifdiss@final
428 \begin{copyrightpage}
429 This document is in the public domain.
430 \end{copyrightpage}
431 \fi
432 }%
433 %

```

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.

```

434 \providecommand{\abstractname}{Abstract}
435 \providecommand{\dedicationname}{\mbox{}}
436 \providecommand{\prefacename}{Preface}
437 \providecommand{\acknowledgename}{Acknowledgments}
438 \providecommand{\symbolsname}{Symbols}
439 \renewcommand{\tablename}{Table}

```

```

440 \renewcommand{\figurename}{Figure}
441 \renewcommand{\partname}{Part}
442 \renewcommand{\chaptername}{Chapter}
443 \renewcommand{\appendixname}{Appendix}
444 \renewcommand{\contentsname}{Contents}
445 \renewcommand{\listfigurename}{Figures}
446 \renewcommand{\listtablename}{Tables}
447 \renewcommand{\bibname}{Bibliography}
448 \renewcommand{\indexname}{Index}
449 %

```

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

```

450 \newenvironment{abstract}{%
451   \ifboolexpr{bool{pdf} or bool{xetex} or bool{luatex}}{%
452     \pdfbookmark[0]{\abstractname}{abstract}%abstract.0
453   }{}
454   \typeout{Abstract page(s)}
455   \renewcommand{\@oddfoot}{\@empty}
456   \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.

```

457   \let\@evenhead\@oddhead
458   \renewcommand{\@oddhead}{\hfil{\upshape\@author}}
459   \titlepage
460   \null
461   \begin{center}
462     \vspace*{36pt}
463     {\normalsize\mdseries \normalspacing
464       \MakeTextUppercase{\@title} \\[3.5ex]
465       \normalsize\abstractname \[1.5ex] by \[1.5ex] \@author\space}%
466     \@endparpenalty \@M
467   \end{center}\par}%
468 {\par\vfil\null\endtitlepage}
469 %

```

**dedication** The dedication environment is similar to the `abstract` environment. This page is numbered 2 and the subsequent pages are numbered accordingly. A `pdfbookmark` is not created because of a reported issue that Adobe products have with `pdfbookmarks` containing an `\mbox`.

```

470 \newenvironment{dedication}{%
471   \global\dis@d@ed@icationtrue
472   \typeout{Dedication page}
473   \chapter*{\dedicationname}%
474   \thispagestyle{plain}
475   \setcounter{page}{2}
476   \null\centering}
477 {\par\null\clearpage}%
478 %

```

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

```

479 \renewcommand\tableofcontents{%
480   \ifdiss@dedication\relax\else\setcounter{page}{2}\fi
481   \chapter*{\contentsname}%
482   \ifboolexpr{bool{pdf} or bool{xetex} or bool{luatex}}{%
483     \pdfbookmark[0]{\contentsname}{contents}%contents.0
484   }{}
485   \singlespacing
486   \@starttoc{toc}%
487   \normalspacing
488 }
489 %

```

**\listoffigures** 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.

**\listoftables**

```

490 \renewcommand\listoffigures{%
491   \chapter*{\listfigurename}%
492   \addcontentsline{toc}{chapter}{\listfigurename}%
493   \typeout{List of figures - \listfigurename}
494   \singlespacing
495   \@starttoc{lof}%
496   \normalspacing
497 }
498 %
499 \renewcommand\listoftables{%
500   \chapter*{\listtablename}%
501   \addcontentsline{toc}{chapter}{\listtablename}%
502   \typeout{List of tables - \listtablename}
503   \singlespacing
504   \@starttoc{lot}%
505   \normalspacing
506 }
507 %

```

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

**acknowledgement**

```

508 \newenvironment{preface}{%
509   \typeout{Preface page}
510   \chapter*{\prefacename}
511   \addcontentsline{toc}{chapter}{\prefacename}%
512 }%
513 {\par\null\clearpage}%
514 %
515 \newenvironment{acknowledge}{%
516   \typeout{Acknowledgment page}
517   \chapter*{\acknowledgename}

```

```

518 \addcontentsline{toc}{chapter}{\acknowledgename}%
519 }%
520 {\par\null\clearpage}%
521 %

```

`\unnumchapter` Allows the user to create unnumbered chapters that appear in the TOC.

```

522 \newcommand\unnumchapter[1]{%
523 \chapter*{#1}%
524 \addcontentsline{toc}{chapter}{#1}}

```

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

```

525 \newcommand{\sym}[2]{\ensuremath{#1} & #2 \\\}
526 \newenvironment{symbols}[1][r1]{%
527 \typeout{Symbols page}
528 \chapter*{\symbolsname}%
529 \addcontentsline{toc}{chapter}{\symbolsname}%
530 \begin{center}\begin{longtable}{#1}}%
531 {\end{longtable}\end{center}\par\null}
532 %

```

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 the same as that in the `book` class.

```

533 \def\@chapter[#1]#2{
534 \ifnum \c@secnumdepth >\m@ne
535 \if@mainmatter
536 \refstepcounter{chapter}%
537 \typeout{\MakeTextUppercase{\@chapapp\space\thechapter.}}%
538 \addcontentsline{toc}{chapter}%
539 {{\@chapapp\ \thechapter: #1}}%
540 \else
541 \addcontentsline{toc}{chapter}{#1}%
542 \fi
543 \else
544 \addcontentsline{toc}{chapter}{#1}%
545 \fi
546 \chaptermark{#1}%
547 \addtocontents{lof}{\protect\addvspace{10\p@}}%
548 \addtocontents{lot}{\protect\addvspace{10\p@}}%
549 \@makechapterhead{\MakeTextUppercase{#2}}%
550 \@afterheading }%
551 %

```

Modify part definition in `\@part` and `\@spart` to keep the font size for part headings `\normalsize` and `\mdseries`. It is otherwise the same as in the `book` class.

```

552 \def\@part[#1]#2{%
553 \ifnum \c@secnumdepth >-2\relax

```

```

554 \refstepcounter{part}%
555 \addcontentsline{toc}{part}{\thepart\hspace{1em}#1}%
556 \else
557 \addcontentsline{toc}{part}{#1}%
558 \fi
559 \markboth{}{}%
560 {\centering
561 \interlinepenalty \@M
562 \normalfont
563 \ifnum \c@secnumdepth >-2\relax
564 \normalsize\mdseries \partname\nobreakspace\thepart
565 \par
566 \vskip 20\p@
567 \fi
568 \normalsize\mdseries \MakeTextUppercase{#2}\par}%
569 \@endpart}
570 \def\@spart#1{%
571 {\centering
572 \interlinepenalty \@M
573 \normalfont
574 \normalsize\mdseries #1\par}%
575 \@endpart}
576 %

```

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.

```

577 \renewcommand{\@makechapterhead}[1]{%
578 \vspace*{30pt}%
579 {\parindent \z@ \raggedright
580 \ifnum \c@secnumdepth >\m@ne
581 \normalfont\normalsize%
582 \if@mainmatter
583 \ifcentered@chaptitle\center\else\relax\fi%
584 \MakeTextUppercase{\@chapapp{} \thechapter}\par\nobreak
585 \fi
586 \fi
587 \interlinepenalty\@M
588 \ifcentered@chaptitle\center\else\relax\fi%
589 \mdseries{#1}\par\nobreak
590 \vskip 30\p@
591 }}
592 %

```

**\@makeschapterhead** Make the TOC, LOF, LOT and other `\chapter*` headings in normal size, and `\mdseries` by modifying the macro `\@makeschapterhead`. Although these heading labels usually fit

in a single-line, we copy the formatting for the chapter heading label (single-spacing) and make the spacing double again for the text.

```

593 \renewcommand{\@makeschapterhead}[1]{%
594   \vspace*{30pt}%
595   {\parindent \z@ \raggedright
596     \normalfont\normalsize%
597     \interlinepenalty\M
598     \ifcentered@chaptitle\center\else\relax\fi
599     \mdseries{\MakeTextUppercase{#1}}\par\nobreak
600     \vskip 30\p@
601   }}
602 %

```

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`.

```

603 \renewcommand\section{\suppressfloats[t]%
604   \@startsection {section}{1}{\z@}%
605   {-4.2ex \@plus -1ex \@minus -.2ex}%
606   {1.8ex \@plus .2ex}%
607   {\normalfont\normalsize\mdseries} }
608 \renewcommand\subsection{\suppressfloats[t]%
609   \@startsection{subsection}{2}{\z@}%
610   {-3.9ex\@plus -1ex \@minus -.2ex}%
611   {1.2ex \@plus .2ex}%
612   {\normalfont\normalsize\mdseries} }
613 \renewcommand\subsubsection{\suppressfloats[t]%
614   \@startsection{subsubsection}{3}{\z@}%
615   {-3.9ex\@plus -1ex \@minus -.2ex}%
616   {1.2ex \@plus .2ex}%
617   {\normalfont\normalsize\mdseries} }
618 \renewcommand\paragraph{%
619   \@startsection{paragraph}{4}{\z@}%
620   {3.9ex \@plus 1ex \@minus .2ex}%
621   {-1em}%
622   {\normalfont\normalsize\mdseries} }
623 \renewcommand\subparagraph{%
624   \@startsection{subparagraph}{5}{\parindent}%
625   {3.9ex \@plus 1ex \@minus .2ex}%
626   {-1em}%
627   {\normalfont\normalsize\mdseries} }
628 %

```

`\l@part` Modify the macro `\l@part` that formats part 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 less space between each part and the last section entry than the default and don't change the font.

```

629 \renewcommand*\l@part[2]{%
630   \ifnum \c@tocdepth >-2\relax
631     \addpenalty{-\@highpenalty}%

```

```

632 \setlength\@tempdima{1.5em}%
633 \begingroup
634 {\leavevmode
635 \@dottedtocline{1}{0pt}{\@tempdima}{#1}{#2}
636 }\par
637 \nobreak
638 \global\@nobreaktrue
639 \everypar{\global\@nobreakfalse\everypar{}}%
640 \endgroup
641 \fi}
642 %

```

**\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 less space between each chapter and the last section entry than the default.

```

643 \renewcommand*\l@chapter}[2]{%
644 \addpenalty{-\@highpenalty}%
645 \setlength\@tempdima{1.5em}%
646 \begingroup \leavevmode
647 \@dottedtocline{1}{0pt}{\@tempdima}{#1}{#2}
648 \par
649 \penalty\@highpenalty
650 \endgroup
651 }
652 %

```

**\thesubsubsection** We 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.

```

653 \addtocounter{secnumdepth}{1}
654 \addtocounter{tocdepth}{1}
655 \renewcommand{\thesubsubsection}{%
656 \thesubsection.\arabic{subsubsection}}
657 %

```

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

```

658 \renewenvironment{quote}
659 {\list{}{\rightmargin\leftmargin}%
660 \singlespacing
661 \item\relax}
662 {\endlist}
663 %

```

**itemize** Redefine the **itemize** environment so that each item is single-spaced, but with a line of space between each item.

```

664 \let\realitemize\itemize
665 \let\endrealitemize\enditemize
666 \renewenvironment{itemize}

```



```

667      {\realitemize
668        \singlespacing}
669      {\endrealitemize
670        \doublespacing}

itemize

enumerate  Redefine the enumerate environment so that each item is single-spaced, but with a line of
              space between each item. Note we need the optional argument in order to be compatible
              with the enumerate package

671 \let\realenumerate\enumerate
672 \let\endrealenumerate\endenumerate
673 \renewenvironment{enumerate}[1][1.]
674      {\realenumerate[#1]
675        \singlespacing}
676      {\endrealenumerate
677        \doublespacing}

enumerate

description Redefine the description environment so that each item is single-spaced, but with a
              line of space between each item.

678 \let\realdescription\description
679 \let\endrealdescription\enddescription
680 \renewenvironment{description}
681      {\realdescription
682        \singlespacing}
683      {\endrealdescription
684        \doublespacing}

description 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.

685 \setlength\abovecaptionskip{20\p@}
686 \newlength\capwidth
687 \setlength{\capwidth}{0.90\textwidth}
688 \newlength\abovetableskip
689 \newlength\belowtableskip
690 \newlength\abovefigureskip
691 \newlength\belowfigureskip
692 \setlength\abovetableskip\belowcaptionskip
693 \setlength\belowtableskip\abovecaptionskip
694 \setlength\abovefigureskip\abovecaptionskip
695 \setlength\belowfigureskip\belowcaptionskip
696 %

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.

697 \renewenvironment{figure}{%
698   \setlength{\abovecaptionskip}{\abovefigureskip}

```

```

699 \setlength{\belowcaptionskip}{\belowfigureskip}
700 \let\@makecaption\@makefigurecaption
701 \@float{figure}}%
702 {%
703 \addtocontents{lof}{\vskip 0.4em} }%
704 \end@float%
705 }
706 %

```

**\@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.

```

707 \long\def\@makefigurecaption#1#2{%
708 \vskip\abovecaptionskip
709 \begin{center}
710 \parbox{\capwidth}{
711 \centering\singlespacing
712 {#1}. {#2}%\par
713 \vskip\belowcaptionskip\normalspacing }%
714 \end{center}
715 }%
716 %

```

**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 are 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.

```

717 \renewenvironment{table}[1][tbp]{%
718 \setlength{\abovecaptionskip}{\abovetableskip}
719 \setlength{\belowcaptionskip}{\belowtableskip}
720 \renewcommand{\arraystretch}{\double@baselinestretch}
721 \let\scaption\caption%
722 \renewcommand*{\caption}[2][ ]{%
723 \ifthenelse{\equal{##1}{}}{%
724 \def\shortcaption{##2}%
725 }{%
726 \def\shortcaption{##1}%
727 }%
728 \scaption[\shortcaption]{\MakeTextUppercase{##2}}%
729 }%
730 \let\@makecaption\@maketablecaption
731 \@float{table}[#1]%
732 \singlespacing%
733 }%
734 {%
735 \addtocontents{lot}{\vskip 0.4em} }%
736 \end@float%
737 }
738 %

```

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

```

739 \long\def\@maketablecaption#1#2{
740   \vskip\abovcaptionskip
741   \begin{center}
742     \makebox[\linewidth]{
743       \parbox{\capwidth}{
744         \centering\normalspacing
745         \MakeTextUppercase{#1}\[\single@skip]
746         {#2}%\par
747       \vskip\belowcaptionskip }%
748     }%
749   \end{center}
750 }
751 %

```

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

```

752 \renewcommand\longtable{%
753   \singlespacing
754   \renewcommand{\arraystretch}{\double@baselinestretch}
755   \begingroup
756   \@lfirstcaptiontrue
757   \@ifnextchar[\LT@array{\LT@array[x]}}
758 %

```

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

```

759 \renewcommand\endlongtable{%
760   \crrc
761   \noalign{%
762     \let\LT@entry\LT@entry@chop
763     \xdef\LT@save@row{\LT@save@row}}%
764   \LT@echunk
765   \LT@start
766   \unvbox\z@
767   \LT@get@widths
768   \if@files
769     {\let\LT@entry\LT@entry@write\immediate\write\@auxout{%
770       \gdef\expandafter\noexpand
771         \csname LT@\romannumeral\c@LT@tables\endcsname
772         {\LT@save@row}}}%
773   \fi
774   \ifx\LT@save@row\LT@save@row
775   \else
776     \LT@warn{Column \@width s have changed\MessageBreak
777       in table \thetable}%
778     \LT@final@warn
779   \fi
780   \endgraf\penalty -\LT@end@open

```

```

781 \addtocontents{lot}{\vskip 0.4em} }%
782 \endgroup
783 \global\@mparbottom\z@
784 \pagegoal\vsize
785 \endgraf\penalty\z@\addvspace\LTpost
786 \ifvoid\footins\else\insert\footins{}\fi
787 }
788 %

```

**\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`.

```

789 \setlength{\LTcapwidth}{\capwidth}
790 \renewcommand\LT@makecaption[3]{%
791 \LT@mcot\LT@cols c{\hbox to\z@{\hss\parbox[t]{\LTcapwidth{%
792 \vskip\abovetableskip%
793 \centering\normalspacing
794 \if@ltfirstcaption
795 #1{\MakeTextUppercase{#2} }\\[\single@skip]
796 \MakeTextUppercase{#3}\par
797 \else%
798 #1{\MakeTextUppercase{#2 (continued)}} \par
799 \fi
800 \global\@ltfirstcaptionfalse
801 \endgraf\vskip\belowtablesip}%
802 \hss}}}
803 %

```

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

```

804 \newcommand\timenow{%
805 \@tempcnta=\time \divide\@tempcnta by 60 \number\@tempcnta:\multiply
806 \@tempcnta by 60 \@tempcntb=\time \advance\@tempcntb by -\@tempcnta
807 \ifnum\@tempcntb <10 0\number\@tempcntb\else\number\@tempcntb\fi}
808 %

```

**\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.

```

809 \newcommand{\diss@header}{%
810 \ifdiss@review Review \else Draft \fi document [\today/ at \timenow/]
811 }%
812 %

```

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

```

813 \ifdiss@final
814 \renewcommand{\ps@plain}{
815 \renewcommand{\@oddhead}{\@empty}
816 \renewcommand{\@oddfoot}{\hfil\thepage\hfil}
817 \let\@evenhead\@oddhead

```

```

818      \let\@evenfoot\@oddfoot
819    }%
820 \else
821   \renewcommand{\ps@plain}{
822     \renewcommand{\@oddhead}{\framebox[\textwidth]{
823       \centering\footnotesize\tt\diss@header}}%
824     \renewcommand{\@oddfoot}{\hfil\textrm{\thepage}\hfil}
825     \let\@evenhead\@oddhead
826     \let\@evenfoot\@oddfoot
827   }%
828   \renewcommand{\ps@empty}{
829     \renewcommand{\@oddhead}{\framebox[\textwidth]{
830       \centering\footnotesize\tt\diss@header}}%
831     \renewcommand{\@oddfoot}{\@empty}
832     \let\@evenhead\@oddhead
833     \let\@evenfoot\@oddfoot
834   }%
835 \fi
836 %

```

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

```

837 \renewcommand{\bibsection}{
838   \chapter*{\bibname}%
839   \addcontentsline{toc}{chapter}{\bibname}%
840 }%
841 %

```

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

```

842 \renewcommand{\bibfont}{\singlespacing}
843 \ifnum@refs
844   \renewcommand{\@biblabel}[1]{\hfill#1.\hfill}
845 \fi
846 %

```

Lastly, after the bibliography in the final document, add a framed box which contains a blurb about the typesetting program and `NDDiss2ε` version used for preparing the dissertation document.

```

847 \ifdiss@final
848 \AtEndDocument{
849   \vfill
850   \centering\singlespacing
851   \framebox[0.85\textwidth]{
852     \begin{minipage}{0.80\textwidth}\footnotesize%
853       \centering \itshape This document was prepared \& typeset with
854       \upshape
855       \ifluatex

```

```

856     \LuaLaTeX
857     \else\ifxetex
858         \XeLaTeX
859     \else\ifpdf
860         pdf\LaTeX
861     \else
862         \LaTeXe
863     \fi\fi\fi
864     \itshape , and
865     formatted with \upshape\nddiss\xspace\itshape classfile
866     (v\disssfileversion [\disssfiledate])
867     \end{minipage} }
868     \clearpage}
869 \else\relax\fi
870 %
871 % \endinput
872 % End of file 'nddiss2e.cls'.

```

## Change History

v0.98		changes in documentation, and
General: Initial <i>beta</i> version . . . . .	1	addition of support for parts. -
v1.0		MP . . . . . 1
Release: First release . . . . .	1	v3.2013 $\beta$
v1.1		Release: Initial release of updates
General: Minor changes and		in order to comply with the
clean-up . . . . .	1	Graduate School's current
v2.0		formatting regulations and to
General: Some bugfixes, cleaned		take advantage of some LaTeX
some of documentation . . . . .	1	package updates. Should be
v2.1		functional, and has been
General: More bugfixes, changes in		approved by the
documentation . . . . .	1	Dissertation/Thesis editors,
v3.0		but has not undergone
Release: Major revamp and		wide-scale testing. - Megan
clean-up of the code, added		Patnott . . . . . 1
<b>numrefs</b> and <b>textrefs</b> to allow		v3.2016
different kinds of citation		Release: Fix natbib/showkeys
styles, added some more		ordering bug . . . . . 1
macros and modified others,		v3.2017.1
changed the titlepage a bit,		Release: Display (CONTINUED)
completed source		on multipage long table
documentation . . . . .	1	captions . . . . . 1
v3.2013		
Release: Some bug fixes, minor		