The **nuthesis** class*

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Abstract

The nuthesis class is designed to make following the guidelines in the University of Nebraska-Lincoln Guidebook For Preparing a Thesis or Dissertation [13, 12] straightforward. As the rules should be nearly identical on the other NU^1 campus (Kearney, the Medical Center, and Omaha) an effort has been made to allow the class file to be used on those campus.

1 Usage

Please note that nuthesis requires memoir, setspace, geometry and scrtime from KOMA-script.

1.1 Class options

The nuthesis is designed to be a "drop in" replacement for the report document class. As with any LATEX class, there are a number of optional arguments that are available to the class.

The default options for this class are double, electronic and phd.

single double The options single and double control the spacing in most of the document. For example, the abstract *must* be double spaced and the option single does not affect it.

print electronic

With the move towards electronic submissions, we have an electronic option that sets up the thesis for this. Currently, the difference between electronic and print, is print adds extra spacing to the margins to allow for binding.

^{*}This document corresponds to nuthesis v0.7.1, dated 2013/05/23.

[†]Prof. Allan Donsig and the author wrote the original unlthesis, on which this class is loosely based.

¹Hence the name of the class.

phd edd ms For the most common degrees that will be using this class, we have options that allow several title page elements to be set as a group. A listing of what is set by each option is shown in Table 1. The description of the lower level commands that do the real work, is found in §1.2.1.

Table 1: Pre-defined options for the title page.

		-	1 0
Option	Document type	Degree	Degree Abbreviation
phd	Dissertation	Doctor of Philosophy	Ph.D.
edd	Dissertation	Doctor of Education	Ed.D.
ms	Thesis	Master of Science	M.S.
ma	Thesis	Master of Art	M.A.

draft

As you will no doubt be printing multiple copies of your thesis, a draft option has been provided, similar to that of [4]. The purpose of this option is to print in the header the date and time that the file was LATEXed.

testing

The testing option is used to print out a frame showing the margin and header placement on the first page of the document.

One gets started, like any other $\mbox{\sc IAT}_{\mbox{\sc EX}}\mbox{\sc document:}$

Start of code	
23420 02 0340	
\documentclass[print]{nuthesis}	
End of Code	

The above example will set up formatting for a double spaced, print ready dissertation for a Ph.D. (phd, double are default options, not overridden here).

1.2 Title page

\title
\author
\adviser
\adviserAbstract
\major
\degreemonth
\degreeyear

The usage of this group of commands should be self-explanatory from usage of title and author in the standard IATEX classes. The extra ones are part of the collection of macros needed to typeset the title and abstract pages.

 $\verb|\adviserAbstract| is to typest your adviser(s) names without titles, i.e., "Professor" for the abstract.$

Note: title and doctype are automatically made uppercase, this can not be overridden, as it's required by guidebook.

After the preamble you should have:

Start	of	code

\begin{document}

%% Start formatting the first few special pages

%% frontmatter is needed to set the page numbering correctly
\frontmatter

\title{A Very Good Thesis}
\author{You}
\adviser{Professor Someone}
\adviserAbstract{Someone}
\major{Something}
\degreemonth{Month}
\degreeyear{Year}

_ End of Code _____

Note: \adviser and \adviserAbstract are a "dumb" macros in that they have only one argument. If you happen to have Co-advisers, you need to enter both names here, just as you (or Grad Studies) want them to appear. For example:

% \adviser{Professor Donald~E. Knuth and Professor Leslie Lamport}
% \adviserAbstract{Donald~E. Knuth and Leslie Lamport}
End of Code

\college \university \city \state This group is part of the collection of macros that allow the user to enter information needed to typeset the title and abstract pages.

For what **\college** should be set to depends on the college you will be graduating from. For graduate students: "Graduate College" for undergraduates: "College of Arts & Sciences", . . .

Note: \college, \university, \campus, \city, and \state are pre-set to "Graduate College", "University of Nebraska", "Lincoln", and "Nebraska" respectively. Each of these can be easily overridden, by uncommenting the commands in the following example and specifying what they should be.

1.2.1 Degree information

\doctype \degree \degreeabbreviation This is the final group of the collection of macros that allow the user to enter information needed to typeset the title and abstract.

As these can be set all at once for the most common degrees with an option to the nuthesis, see Table 1. If you have a different degree uncomment the following commands and specify the correct information

	\doctype is used to set the type of document we are working with (typically a thesis or a dissertation).	
	Start of code	
	%% \doctype{Thesis or Dissertation} %% \degree{Your degree}	
	<pre>%% \degreeabbreviation{Your degree abbr.}</pre>	
	End of Code	
	1.3 Other front matter	
abstract copyrightpage dedication acknowledgments	Here is the collection on environments that can be used to typeset a number of common elements typically found in a thesis. The abstract is the only required one.	
grantinfo	Start of code	
	%% Required	
	\begin{abstract}	
	Abstract goes here.	
	\end{abstract}	
	%% Optional	
	<pre>%% \begin{copyrightpage}</pre>	
	%% \end{copyrightpage}	
	%% Optional	
	<pre>%% \begin{dedication}</pre>	
	<pre>%% \end{dedication}</pre>	
	%% Optional	
	<pre>%% \begin{acknowledgments}</pre>	
	%% \end{acknowledgments}	
	%% Optional	
	<pre>%% \begin{grantinfo}</pre>	
	%% \end{grantinfo}	
	End of Code	
\tableofcontents \listoffigures \listoftabels	Here is the collection on commands that can be used to typeset a number of common elements typically found in a thesis. The \tableofcontents is the only required one.	
	Start of code	

%% The ToC is required
%\tableofcontents
%% Uncomment these if need be
% \listoffigures
% \listoftables
________ End of Code

1.4 The rest

Now that all the front matter is set up, it's time to start on the main part of the thesis.

You must use $\mbox{\tt mainmatter}$ before you start the main body of your thesis, else the page numbering will be wrong.

Once you are at the end of your main body, you *must* use \backmatter before you start the Appendices with \appendix for your thesis, or the section formatting will be wrong.

Start of code
<pre>%% mainmatter is needed after the ToC, (LoF, and LoT) to set the %% page numbering correctly for the main body \mainmatter</pre>
%% Thesis goes here
\chapter{My Thesis}
<pre>%% backmatter is needed at the end of the main body of your thesis to %% set up page numbering correctly for the remainder of the thesis \backmatter</pre>
%% Start the correct formatting for the appendices \appendix
%% Appendices go here (if you have them)
<pre>%% Bibliography goes here (You better have one) %% BibTeX is your friend</pre>
<pre>%% Index go here (if you have one) \end{document} Find of Code</pre>

2 Implementation

We use the memoir [18] as the base for nuthesis. Simply because it had most of what was needed and it was easy to add the missing features.

2.1 Initial code

Load three of the four needed packages (We load geometry later.) We use setspace to handle single/double spacing correctly. From the KOMA-script bundle, we use scrtime to use \thistime for the running headers in draft mode.

The packages [16, 8, 17] should be already installed with most TeX distributions. If [3, 2] are not installed, then there is something wrong as they are required packages.

- 1 \RequirePackage{ifthen}
- 2 \RequirePackage{keyval}
- 3 \RequirePackage{setspace}
- 4 \RequirePackage{scrtime}

We also define a couple of boolean variables that are needed by class options.

- 5 \newboolean{nu@print}
- 6 \newboolean{nu@single}

2.1.1 Building blocks

To typeset the title page with all the non-standard title page items, we need to set them up.

\doctype

To allow for either a thesis or a dissertation, we allow give the user the ability to set it.

- 7 \newcommand{\doctype}[1]{%
- 8 \gdef\nu@doctype{#1}}
- 9 \newcommand{\nu@doctype}{}

\degree \degreeabbreviation

Set up macros for the user to enter the full degree name eg "Doctor of Evil" along with the abbreviation "M.D." for use on the title and abstract pages.

- 10 \newcommand{\degree}[1]{%
- 11 \gdef\nu@degree{#1}}
- 12 \newcommand{\nu@degree}{}
- 13 \newcommand{\degreeabbreviation}[1]{%
- 14 \gdef\nu@degreeabbreviation{#1}}
- $15 \ensuremath{\label{lem:lem:nu@degreeabbreviation}{}} \\$

Set up the major, college, university, and city. We also set a couple of defaults, viz city=Lincoln, state=Nebraska, college=Graduate College, \college university=University of Nebraska and campus=unl. \university \city 16 \newcommand{\major}[1]{% \state \gdef\nu@major{#1}} $18 \newcommand{\nu@major}{}$ 19 \newcommand{\college}[1]{% \gdef\nu@college{#1}} 21 \newcommand{\nu@college}{Graduate College} 22 \newcommand{\university}[1]{% \gdef\nu@university{#1}} 24 \newcommand{\nu@university}{University of Nebraska} 25 \newcommand{\city}[1]{% \gdef\nu@city{#1}} 27 \newcommand{\nu@city}{Lincoln} 28 \newcommand{\state}[1]{% \gdef\nu@state{#1}}

\adviserAbstract

Define the macros needed to get the the name(s) and title(s) of one's adviser(s) for the title and abstract pages. Two macros are needed, as they have to be formated differently. These are both "dumb" macros in that they have only one argument. It's more trouble that it's worth to have LATEX be clever and "do the right thing" as there is to much variation in how to "correctly" list co-advisers.

```
31 \newcommand{\adviser}[1]{%
    \gdef\nu@adviser{#1}}
33 \newcommand{\adviserAbstract}[1]{%
    \gdef\nu@adviserAbstract{#1}}
35 \newcommand{\nu@adviser}{}
36 \newcommand{\nu@adviserAbstract}{}
```

30 \newcommand{\nu@state}{Nebraska}

\degreemonth

Set up macros for the user to enter the information for when the final exam took \degreeyear place or when the degree is conferred.

```
37 \newcommand{\degreemonth}[1]{%
   \gdef\nu@month{#1}}
39 \newcommand{\nu@month}{}
40 \newcommand{\degreeyear}[1]{%
   \gdef\nu@year{#1}}
42 \newcommand{\nu@year}{}
```

2.2 **Declaration of Options**

This option is used to check settings, by printing out the frame on the title page. This frame shows the layout and positioning of the margins along with the header. All testing does is append showframe to the list of options that are passed to geometry.

```
43 \DeclareOption{testing}{%
44 \PassOptionsToPackage{showframe}{geometry}
45 }
```

double

The options single and double control the the spacing of the document, where we can. We only want to make changes at the beginning of the document so, using \AtBeginDocument we test these booleans set by these options and do the right thing.

```
46 \DeclareOption{single}{%
47 \setboolean{nu@single}{true}
48 }
49
50 \DeclareOption{double}{%
51 \setboolean{nu@single}{false}
52 }
```

print These options don't do much, because they don't really need to. All print does is electronic append bindingoffset=0.5in to the list of options that are passed to geometry.

```
53 \DeclareOption{print}{%
54  \setboolean{nu@print}{true}
55  \PassOptionsToPackage{bindingoffset=0.5in}{geometry}
56 }
```

At the moment electronic is provided for symmetry and does nothing.

```
57 \DeclareOption{electronic}{%
58 \relax
59 }
```

For the most common degrees that will be using this class, we have options that allow several title page elements to be sent as a group. A listing of what is defined by each option is shown in table 1. For implementation details on the lower level commands that do the real work, please see §2.1.1.

```
60 \DeclareOption{phd}{%
61  \doctype{Dissertation}
62  \degree{Doctor of Philosophy}
63  \degreeabbreviation{Ph.D.}
64 }
65
66 \DeclareOption{edd}{%
67  \doctype{Dissertation}
68  \degree{Doctor of Education}
69  \degreeabbreviation{Ed.D.}
```

```
70 }
71
72 \DeclareOption{ms}{%
    \doctype{Thesis}
73
    \degree{Master of Science}
74
    \degreeabbreviation{M.S.}
75
76 }
77
78 \DeclareOption{ma}{%
    \doctype{Thesis}
79
    \degree{Master of Art}
80
    \degreeabbreviation{M.A.}
81
82 }
   Allow options be passed from our class to memoir.
83 \DeclareOption*{%
   \PassOptionsToClass{\CurrentOption}{memoir}
85 }
```

2.3 Execution of options

We don't do anything fancy here other than set the default option to be double, electronic and phd.

```
86 \ExecuteOptions{double,electronic,phd}
87 \ProcessOptions
```

2.4 Package Loading

We load memoir with some common default options.

```
88 \LoadClass[12pt,oneside] {memoir}
```

For reasons I'm not sure of, if geometry is moved to where the rest of packages are loaded, it yells at me. So, we load it here.

Load geometry with a number of options. To follow the rules in [13, 12], we set

letterpaper we are in the US

margin=1in the minimum margins allowed. An bindingoffset=0.5in option is joined to this list of options by the class option print.

includehead is used to include the header into the textarea calculation so the margins are correct

nofoot as we do not have footers

2.5 Main Code

2.5.1 Page Styles

According to [13, 12]:

Except for the title page and abstract, number all pages in your ETD.

Number the pages in the front matter with small roman numerals (i, ii, iii, iv, etc.), placed at the upper right of the page. However, the page number for the Title Page (i) and the pages of the Abstract (ii...) should not appear on the page(s).

Number all pages through the body and back matter with Arabic numerals (1, 2, 3, etc.). You should number these pages at the upper right.

 $\label{lem:nuquagestyle} {\tt nuquagestyleDraft}$ {\tt nuquagestyleDraft} So this is what we set up here. memoir's default options take care of the lower roman to Arabic for us, if \frontmatter, \mainmatter, and \backmatter are used.

Borrowing and idea from [4], we define nu@pagestyleDraft which prints out the date and time the file was processed by LATEX.

Even though the guidebook calls for one-sided documents, the page sytle has been set up to handle two-sided printing, if that option is passed into the class. We don't define the two side option, memor handles that for us.

Check to see if we are in draft mode, if so, set the page styles to use nu@pagestyleDraft, else use the default. Set the pagestyles plain and empty to be an alias for nu@pagestyle.

```
101 \ifdraftdoc
102 \aliaspagestyle{plain}{nu@pagestyleDraft}
103 \aliaspagestyle{empty}{nu@pagestyleDraft}
```

```
104 %% \aliaspagestyle{cleared}{nu@pagestyleDraft} 105 \pagestyle{nu@pagestyleDraft}
```

Just like for the draft option, we set the pagestyle plain as an alias for nu@pagestyle so pages that start chapters are formatted correctly. But we leave empty alone, as we need some pages to have an empty page style.

```
106 \else
107 \aliaspagestyle{plain}{nu@pagestyle}
108 %% \aliaspagestyle{cleared}{nu@pagestyle}
109 \pagestyle{nu@pagestyle}
110 \fi
```

2.5.2 Front matter

Here's our collection of re-defining commands and environments needed for the typesetting the front matter.

maketitle Most of the following is straight forward, just a lot of trial and error in figuring the spacing between different elements.

```
111 \renewcommand{\maketitle}{%
112 \begin{center}%
```

We use \singlespacing for simplicity in our calculation of spacing to mimic the look of the sample title page in [13]

```
113 \MakeUppercase{\thetitle}\\[1\baselineskip]
114 \singlespacing
115 by \\[2\baselineskip]
116 \theauthor\\[4\baselineskip]
117 \MakeUppercase{A \nu@doctype}\[4\baselineskip]
118 Presented to the Faculty of \\[\baselineskip]
119 The \nu@college{} at the \nu@university\\[\baselineskip]
120 In Partial Fulfilment of Requirements\\[\baselineskip]
121 For the Degree of \nu@degree\\[3\baselineskip]
122 Major: \nu@major\\[3\baselineskip]
123 Under the Supervision of \nu@adviser\\[3\baselineskip]
124 \nu@city, \nu@state\\[1\baselineskip]
125 \nu@month, \nu@year
126 \end{center}
127 \thispagestyle{empty}
128 \cleardoublepage
129 }
```

abstract copyrightpage dedication acknowledgments grantinfo

Most of the following is straight forward. Here you see the that many of the commands that capture the information are re-used again.

```
130 \renewenvironment{abstract}{%
     \pagestyle{empty}%
131
     \begin{doublespacing}%
132
133
        \begin{center}%
          \MakeUppercase{\thetitle}\\[.5\baselineskip]
134
135
          \theauthor, \nu@degreeabbreviation\\
          \nu@university, \nu@year%
136
       \end{center}%
137
       \begin{flushleft}%
138
          Adviser: \nu@adviserAbstract%
139
        \end{flushleft}%
140
     }{\par\end{doublespacing}\cleardoublepage}
141
142
143 \newenvironment{copyrightpage}[1][Copyright]{%
     \begin{center}%
144
       \MakeUppercase{#1}\\
145
       \copyright{} \nu@year, \theauthor%
146
147
     \end{center}%
     \label{themelse} $$ \left( boolean\{nu@single\}\}{\login\{singlespacing\}} \right) $$ if the nelse {\loginglespacing}. $$
148
       }{\par%
149
          \ifthenelse{\boolean{nu@single}}{\end{singlespacing}}{\end{doublespacing}}}
150
151
     \cleardoublepage}
152
153 \newenvironment{dedication}[1][Dedication]{%
     \begin{center}%
154
155
       \MakeUppercase{#1}%
156
     \end{center}%
     \ifthenelse{\boolean{nu@single}}{\begin{singlespacing}}{\begin{doublespacing}}}%
157
       }{\par%
158
          \ifthenelse{\boolean{nu@single}}{\end{singlespacing}}{\end{doublespacing}}}%
159
     \cleardoublepage}
160
161
162 \newenvironment{acknowledgments}[1][Acknowledgments]{%
163
     \begin{center}
164
       \MakeUppercase{#1}
165
     \end{center}
     \ifthenelse{\boolean{nu@single}}{\begin{singlespacing}}{\begin{doublespacing}}}%
166
167
       }{\par%
          \ifthenelse{\boolean{nu@single}}{\end{singlespacing}}{\end{doublespacing}}}%
168
     \cleardoublepage}
169
170
171 \newenvironment{grantinfo}[1][Grant Information]{%
     \begin{center}
172
173
       \MakeUppercase{#1}
     \end{center}
174
     \ifthenelse{\boolean{nu@single}}{\begin{singlespacing}}{\begin{doublespacing}}}%
175
176
177
          \ifthenelse{\boolean{nu@single}}{\end{singlespacing}}{\end{doublespacing}}}
```

178

\cleardoublepage}

2.5.3 ToC, LoF, LoT

tableofcontents listoffigures listoftables We want the Table of Contents, List of Figures, and List of Tables all to start on new pages. We we make a "copy" of each before re-defining the commands

```
179 \let\nu@ToC\tableofcontents
180 \renewcommand{\tableofcontents}{\cleardoublepage\nu@ToC}
181
182 \let\nu@LoF\listoffigures
183 \renewcommand{\listoffigures}{\cleardoublepage\nu@LoF}
184
185 \let\nu@LoT\listoftables
186 \renewcommand{\listoftables}{\cleardoublepage\nu@LoT}
```

By default memoir, only numbers sections down to section. For most users this isn't enough. So we reset them.

```
187 \maxsecnumdepth{subsubsection}
188 \setsecnumdepth{subsubsection}
189 \maxtocdepth{subsubsection}
```

2.6 Back matter

backmatter

memoir resets some things in the backmatter that we don't want reset, because of what the guidebook says. So, we redefine it to do nothing.

190 \let\backmatter\relax

2.7 Main matter

Check to see if **single** has been passed as an option to the class. If so turn on single spacing (where we can), if not use double spacing.

```
191 \AtBeginDocument{%
192 \ifthenelse{\boolean{nu@single}}{\singlespacing}{\doublespacing}%
193 }
```

3 Acknowledgements

Thanks to people.

4 Known issues

• For captions, it appears that double spacing does not seem to get applied, but is applied for them in the LoF or LoT.

5 Things to do

- $\bullet \ \ {\rm error\ checking\ of\ mutually\ exclusive\ options\ -\ print/electronic,\ single/double.}$
- error checking that only one of phd, edd, ms, ma can be used at a time
- error checking for undefined options
- \bullet check for existence of *.{eps,pdf} wordmarks for each of the campus
- put required campus wordmarks in a separate folder (needs to be done carefully, to take into account different platforms.

Change History

v0.1	v0.4a
General: Initial version 0.2	General: Changed \textsc back to \MakeUppercase 1
General: \subsubsections now numbered. Thanks to Dave Miller	Cleaned up optional includes 1 Fix signature page to use \nu@doctype 1 Fixed change log to use \cs 1 Fixed missing entries in changelog 1 Included the bibliogrpahy 1 Incorporated thesis-test into dtx
$\begin{array}{cccc} things \ cleaner. & & & 1 \\ v0.3 & & & & \\ General: \ Addition \ the \ of \ signature \\ page. & & & & 1 \\ Clean-up. & & & 1 \end{array}$	file. 1 Lots of minor things fixed/cleaned up. 1 Rewrote documentation. Made changelog. 1 v0.5 1
Fixed headers to work for twoside option	General: DocStrip code wasn't being striped out
v0.4 General: \MakeUppercase to \textsc changed in title page 1	General: Changed documentation to match

v0.6.1	\adviserAbstract: Added to allow
General: Changed options for skele-	for differences in advisers on ti-
ton file, removed "single" 2	tle and abstract pages
v0.7	abstract: Changed environment to
General: Added \adviserAbstract	use \adviserAbstract instead
documentation 2	of \adviser 1

References

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Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

$\begin{array}{cccc} \textbf{A} \\ \text{abstract (environment)} & & 4, \underline{130} \\ \text{acknowledgments (environment)} & & 4, \underline{130} \\ \text{Adviser} & & 2, \underline{31} \\ \text{AdviserAbstract} & & 2, \underline{31} \\ \text{Author} & & & 2 \end{array}$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{c} \mathbf{D} \\ \text{dedication (environment)} & \dots & 4, \underline{130} \\ \text{degree} & \dots & 3, \underline{10}, 62, 68, 74, 80 \\ \text{degreeabbreviation} & 3, \underline{10}, 63, 69, 75, 81 \\ \text{degreemonth} & \dots & 2, \underline{37} \\ \text{degreeyear} & \dots & 2, \underline{37} \\ \text{doctype} & \dots & 3, \underline{7}, 61, 67, 73, 79 \\ \end{array}$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$

$\label{eq:major} $$ \mbox{major}$	\nu@university 23, 24, 119, 136 \nu@year 41, 42, 125, 136, 146
\ms	P
${f N}$	\phd
\nu@adviser 32, 35, 123	\print 1, <u>53</u>
\nu@adviserAbstract 34, 36, 139	${f S}$
\nu@city	\single 1, 46
\nu@degree 11, 12, 121	\state 3, <u>16</u>
$\nu@degreeabbreviation 14, 15, 135$	${f T}$
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