

The mines-thesis class *

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January 10, 2020

Abstract

This package provides a class for graduate students at Colorado School of Mines to prepare their theses and dissertations.

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*This document corresponds to mines-thesis v1.0, dated 2020/01/10.

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1 User's guide

1.1 Installation

1.2 Invocation and options

`\documentclass` The mines-thesis class is invoked in the standard fashion.

```
\documentclass[\langle options \rangle]{mines-thesis}
```

There are several options corresponding to the type of the document and its general appearance. They are described below. Generally speaking, the options have `key=value` forms, for example,

```
\documentclass[screen=true, review=false]{mines-thesis}
```

The default options are `letterpaper,12pt. TODO review? oneseide? onecol-umn,draft,openany`

1.3 Preprogrammed Formats

```
\title
\author
\year
\degree
\advisor
\coadvisor
\department
\departmenthead
abstract
```

The environment `abstract` must *precede* the `\makefrontmatter` command. Again, this is different from the standard L^AT_EX. Putting `abstract` after `\makefrontmatter` will trigger an error.

```
\begin{abstract}
Here goes the abstract...
\end{abstract}
```

`\makefrontmatter` The front matter of a thesis includes:

1. Title page (Required)
2. Copyright page
3. Submittal page (Required)
4. Abstract (Required)
5. Table of Contents (Required)
6. Lists (Required if included in thesis)
 - (a) List of Figures

- (b) List of Tables
- (c) List of Equations (optional)
- (d) List of Plates
- (e) List of Symbols

7. Acknowledgments

8. Dedication

Invoking

`\makefrontmatter`

will generate all components listed above. It can be commented out until you need the front matter generated.

`\chapter`
`\section`
`\subsection`
`\subsubsection`
`\paragraph`

===== Set-up
===== `\OnehalfSpacing`
`\OnehalfSpacing* \DoubleSpacing \DoubleSpacing*` Text will be double spaced
or 1.5 spaced. Sometimes it is also required to make page notes and floats (including captions) in ‘double’ spacing. The starred version of the two macros above takes care of this.

2 Implementation

```
1 \RequirePackage{ifthen}
```

The `\collect@body` macro in `amsmath` is defined using `\def`. We load `environ` to access the `\long` version of this command

```
2 \RequirePackage{environ}
```

The `review` boolean is defined here for use with the class options.

```
3 \newboolean{review}
```

2.1 Declaration of Options

```
4 \DeclareOption{draft}{\setboolean{review}{true}}
```

```
5 \DeclareOption{final}{\setboolean{review}{false}}
```

```
6 \PassOptionsToClass{final,12pt,onecolumn,openany}{memoir}}
```

```
7 \DeclareOption*
```

```
8 \PassOptionsToClass{\CurrentOption}{memoir}
```

```
9 }
```

```
10 \ExecuteOptions{final}
```

2.2 Execution of Options

```
11 \ProcessOptions\relax
```

2.3 Package Loading

```
12 \LoadClass[oneside,letterpaper]{memoir}
```

2.4 Main Code

Prevent LaTeX from hyphenating the entire document

```
\if@afterindent
```

LaTeX uses the switch `\if@afterindent` to decide whether to indent after a section heading. We just need to make sure that this is always true.

```
13 %
```

```
14 \< *class>
```

```
15 \let\@afterindentfalse\@afterindenttrue
```

```
16 \@afterindenttrue
```

```
17 \< /class>
```

```
18 %
```

2.4.1 Commands to define parameters for the front matter

```
19 \newboolean{auto} % for auto pyramid
```

```
20 \setboolean{auto}{false}
```

```
21 \def\year#1{\gdef\@year{#1}}
```

```
22 \newcommand{\degree}[2]{\gdef\@degreeelv{#1}\gdef\@degreename{#2}}
```

```
23 \def\advisor#1{\gdef\@advisor{#1}}
```

```
24 \def\coadvisor#1{\gdef\@coadvisor{#1}}
```

```
25 \def\department#1{\gdef\@department{#1}}
```

```
26 \def\departmenthead#1{\gdef\@departmenthead{#1}}
```

The following are the initial values for some macros that provide info.

```

27 \gdef\@author{Your Name}
28 \gdef\@title{This is the first line of a medium length title,
29 this is the second line}
30 \gdef\@year{2020}
31 \gdef\@degreeelv{Doctor of Philosophy}
32 \gdef\@degreeenname{Computer Science}
33 \gdef\@advisor{Dr. Main Advisor}
34 % ^^A \gdef\@coadvisor{Dr. Co Advisor}
35 \gdef\@department{Department of Some Name}
36 \gdef\@departmenthead{Dr. Department Head}

Set margins
37 % ^^A automatically set by the class option letterpaper
38 % ^^A \setstocksize{11in}{8.5in}
39 % ^^A set paper size equal to stock size
40 % ^^A \settrimmedsize{\stockheight}{\stockwidth}{*}
41 % ^^A set equal trim at the top and bottom
42 % ^^A \setlength{\trimtop}{\stockheight} % \trimtop = \stockheight
43 % ^^A \addtolength{\trimtop}{-\paperheight} % - \paperheight
44 % ^^A \setlength{\trimedge}{\stockwidth} % \trimedge = \stockwidth
45 % ^^A \addtolength{\trimedge}{-\paperwidth} % - \paperwidth
46 % ^^A \settrims{0.5\trimtop}{\trimedge}
47 \setpageecc{11in}{8.5in}{*}
48 % ^^A \settypeblocksize{\paperheight}{\paperwidth}{*}
49 \setlrmarginsandblock{1in}{*}{*}
50 \setulmarginsandblock{1in}{*}{*}
51 \setheadfoot{\onelineskip}{2\onelineskip}
52 \setheaderspaces{*}{2\onelineskip}{*}
53 \DoubleSpacing
54 \checkandfixthelayout
55

```

2.4.2 Front Matter

\makefrontmatter

```

56 \newcommand{\makefrontmatter}{
57 \pagenumbering{roman}
58 \pagestyle{empty}
59 \maketitlepage
60 \makecopyrightpage
61 \pagestyle{plain}
62 \setcounter{page}{2}
63 \makesubmittalpage
64 \makeabstractpage
65 \maketoc
66 \makeacknowledgementpage
67 \makededicationpage
68 \pagenumbering{arabic}
69 \setcounter{page}{1}
70 }

```

`\maketitlepage` The thesis title must be in all upper case letters, be centered on the page both horizontally and vertically, be in an inverted pyramid shape and the font size needs to be the same size as all other font in the main text (i.e. do not make the font size larger).

```

71 \DeclareRobustCommand{\invpyr}[1]{
72 \vbox{
73 \vspace{10pt}
74 \hsize=\textwidth
75     \parindent=\z@
76     \emergencystretch=1in
77     \parshape 6
78     0.01\textwidth .98\textwidth
79     0.1\textwidth .8\textwidth
80     0.15\textwidth .7\textwidth
81     0.2\textwidth .6\textwidth
82     0.25\textwidth .5\textwidth
83     0.3\textwidth .4\textwidth
84     \leftskip=\z@ plus 1fil
85     \rightskip=\z@ plus -1fil
86     \parfillskip=\z@ plus 2fil
87     #1\par
88 }
89 }
90 \newcommand{\autotitle}{\setboolean{auto}{true}}
91 \newcommand{\maketitlepage}{
92 \clearpage
93 \begin{vplace}
94 \centering
95 \ifthenelse{\boolean{auto}}{
96 {\invpyr{\MakeUppercase{\@title}}}
97 {\@title}
98 \end{vplace}
99 \begin{center}
100 by\\
101 \author
102 \end{center}
103 \clearpage
104 }

```

`\makecopyrightpage` Copyright Page. This is an optional page that follows the title page. No displayed page number, centered upper and lower case text.

```

105 \newcommand{\makecopyrightpage}{
106 \clearpage
107 \begin{vplace}[0.8]
108 \centering
109 Copyright~by~\author~\@year\\
110 All~Rights~Reserved
111 \end{vplace}
112 \clearpage

```

113 }

`\makesubmittalpage` Submittal Page. This is a required page that displays the Roman numeral ii page number. Beginning with this page, front matter Roman numeral page numbers are centered 1/2 inch from the bottom edge of page. All signatures are required before the final thesis format review.

```
114 \newcommand{\makesubmittalpage}{
115 \clearpage
116 A thesis submitted to the Faculty and the Board of
117 Trustees of the Colorado School of Mines in partial
118 fulfillment of the requirements for the degree of
119 {\@degreeelv} ({\@degreename}).
120
121 \vspace{2em}
122 \begin{flushleft}
123 Golden, Colorado\\[.5em]
124 Date \underline{\hspace{2in}}
125 \end{flushleft}
126
127 \vspace{.5em}
128 \begin{flushright}
129 Signed: \underline{\hspace{2in}}\\
130 {\@author}\\[2em]
131
132 Signed: \underline{\hspace{2in}}\\
133 \begin{SingleSpace}
134 {\@advisor}\\
135 Thesis Advisor\\[2em]
136 \end{SingleSpace}
137
138
139 \@ifundefined{@coadvisor}
140 {
141 \vspace{2.5em}
142 }
143 {
144 Signed: \underline{\hspace{2in}}\\
145 \begin{SingleSpace}
146 {\@coadvisor}\\
147 Thesis Advisor
148 \end{SingleSpace}
149 }
150
151 \end{flushright}
152
153 \begin{flushleft}
154 Golden, Colorado\\[.5em]
155 Date \underline{\hspace{2in}}
156 \end{flushleft}
```

```

157
158 \vspace{.5em}
159 \begin{flushright}
160 Signed: \underline{\hspace{2in}}\\
161
162 \begin{SingleSpace}
163 {\@departmenthead}\\
164 Professor and Head\\
165 {\@department}
166 \end{SingleSpace}
167
168 \end{flushright}
169
170 \clearpage
171 }

```

abstract We redefine the **abstract** environment. First, we need to save the text

```
172 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{}
```

\@saveabstract And saving the abstract

```

173 \newcommand{\@saveabstract}[1]{
174 \long\gdef\@abstract{#1}
175 }

```

\makeabstractpage ABSTRACT (title) is centered horizontally, 1 keyboard return below 1 inch top margin and in ALL UPPER CASE LETTERS. Each paragraph should be indented.

```

176 \newcommand{\makeabstractpage}{
177 \clearpage
178 \chapter*{Abstract}
179 \@abstract
180 \addcontentsline{toc}{chapter}{ABSTRACT}
181 \clearpage
182 }

```

acknowledgment We define the **acknowledgment** environment. First, we need to save the text

```
183 \newenvironment{acknowledgment}{\Collect@Body\@saveacknowledgments}{}
```

\@saveacknowledgments And saving the acknowledgments

```

184 \newcommand{\@saveacknowledgments}[1]{
185 \long\gdef\@acknowledgments{#1}
186 }

```

\makeacknowledgepage ACKNOWLEDGMENTS (Title) is centered horizontally, 1 keyboard return below 1 inch top margin and in ALL UPPER CASE LETTERS

```

187 \newcommand{\makeacknowledgepage}{
188 \@ifundefined{@acknowledgments}{}{
189 \clearpage

```



```

190 \chapter*{Acknowledgments}
191 \@acknowledgments
192 \addcontentsline{toc}{chapter}{ACKNOWLEDGMENTS}
193 \clearpage
194 }
195 }

```

dedication We define the `dedication` environment. First, we need to save the text

```

196 \newenvironment{dedication}{\Collect@Body\@savededication}{}

```

\@savededication And saving the dedication

```

197 \newcommand{\@savededication}[1]{
198 \long\gdef\@dedication{#1}
199 }

```

\makededicationpage ACKNOWLEDGMENTS (Title) is centered horizontally, 1 keyboard return below 1 inch top margin and in ALL UPPER CASE LETTERS. Dedication Page: A dedication page is optional and not frequently included in a thesis. However, occasionally the thesis writer wants to dedicate the document to a professional colleague, friend, or relative. A dedication typically expresses gratitude for someone's support. If a dedication page is included, it is placed at the end of the front matter section, following the acknowledgments. Typically, a dedication page has no title, it simply states, e.g., "For my father." Roman numeral page numbering continues on the dedication page.

```

200 \newcommand{\makededicationpage}{
201 \ifundefined{@dedication}{}{
202 \clearpage
203 \@dedication
204 \clearpage
205 }
206 }

```

We rename the headings for the toc, lof, and the references.

```

207 \renewcommand\contentsname{Table of Contents}
208 \renewcommand\listfigurename{List of Figures}
209 \renewcommand\listtablename{List of Tables}

```

\@dottedtocline@sec Redefine `\@dottedtocline` from the original `ltsect.dtx`

```

\@dottedtocline{<level>}{<indent>}{<numwidth>}{<title>}{<page>}
210 \newcommand{\@dottedtocline@sec}[5]{%
211 \ifnum #1>\c@tocdepth \else
212 \begin{SingleSpace}
213 \vskip \z@ \@plus.2\p@
214 {\leftskip #2\relax \rightskip \@tocrmarg \parfillskip -\rightskip
215 \parindent #2\relax\@afterindenttrue
216 \interlinepenalty\@M
217 \leavevmode
218 \@tempdima #3\relax

```

```

219 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
220 {#4}\nobreak
221 \leaders\hbox{$\m@th
222 \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
223 mu$}\hfill
224 \nobreak
225 \hb@xt@\@pnumwidth{\hfil\normalfont \normalcolor #5}%
226 \par}
227 \end{SingleSpace}%
228 \fi}

```

`\l@section` `\l@section{<title>}{<page>}` typesets the ToC entry for a `\section` heading.

```

229 \renewcommand{\@dotsep}{1}
230 \renewcommand{\l@section}{
231 \dottedtocline@sec{1}{1.5em}{2.3em}
232 }

```

`\l@chapapp` Redefine the generic chapter/appendix ToC entry typesetting.

```

233 \renewcommand{\l@chapapp}[3]{%
234 \ifnum \c@tocdepth >\m@ne
235 \begin{SingleSpace}
236 \cftchapterbreak
237 \vskip \cftbeforechapterskip
238 {
239 \leftskip \cftchapterindent\relax
240 %% \memRTLleftskip \cftchapterindent\relax
241 \rightskip \@tocrmarg
242 %% \memRTLrightskip \@tocrmarg
243 \parfillskip -\rightskip
244 %% \parfillskip -\memRTLrightskip
245 \parindent \cftchapterindent\relax
246 \@afterindenttrue
247 \interlinepenalty\@M
248 \leavevmode
249 \let\@cftbsnum \cftchapterpresnum
250 \let\@cftasnum \cftchapteraftersnum
251 \let\@cftasnumb \cftchapteraftersnumb
252 \def\@chapapp@head{#3}%
253 \settowidth{\@tempdima}{\cftchapterfont\@chapapp@head}%
254 \addtolength{\@tempdima}{\cftchapternumwidth}%
255 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
256 %% \advance\memRTLleftskip \@tempdima \null\nobreak\hskip -\memRTLleftskip
257 {\cftchapterfont {#1}}\nobreak
258 \cftchapterfillnum{#2}}
259 \end{SingleSpace}
260 \fi}
261
262 \renewcommand{\cftchapterdotsep}{\cftdotsep}
263 \renewcommand{\cftchapterfont}{\normalfont}

```

```

264 \renewcommand{\cftchapterpagefont}{\normalfont}
265 \renewcommand{\cftchapterleader}{\cftdotfill{\cftchapterdotsep}}
266 \renewcommand{\cftchaptername}{CHAPTER\space}
267 \renewcommand{\cftappendixname}{APPENDIX\space}
268 \renewcommand{\cftdotsep}{1}
269 % ^A no extra space before the entry, or in the LoF/LoT
270 \setlength{\cftbeforechapterskip}{\z@ plus \z@}
271 \renewcommand{\insertchapterspace}{}

\maketoc TABLE OF CONTENTS (Title) is centered horizontally, 1 keyboard return below
1 inch top margin and in ALL UPPER CASE LETTERS

272 \AtBeginDocument{
273 \ifpackageloaded{hyperref}{
274 \settocpreprocessor{chapter}{%
275 \let\tempf@rtoc\footmarkwidth
276 \def\footmarkwidth{%When hyperref is used,
277 \texorpdfstring{\MakeTextUppercase{\tempf@rtoc}}{\tempf@rtoc}}%
278 }
279 }{}
280 \setlength{\footmarkwidth}{\z@}
281 \setlength{\footmarksep}{-\footmarkwidth}
282 \setlength{\footparindent}{\footmarkwidth}
283 \renewcommand{\footnoterule}{%
284 \kern .5\baselineskip
285 \hrule width \columnwidth \kern .5\baselineskip}
286 }
287 \newcommand{\maketoc}{
288 \tableofcontents*
289 \clearpage
290 }

291 \makechapterstyle{mineschapter}{%
292 \setlength{\midchapskip}{.2\baselineskip}
293 \setlength{\afterchapskip}{.2\baselineskip}
294 \renewcommand{\chapnumfont}{\normalfont}
295 \renewcommand{\chapttitlefont}{\normalfont}
296 \renewcommand{\chapterheadstart}{}
297 \renewcommand{\printchapternum}{}
298 \renewcommand{\printchapternonum}{}
299 \renewcommand{\printchaptername}{%
300 \centerline{\chapnumfont\MakeUppercase{\@chapapp\ thechapter}}}
301 \renewcommand{\printchaptertitle}[1]{%
302 \centering \vbox{\chapttitlefont\invpyr{\MakeUppercase{##1}}}
303 }
304 }
305 \chapterstyle{mineschapter}
306 \newcommand{\reproduceinfo}[1]{
307 \begin{center}
308 #1\par
309 \end{center}

```

```

310 }
311 \newcommand{\reproduceabstract}{
312 {\noindent Abstract\par}
313 }
314 \newcommand{\symbolfootnote}[2]{
315 \renewcommand{\thefootnote}{\fnsymbol{footnote}}
316 \footnote[#1]{#2}
317 \renewcommand{\thefootnote}{\arabic{footnote}}
318 }

```

`\section` This section of code re-defines some standard stuff for sanity.

```

319 \renewcommand{\section}{\@startsection{section}
320 {1} % level
321 {\z@} % indent from left margin
322 {.1ex} % skip above heading
323 {.1ex} % heading between title and text
324 {\normalfont\normalsize\bfseries}}
325 \renewcommand{\subsection}{\@startsection{subsection}
326 {1} % level
327 {\z@} % indent from left margin
328 {.1ex} % skip above heading
329 {.1ex} % heading between title and text
330 {\normalfont\normalsize\bfseries}}
331 \renewcommand{\subsubsection}{\@startsection{subsubsection}
332 {1} % level
333 {\z@} % indent from left margin
334 {.1ex} % skip above heading
335 {.1ex} % heading between title and text
336 {\normalfont\normalsize\bfseries}}

```