

# The mines-thesis class \*

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## 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[10pt]{mines-thesis}
```

The default options are `letterpaper,12pt. TODO review? onside? 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<sup>A</sup>T<sub>E</sub>X. 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
pdflandscape
```

Try the `lscape` package: `lscape.sty` Produce landscape pages in a (mainly) portrait document. This modifies the margins and rotates the page contents but not the page number. Useful, for example, with large multipage tables, and is compatible with the packages `longtable` and `supertabular`. If you are using `pdfLaTeX`, you should use `pdfscape` instead. The `pdfscape` package adds PDF support to the landscape environment of package `lscape`, by setting the PDF/Rotate page attribute. Pages with this attribute will be displayed in landscape orientation by conforming PDF viewers:

```
begin{pdflandscape}
  Here goes the figure or table...
end{pdflandscape}
```

```
===== 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\@degree{#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\@degreeiname{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 \setpagecc{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 \setlength{\parindent}{2em}
55 \checkandfixthelayout
56

```

## 2.4.2 Front Matter

\makefrontmatter

```

57 \newcommand{\makefrontmatter}{
58 \pagenumbering{roman}
59 \pagestyle{empty}
60 \maketitlepage
61 \makecopyrightpage
62 \pagestyle{plain}
63 \setcounter{page}{2}
64 \makesubmittalpage
65 \makeabstractpage
66 \maketoc
67 \makeacknowledgementpage
68 \makededicationpage
69 \pagenumbering{arabic}
70 \setcounter{page}{1}
71 }

```

`\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).

```

72 \DeclareRobustCommand{\invpyr}[1]{
73 \vbox{
74 \vspace{10pt}
75 \hsize=\textwidth
76 \parindent=\z@
77 \emergencystretch=1in
78 \parshape 6
79 0.01\textwidth .98\textwidth
80 0.1\textwidth .8\textwidth
81 0.15\textwidth .7\textwidth
82 0.2\textwidth .6\textwidth
83 0.25\textwidth .5\textwidth
84 0.3\textwidth .4\textwidth
85 \leftskip=\z@ plus 1fil
86 \rightskip=\z@ plus -1fil
87 \parfillskip=\z@ plus 2fil
88 #1\par
89 }
90 }
91 \newcommand{\autotitle}{\setboolean{auto}{true}}
92 \newcommand{\maketitlepage}{
93 \clearpage
94 \begin{vplace}
95 \centering
96 \ifthenelse{\boolean{auto}}{
97 {\invpyr{\MakeTextUppercase{\@title}}}
98 {\@title}
99 \end{vplace}
100 \begin{center}
101 by\\
102 \@author
103 \end{center}
104 \clearpage
105 }

```

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

```

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

```

114 }

`\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.

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

```

158
159 \vspace{.5em}
160 \begin{flushright}
161 Signed: \underline{\hspace{2in}}\\
162
163 \begin{SingleSpace}
164 {\@departmenthead}\\
165 Professor and Head\\
166 {\@department}
167 \end{SingleSpace}
168
169 \end{flushright}
170
171 \clearpage
172 }

```

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

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

**\@saveabstract** And saving the abstract

```

174 \newcommand{\@saveabstract}[1]{
175 \long\gdef\@abstract{#1}
176 }

```

**\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.

```

177 \newcommand{\makeabstractpage}{
178 \clearpage
179 \chapter*{Abstract}
180 \@abstract
181 \addcontentsline{toc}{chapter}{\abstractname}
182 \clearpage
183 }

```

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

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

**\@saveacknowledgments** And saving the acknowledgments

```

185 \newcommand{\@saveacknowledgments}[1]{
186 \long\gdef\@acknowledgments{#1}
187 }

```

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

```

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

```



```

191 \chapter*{Acknowledgments}
192 \@acknowledgments
193 \addcontentsline{toc}{chapter}{ACKNOWLEDGMENTS}
194 \clearpage
195 }
196 }

dedication We define the dedication environment. First, we need to save the text
197 \newenvironment{dedication}{\Collect@Body\@savededication}{

\@savededication And saving the dedication
198 \newcommand{\@savededication}[1]{
199 \long\gdef\@dedication{#1}
200 }

\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.

201 \newcommand{\makededicationpage}{
202 \ifundefined{@dedication}{}{
203 \clearpage
204 \@dedication
205 \clearpage
206 }
207 }

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

208 \renewcommand{\abstractname}{ABSTRACT}
209 \renewcommand{\chaptername}{CHAPTER}
210 \renewcommand{\appendixname}{APPENDIX}
211 \renewcommand{\contentsname}{TABLE OF CONTENTS}
212 \renewcommand{\listfigurename}{LIST OF FIGURES}
213 \renewcommand{\listtablename}{LIST OF TABLES}
214 %% for REFERENCE section
215 \renewcommand{\bibname}{REFERENCES}

\@dottedtocline@sec Redefine \@dottedtocline from the original ltsect.dtx
\@dottedtocline{\level}{\indent}{\numwidth}{\title}{\page}
216 \newcommand{\@dottedtocline@sec}[5]{%
217 \ifnum #1>\c@tocdepth \else
218 \begin{SingleSpace}
219 \vskip \z@ \@plus.2\p@

```

```

220 {\leftskip #2\relax \rightskip \@tocrmarg \parfillskip -\rightskip
221 \parindent #2\relax\@afterindenttrue
222 \interlinepenalty\@M
223 \leavevmode
224 \@tempdima #3\relax
225 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
226 {#4}\nobreak
227 \leaders\hbox{$\m@th
228 \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
229 mu$}\hfill
230 \nobreak
231 \hb@xt@\@pnumwidth{\hfil\normalfont \normalcolor #5}%
232 \par}
233 \end{SingleSpace}%
234 \fi}

\l@section \l@section{<title>}{<page>} typesets the ToC entry for a \section heading.
235 \renewcommand{\@dotsep}{1}
236 \renewcommand{\l@section}{
237 \@dottedtocline@sec{1}{1.5em}{2.3em}
238 }

239 \renewcommand{\cftfigurename}{\figurename\space}
240 \renewcommand{\cfttablename}{\tablename\space}

\l@figure \l@figure{<title>}{<page>} typesets the LoF entry for a \figure caption heading.
Multiple line figure captions are single spaced.
241 \let\oldl@figure=\l@figure
242 \renewcommand{\l@figure}{\SingleSpacing
243 \oldl@figure }
244

\l@chapapp Redefine the generic chapter/appendix ToC entry typesetting.
245 \renewcommand{\l@chapapp}[3]{%
246 \ifnum \c@tocdepth >\m@ne
247 \begin{SingleSpace}
248 \cftchapterbreak
249 \vskip \cftbeforechapterskip
250 {
251 \leftskip \cftchapterindent\relax
252 %% \memRTLleftskip \cftchapterindent\relax
253 \rightskip \@tocrmarg
254 %% \memRTLrightskip \@tocrmarg
255 \parfillskip -\rightskip
256 %% \parfillskip -\memRTLrightskip
257 \parindent \cftchapterindent\relax
258 \@afterindenttrue
259 \interlinepenalty\@M
260 \leavevmode
261 \let\@cftbsnum \cftchapterpresnum

```

```

262 \let\@cftasnum \cftchapteraftersnum
263 \let\@cftasnumb \cftchapteraftersnumb
264 \def\@chapapp@head{#3}%
265 \settowidth{\@tempdima}{\cftchapterfont\@chapapp@head}%
266 \addtolength{\@tempdima}{\cftchapternumwidth}%
267 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
268 %%% \advance\memRTLleftskip \@tempdima \null\nobreak\hskip -\memRTLleftskip
269 {\cftchapterfont {#1}}\nobreak
270 \cftchapterfillnum{#2}}
271 \end{SingleSpace}
272 \fi}

273 \renewcommand{\cftchapterdotsep}{\cftdotsep}
274 \renewcommand{\cftchapterfont}{\normalfont\MakeTextUppercase}
275 \renewcommand{\cftchapterpagefont}{\normalfont}
276 \renewcommand{\cftchapterleader}{\cftdotfill{\cftchapterdotsep}}
277 \renewcommand{\cftchaptername}{\chaptername\space}
278 \renewcommand{\cftappendixname}{\appendixname\space}
279 \renewcommand{\cftdotsep}{1}
280 % ^^A no extra space before the entry, or in the LoF/LoT
281 \setlength{\cftbeforechapterskip}{\z@ plus \z@}
282 \renewcommand{\insertchapterspace}{
283 \addtocontents{lof}{\protect\addvspace{5pt}} % previous default 10pt
284 \addtocontents{lot}{\protect\addvspace{5pt}}
285 }

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

286 \AtBeginDocument{
287 \ifpackageloaded{hyperref}{
288 \settocpreprocessor{chapter}{%
289 \let\tempf@rtoc\f@rtoc%
290 \def\f@rtoc{%When hyperref is used,
291 \texorpdfstring{\MakeTextUppercase{\tempf@rtoc}}{\tempf@rtoc}}%
292 }
293 \renewcommand{\cftchapterfont}{\normalfont}
294 }{}
295 }
296 \newcommand{\maketoc}{
297 \tableofcontents*
298 \clearpage
299 \listoffigures
300 \clearpage
301 \listoftables
302 \clearpage
303 }

```

### 2.4.3 Main Body

\chapter

```

304 \makechapterstyle{mineschapter}{%
305 \setlength{\midchapskip}{.2\baselineskip}
306 \setlength{\afterchapskip}{.2\baselineskip}
307 \renewcommand{\chapnumfont}{\normalfont}
308 \renewcommand{\chapttitlefont}{\normalfont}
309 \renewcommand{\chapterheadstart}{}
310 \renewcommand{\printchapternum}{}
311 \renewcommand{\printchapternonum}{}
312 \renewcommand{\printchaptername}{%
313 \centerline{\chapnumfont\MakeTextUppercase{\@chapapp\ \thechapter}}}
314 \renewcommand{\printchaptertitle}[1]{%
315 \centering \vbox{\chapttitlefont\invpyr{\MakeTextUppercase{##1}}}}
316 }
317 }
318 \chapterstyle{mineschapter}

\reproduceinfo Information about the reproduced chapter. Including the author, year,
organization, publisher.
319 \newcommand{\reproduceinfo}[1]{
320 \begin{center}
321 #1\par
322 \end{center}
323 }

\reproduceabstract One single line of Abstract flused left.
324 \newcommand{\reproduceabstract}{
325 {\noindent Abstract\par}
326 }

\footnote Set the format for \footnote. One horizontal line to separate the text and the
footnotes.
327 \AtBeginDocument{
328 \setlength{\footmarkwidth}{\z@}
329 \setlength{\footmarksep}{-\footmarkwidth}
330 \setlength{\footparindent}{\footmarkwidth}
331 \renewcommand{\footnoterule}{%
332 \kern .5\baselineskip%
333 \hrule width \columnwidth \kern .5\baselineskip}
334 }

\symbolfootnote A new type of footnote command which use symbols instead of arabic numbers as
markers
335 \newcommand{\symbolfootnote}[2]{
336 \renewcommand{\thefootnote}{\fnsymbol{footnote}}
337 \footnote[#1]{#2}
338 \renewcommand{\thefootnote}{\arabic{footnote}}
339 }

\section Redefine \section, \subsection and \subsubsection.

```

```

340 \renewcommand{\section}{\@startsection{section}
341 {1} % level
342 {\z@} % indent from left margin
343 {.1ex} % skip above heading
344 {.1ex} % heading between title and text
345 {\normalfont\normalsize\bfseries}}
346 \renewcommand{\subsection}{\@startsection{subsection}
347 {1} % level
348 {\z@} % indent from left margin
349 {.1ex} % skip above heading
350 {.1ex} % heading between title and text
351 {\normalfont\normalsize\bfseries}}
352 \renewcommand{\subsubsection}{\@startsection{subsubsection}
353 {1} % level
354 {\z@} % indent from left margin
355 {.1ex} % skip above heading
356 {.1ex} % heading between title and text
357 {\normalfont\normalsize\bfseries}}

```

#### 2.4.4 Back Matter

#### 2.4.5 Others

Change the indent of References if natbib packadge is loaded.

```

358 \AtBeginDocument{
359 \@ifpackageloaded{natbib}{
360 \setlength{\bibhang}{\parindent}
361 \renewcommand{\bibpreamble}{\vspace{\baselineskip}}
362 }{}
363 }

```

**pdflandscape** We define the pdflandscape to handle the page numbering in landscape mode.

```

364 \AtBeginDocument{
365 \@ifpackageloaded{pdflscape}{
366 \newcommand{\Lpagenumber}{\ifdim\textwidth=\linewidth\else\bgroup
367 \dimendef\margin=0 %use \margin instead of \dimen0
368 \ifodd\value{page}\margin=\oddsidemargin
369 \else\margin=\evensidemargin
370 \fi
371 \raisebox{\dimexpr -\topmargin-\headheight-\headsep-0.5\linewidth}{[0pt][0pt]{%
372 \rlap{\hspace{\dimexpr \margin+\textheight+\footskip}}%
373 \llap{\rotatebox{90}{\thepage}}}}}%
374 \egroup\fi
375 }
376 \@ifpackageloaded{everypage}{
377 \AddEverypageHook{\Lpagenumber}%
378 \newenvironment{pdflandscape}{
379 \begin{landscape}\pagestyle{empty}}{
380 \end{landscape}
381 \pagestyle{plain}}

```

382 }{}  
383 }{}  
384 }