# 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.

# Contents

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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[`⟨*options*⟩`]{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? oneside? onecolumn,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 LATEX. 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 commentted 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 `pdflscape` instead. The pdflscape 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\@degreelv{#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\@degreelv{Doctor of Philosophy}
32 \gdef\@degreename{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 \makecft
67 \makeacknowledgepage
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 }
```

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 {\@degreelv} ({\@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 redifine 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 difine 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 difine 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 }
```

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

```
208 \renewcommand{\l@chapapp}[3]{%
209 \ifnum \c@tocdepth >\m@ne
210 \begin{SingleSpace}
211 \cftchapterbreak
212 \vskip \cftbeforechapterskip
213 {
214 \leftskip \cftchapterindent\relax
215 %%%     \memRTLleftskip \cftchapterindent\relax
216 \rightskip \@tocrmarg
217 %%%     \memRTLrightskip \@tocrmarg
218 \parfillskip -\rightskip
219 %%%     \parfillskip -\memRTLrightskip
220 \parindent \cftchapterindent\relax
221 \@afterindenttrue
222 \interlinepenalty\@M
```

```
223 \leavevmode
224 \let\@cftbsnum \cftchapterpresnum
225 \let\@cftasnum \cftchapteraftersnum
226 \let\@cftasnumb \cftchapteraftersnumb
227 \def\@chapapp@head{#3}%
228 \settowidth{\@tempdima}{\cftchapterfont\@chapapp@head}%
229 \addtolength{\@tempdima}{\cftchapternumwidth}%
230 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
231 %%%    \advance\memRTLleftskip \@tempdima \null\nobreak\hskip -\memRTLleftskip
232 {\cftchapterfont {#1}}\nobreak
233 \cftchapterfillnum{#2}}
234 \end{SingleSpace}
235 \fi}

236 \renewcommand{\cftchapterdotsep}{\cftdotsep}
237 \renewcommand{\cftchapterfont}{\normalfont\MakeTextUppercase}
238 \renewcommand{\cftchapterpagefont}{\normalfont}
239 \renewcommand{\cftchapterleader}{\cftdotfill{\cftchapterdotsep}}
240 \renewcommand{\cftchaptername}{\chaptername\space}
241 \renewcommand{\cftappendixname}{\appendixname\space}
242 \renewcommand{\cftdotsep}{1}
243 % ^^A no extra space before the entry, or in the LoF/LoT
244 \setlength{\cftbeforechapterskip}{\z@ plus \z@}
245 \renewcommand{\insertchapterspace}{
246 \addtocontents{lof}{\protect\addvspace{5pt}} % previous default 10pt
247   \addtocontents{lot}{\protect\addvspace{5pt}}
248 }
```

\makecft   \makecft generates Table of Contents, List of Figures, and List of Tables. TABLE
OF CONTENTS (Title) is centered horizontally, 1 keyboard return below 1 inch
top margin and in ALL UPPER CASE LETTERS

```
249 \AtBeginDocument{
250 \@ifpackageloaded{hyperref}{
251 \settocpreprocessor{chapter}{%
252 \let\tempf@rtoc\f@rtoc%
253 \def\f@rtoc{%When hyperref is used,
254 \texorpdfstring{\MakeTextUppercase{\tempf@rtoc}}{\tempf@rtoc}}%
255 }
256 \renewcommand{\cftchapterfont}{\normalfont}
257 }{}
258 }
259 \newcommand{\makecft}{
260 \tableofcontents*
261 \clearpage
262 \listoffigures
263 \clearpage
264 \listoftables
265 \clearpage
266 } % end \makecft
```

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

```
267 \renewcommand{\abstractname}{ABSTRACT}
268 \renewcommand{\chaptername}{CHAPTER}
269 \renewcommand{\appendixname}{APPENDIX}
270 \renewcommand{\contentsname}{TABLE OF CONTENTS}
271 \renewcommand{\listfigurename}{LIST OF FIGURES}
272 \renewcommand{\listtablename}{LIST OF TABLES}
273 %% for REFERENCE section
274 \renewcommand{\bibname}{REFERENCES}
```

\@dottedtocline@sec  Redefine \@dottedtocline from the original ltsect.dtx
\@dottedtocline{⟨level⟩}{⟨indent⟩}{⟨numwidth⟩}{⟨title⟩}{⟨page⟩}

```
275 \newcommand{\@dottedtocline@sec}[5]{%
276 \ifnum #1>\c@tocdepth \else
277 \begin{SingleSpace}
278 \vskip \z@ \@plus.2\p@
279 {\leftskip #2\relax \rightskip \@tocrmarg \parfillskip -\rightskip
280 \parindent #2\relax\@afterindenttrue
281 \interlinepenalty\@M
282 \leavevmode
283 \@tempdima #3\relax
284 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
285 {#4}\nobreak
286 \leaders\hbox{$\m@th
287 \mkern \@dotsep mu\hbox{.}\mkern \@dotsep
288 mu$}\hfill
289 \nobreak
290 \hb@xt@\@pnumwidth{\hfil\normalfont \normalcolor #5}%
291 \par}
292 \end{SingleSpace}%
293 \fi}
```

\l@section  \l@section{⟨title⟩}{⟨page⟩} typesets the ToC entry for a \section heading.

```
294 \renewcommand{\@dotsep}{1}
295 \renewcommand{\l@section}{
296 \@dottedtocline@sec{1}{1.5em}{2.3em}
297 }

298 \renewcommand{\cftfigurename}{\figurename\space}
299 \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.

```
300 \let\oldl@figure=\l@figure
301 \renewcommand{\l@figure}{\SingleSpacing\oldl@figure}
```

\l@table  \l@table{⟨title⟩}{⟨page⟩} typesets the LoF entry for a \table caption heading.
Multiple line table captions are single spaced.

```
302 \let\oldl@table=\l@table
303 \renewcommand{\l@table}{\SingleSpacing\oldl@table}
```

### 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{\chaptitlefont}{\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{\chaptitlefont\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 }
```