

# The mines-thesis class \*

Ming Li<sup>†</sup> Jian Lin

January 11, 2020

## Abstract

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

## Contents

<b>1</b>	<b>User's guide</b>	<b>2</b>
1.1	Installation . . . . .	2
1.2	Invocation and options . . . . .	2
1.3	Preprogrammed Formats . . . . .	2
<b>2</b>	<b>Frequently Asked Questions</b>	<b>4</b>
<b>3</b>	<b>Implementation</b>	<b>4</b>
3.1	Declaration of Options . . . . .	4
3.2	Execution of Options . . . . .	4
3.3	Package Loading . . . . .	4
3.4	Main Code . . . . .	4
3.4.1	Commands to define parameters for the front matter . . . .	5
3.4.2	Front Matter . . . . .	5
3.4.3	Main Body . . . . .	12
3.4.4	Back Matter . . . . .	13
3.4.5	Others . . . . .	13

---

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

<sup>†</sup>mili@mymail.mines.edu

# 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`  
`landscape`

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{landscape}
  Here goes the figure or table...
end{landscape}
```

===== 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 Frequently Asked Questions

Blank pages. If you use `landscape` and got extra blank pages, it is mostly because your figure is too large. You need to resize the height or width of the figure. For example, instead of `\includegraphics[width=\linewidth]{FigureName}`, you should use `\includegraphics[width=.6\linewidth]{FigureName}`

## 3 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}
```

### 3.1 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}
```

### 3.2 Execution of Options

```
11 \ProcessOptions\relax
```

### 3.3 Package Loading

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

### 3.4 Main Code

Prevent LaTeX from hyphenating the entire document

`\if@afterindent` L<sup>A</sup>T<sub>E</sub>X 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 %
```

### 3.4.1 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

```

### 3.4.2 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 \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 }

\makeacknowledgementpage ACKNOWLEDGMENTS (Title) is centered horizontally, 1 keyboard return below
1 inch top margin and in ALL UPPER CASE LETTERS
188 \newcommand{\makeacknowledgementpage}{
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 }

\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}
```

### 3.4.3 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}}

```

`longtable`

```

358 \AtBeginDocument{
359 \@ifpackageloaded{longtable}{
360 \setlength{\LTcapwidth}{\linewidth}
361
362 }{}
363 }

```

#### 3.4.4 Back Matter

#### 3.4.5 Others

Change the indent of References if `natbib` packadge is loaded.

```

364 \AtBeginDocument{
365 \@ifpackageloaded{natbib}{
366 \setlength{\bibhang}{\parindent}

```

```

367 \renewcommand{\bibpreamble}{\vspace{\baselineskip}}
368 }{}
369 }

```

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

```

370 \AtBeginDocument{
371 \ifpackageloaded{pdflscape}{
372 \newcommand{\Lpagenumber}{\ifdim\textwidth=\linewidth\else\bgroup
373 \dimendef\margin=0 %use \margin instead of \dimen0
374 \ifodd\value{page}\margin=\oddsidemargin
375 \else\margin=\evensidemargin
376 \fi
377 \raisebox{\dimexpr -\topmargin-\headheight-\headsep-0.5\linewidth}[0pt][0pt]{%
378 \rlap{\hspace{\dimexpr \margin+\textheight+\footskip}}%
379 \llap{\rotatebox{90}{\thepage}}}%
380 \egroup\fi
381 }
382 \@ifpackageloaded{everypage}{
383 \AddEveryPageHook{\Lpagenumber}%
384 \let\oldlandscape=\landscape
385 \let\endoldlandscape=\endlandscape
386 \renewenvironment{landscape}{
387 \oldlandscape\pagestyle{empty}\begin{vplace}}{
388 \end{vplace}\endoldlandscape
389 \pagestyle{plain}}
390 }{}
391 }{}
392 }

```