# The mines-thesis class [*]

Ming Li[†]  Jian Lin

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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.

[†]`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[`⟨*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
```

========================================= 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 \maketoc
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{\MakeUppercase{\@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 {\@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 }
```

We rename the headings for the toc, lof, 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    Redifine `\@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{\l@figure}{
240 \@dottedtocline@sec{1}{1.5em}{2.3em}
241 }
242 \renewcommand{\l@table}{
243 \@dottedtocline@sec{1}{1.5em}{2.3em}
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
274 \renewcommand{\cftchapterdotsep}{\cftdotsep}
275 \renewcommand{\cftchapterfont}{\normalfont\MakeUppercase}
276 \renewcommand{\cftchapterpagefont}{\normalfont}
277 \renewcommand{\cftchapterleader}{\cftdotfill{\cftchapterdotsep}}
278 \renewcommand{\cftchaptername}{\chaptername\space}
279 \renewcommand{\cftappendixname}{\appendixname\space}
280 \renewcommand{\cftdotsep}{1}
281 % ^^A no extra space before the entry, or in the LoF/LoT
282 \setlength{\cftbeforechapterskip}{\z@ plus \z@}
283 \renewcommand{\insertchapterspace}{}
```

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

```
284 \AtBeginDocument{
285 \@ifpackageloaded{hyperref}{
286 \settocpreprocessor{chapter}{%
287 \let\tempf@rtoc\f@rtoc%
288 \def\f@rtoc{%When hyperref is used,
289 \texorpdfstring{\MakeTextUppercase{\tempf@rtoc}}{\tempf@rtoc}}%
290 }
291 \renewcommand{\cftchapterfont}{\normalfont}
292 }{}
293 \setlength{\footmarkwidth}{\z@}
294 \setlength{\footmarksep}{-\footmarkwidth}
295 \setlength{\footparindent}{\footmarkwidth}
296 \renewcommand{\footnoterule}{%
297 \kern .5\baselineskip%
298 \hrule width \columnwidth \kern .5\baselineskip}
299 }
300 \newcommand{\maketoc}{
301 \tableofcontents*
302 \clearpage
303 \listoffigures
304 \clearpage
305 \listoftables
306 \clearpage
307 }
```

### 2.4.3  Main Body

**\chapter**

```
308 \makechapterstyle{mineschapter}{%
309 \setlength{\midchapskip}{.2\baselineskip}
310 \setlength{\afterchapskip}{.2\baselineskip}
311 \renewcommand{\chapnumfont}{\normalfont}
312 \renewcommand{\chaptitlefont}{\normalfont}
313 \renewcommand{\chapterheadstart}{}
314 \renewcommand{\printchapternum}{}
315 \renewcommand{\printchapternonum}{}
316 \renewcommand{\printchaptername}{%
317 \centerline{\chapnumfont\MakeUppercase{\@chapapp\ \thechapter}}}
318 \renewcommand{\printchaptertitle}[1]{%
319 \centering \vbox{\chaptitlefont\invpyr{\MakeUppercase{##1}}}
320 }
321 }
322 \chapterstyle{mineschapter}
323 \newcommand{\reproduceinfo}[1]{
324 \begin{center}
325 #1\par
326 \end{center}
327 }
328 \newcommand{\reproduceabstract}{
329 {\noindent Abstract\par}
330 }
331 \newcommand{\symbolfootnote}[2]{
332 \renewcommand{\thefootnote}{\fnsymbol{footnote}}
333 \footnote[#1]{#2}
334 \renewcommand{\thefootnote}{\arabic{footnote}}
335 }
```

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

```
336 \renewcommand{\section}{\@startsection{section}
337 {1} % level
338 {\z@} % indent from left margin
339 {.1ex} % skip above heading
340 {.1ex} % heading between title and text
341 {\normalfont\normalsize\bfseries}}
342 \renewcommand{\subsection}{\@startsection{subsection}
343 {1} % level
344 {\z@} % indent from left margin
345 {.1ex} % skip above heading
346 {.1ex} % heading between title and text
347 {\normalfont\normalsize\bfseries}}
348 \renewcommand{\subsubsection}{\@startsection{subsubsection}
349 {1} % level
350 {\z@} % indent from left margin
351 {.1ex} % skip above heading
352 {.1ex} % heading between title and text
353 {\normalfont\normalsize\bfseries}}
```

### 2.4.4 Back Matter

### 2.4.5 Others

```
354 \AtBeginDocument{
355 \setlength{\bibhang}{\parindent}
356 \renewcommand{\bibpreamble}{\vspace{\baselineskip}}
357
358 \newcommand{\Lpagenumber}{\ifdim\textwidth=\linewidth\else\bgroup
359 \dimendef\margin=0 %use \margin instead of \dimen0
360 \ifodd\value{page}\margin=\oddsidemargin
361 \else\margin=\evensidemargin
362 \fi
363 \raisebox{\dimexpr -\topmargin-\headheight-\headsep-0.5\linewidth}[0pt][0pt]{%
364 \rlap{\hspace{\dimexpr \margin+\textheight+\footskip}%
365 \llap{\rotatebox{90}{\thepage}}}}%
366 \egroup\fi}
367 \AddEverypageHook{\Lpagenumber}%
368 }
369
```