

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^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
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

3.1 Initial Code

These packages are useful when writing this `.dtx` file. The `\ifthenelse` macro controls many conditional logic commands. The `\collect@body` macro in `amsmath` is defined using `\def`. We load `environ` to access the `\long` version of this command.

```
1 \RequirePackage{ifthen}
2 \RequirePackage{environ}
```

3.1.1 Declaration of Options

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

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

3.1.2 Execution of Options

```
11 \ProcessOptions\relax
```

3.1.3 Package Loading

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

3.2 Main Code

3.2.1 Front Matter

```
13 \newboolean{auto} % for auto pyramid
14 \setboolean{auto}{false}

15 \def\year#1{\gdef\@year{#1}}
16 \newcommand{\degree}[2]{\gdef\@degreelv{#1}\gdef\@degreename{#2}}
17 \def\advisor#1{\gdef\@advisor{#1}}
18 \def\coadvisor#1{\gdef\@coadvisor{#1}}
```

```

19 \def\department#1{\gdef\@department{#1}}
20 \def\departmenthead#1{\gdef\@departmenthead{#1}}

```

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

```

21 \gdef\@author{Your Name}
22 \gdef\@title{This is the first line of a medium length title,
23 this is the second line}
24 \gdef\@year{2020}
25 \gdef\@degreeelv{Doctor of Philosophy}
26 \gdef\@degreeiname{Computer Science}
27 \gdef\@advisor{Dr. Main Advisor}
28 % ^^A \gdef\@coadvisor{Dr. Co Advisor}
29 \gdef\@department{Department of Some Name}
30 \gdef\@departmenthead{Dr. Department Head}

```

Set margins

```

31 % ^^A automatically set by the class option letterpaper
32 % ^^A \setstocksize{11in}{8.5in}
33 % ^^A set paper size equal to stock size
34 % ^^A \settrimmedsize{\stockheight}{\stockwidth}{*}
35 % ^^A set equal trim at the top and bottom
36 % ^^A \setlength{\trimtop}{\stockheight} % \trimtop = \stockheight
37 % ^^A \addtolength{\trimtop}{-\paperheight} % - \paperheight
38 % ^^A \setlength{\trimedge}{\stockwidth} % \trimedge = \stockwidth
39 % ^^A \addtolength{\trimedge}{-\paperwidth} % - \paperwidth
40 % ^^A \settrims{0.5\trimtop}{\trimedge}
41 \setpagecc{11in}{8.5in}{*}
42 % ^^A \settypeblocksize{\paperheight}{\paperwidth}{*}
43 \setlrmarginsandblock{1in}{*}{*}
44 \setulmarginsandblock{1in}{*}{*}
45 \setheadfoot{\onelineskip}{2\onelineskip}
46 \setheaderspaces{*}{2\onelineskip}{*}
47 \DoubleSpacing
48 \setlength{\parindent}{2em}
49 \checkandfixthelayout
50

```

3.2.2 Front Matter

\makefrontmatter

```

51 \newcommand{\makefrontmatter}{
52 \pagenumbering{roman}
53 \pagestyle{empty}
54 \maketitlepage
55 \makecopyrightpage
56 \pagestyle{plain}
57 \setcounter{page}{2}
58 \makesubmittalpage
59 \makeabstractpage
60 \makecft
61 \makeacknowledgementpage

```

```

62 \makededicationpage
63 \pagenumbering{arabic}
64 \setcounter{page}{1}
65 }

```

`\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).

```

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

```

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

```

100 \newcommand{\makecopyrightpage}{
101 \clearpage
102 \begin{vplace}[0.8]

```

```

103 \centering
104 Copyright~by~\@author~\@year\\
105 All~Rights~Reserved
106 \end{vplace}
107 \clearpage
108 }

```

`\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.

```

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

```

```

147
148 \begin{flushleft}
149 Golden, Colorado\\[.5em]
150 Date \underline{\hspace{2in}}
151 \end{flushleft}
152
153 \vspace{.5em}
154 \begin{flushright}
155 Signed: \underline{\hspace{2in}}\\
156
157 \begin{SingleSpace}
158 {\@departmenthead}\\
159 Professor and Head\\
160 {\@department}
161 \end{SingleSpace}
162
163 \end{flushright}
164
165 \clearpage
166 }

abstract We redefine the abstract environment. First, we need to save the text
167 \renewenvironment{abstract}{\Collect@Body\@saveabstract}{\}

\@saveabstract And saving the abstract
168 \newcommand{\@saveabstract}[1]{
169 \long\gdef\@abstract{#1}
170 }

\makeabstractpage ABSTRACT (title) is centered horizontally, 1 keyboard return below 1 inch top
margin and in ALL UPPER CASE LETTERS. Each paragraph should be in-
dented.
171 \newcommand{\makeabstractpage}{
172 \clearpage
173 \chapter*{Abstract}
174 \@abstract
175 \addcontentsline{toc}{chapter}{\abstractname}
176 \clearpage
177 }

acknowledgment We define the acknowledgment environment. First, we need to save the text
178 \newenvironment{acknowledgment}{\Collect@Body\@saveacknowledgments}{\}

\@saveacknowledgments And saving the acknowledgments
179 \newcommand{\@saveacknowledgments}[1]{
180 \long\gdef\@acknowledgments{#1}
181 }

```


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

```

182 \newcommand{\makeacknowledgementpage}{
183 \@ifundefined{@acknowledgments}{}{
184 \clearpage
185 \chapter*{Acknowledgments}
186 \@acknowledgments
187 \addcontentsline{toc}{chapter}{ACKNOWLEDGMENTS}
188 \clearpage
189 }
190 }

```

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

```

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

```

`\@savededication` And saving the dedication

```

192 \newcommand{\@savededication}[1]{
193 \long\gdef\@dedication{#1}
194 }

```

`\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.

```

195 \newcommand{\makededicationpage}{
196 \@ifundefined{@dedication}{}{
197 \clearpage
198 \@dedication
199 \clearpage
200 }
201 }

```

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

```

202 \renewcommand{\l@chapapp}[3]{%
203 \ifnum \c@tocdepth >\m@ne
204 \begin{SingleSpace}
205 \cftchapterbreak
206 \vskip \cftbeforechapterskip
207 {
208 \leftskip \cftchapterindent\relax
209 %%% \memRTLleftskip \cftchapterindent\relax
210 \rightskip \@tocrmarg
211 %%% \memRTLrightskip \@tocrmarg

```

```

212 \parfillskip -\rightskip
213 %% \parfillskip -\memRTLrightskip
214 \parindent \cftchapterindent\relax
215 \@afterindenttrue
216 \interlinepenalty\@M
217 \leavevmode
218 \let\@cftbsnum \cftchapterpresnum
219 \let\@cftasnum \cftchapteraftersnum
220 \let\@cftasnumb \cftchapteraftersnumb
221 \def\@chapapp@head{#3}%
222 \settowidth{\@tempdima}{\cftchapterfont\@chapapp@head}%
223 \addtolength{\@tempdima}{\cftchapternumwidth}%
224 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
225 %% \advance\memRTLleftskip \@tempdima \null\nobreak\hskip -\memRTLleftskip
226 {\cftchapterfont {#1}}\nobreak
227 \cftchapterfillnum{#2}}
228 \end{SingleSpace}
229 \fi}

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

```

`\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

```

244 \AtBeginDocument{
245 \@ifpackageloaded{hyperref}{
246 \settocpreprocessor{chapter}{%
247 \let\tempf@rtoc=f@rtoc%
248 \def\f@rtoc{%When hyperref is used,
249 \texorpdfstring{\MakeTextUppercase{\tempf@rtoc}}{\tempf@rtoc}}%
250 }
251 \renewcommand{\cftchapterfont}{\normalfont}
252 }{}
253 }
254 \newcommand{\makecft}{
255 \tableofcontents*
256 \clearpage

```

```

257 \listoffigures
258 \clearpage
259 \listoftables
260 \clearpage
261 } % end \makecft

```

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

```

262 \renewcommand{\abstractname}{ABSTRACT}
263 \renewcommand{\chaptername}{CHAPTER}
264 \renewcommand{\appendixname}{APPENDIX}
265 \renewcommand{\contentsname}{TABLE OF CONTENTS}
266 \renewcommand{\listfigurename}{LIST OF FIGURES}
267 \renewcommand{\listtablename}{LIST OF TABLES}
268 %% for REFERENCE section
269 \renewcommand{\bibname}{REFERENCES}

```

`\@dottedtocline@sec` Redefine `\@dottedtocline` from the original `ltsect.dtx` `\@dottedtocline{<level>}{<indent>}{<numwidth>}`

```

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

```

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

```

289 \renewcommand{\@dotsep}{1}
290 \renewcommand{\l@section}{
291 \@dottedtocline@sec{1}{1.5em}{2.3em}
292 }

```

```

293 \renewcommand{\cftfigurename}{\figurename\space}
294 \renewcommand{\cfttablename}{\tablename\space}
295 \setlength{\cftparskip}{-\parskip}

```

`\l@figure` `\l@figure{<title>}{<page>}` typesets the LoF entry for a `\figure` caption heading. Multiple line figure captions are single spaced.

```

296 \let\oldl@figure=\l@figure
297 \renewcommand{\l@figure}{\SingleSpacing\oldl@figure}

\l@table \l@table{\langle title\rangle}{\langle page\rangle} typesets the LoF entry for a \table caption heading.
Multiple line table captions are single spaced.
298 \let\oldl@table=\l@table
299 \renewcommand{\l@table}{\SingleSpacing\oldl@table}

```

3.2.3 Main Body

`\chapter`

```

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

```

`\reproduceinfo` Information about the reproduced chapter. Including the author, year, organization, publisher.

```

315 \newcommand{\reproduceinfo}[1]{
316 \begin{center}
317 #1\par
318 \end{center}
319 }

```

`\reproduceabstract` One single line of Abstract flused left.

```

320 \newcommand{\reproduceabstract}{
321 {\noindent Abstract\par}
322 }

```

`\footnote` Set the format for \footnote. One horizontal line to separate the text and the footnotes.

```

323 \AtBeginDocument{
324 \setlength{\footmarkwidth}{\z@}
325 \setlength{\footmarksep}{-\footmarkwidth}
326 \setlength{\footparindent}{\footmarkwidth}
327 \renewcommand{\footnoterule}{%
328 \kern .5\baselineskip%
329 \hrule width \columnwidth \kern .5\baselineskip}
330 }

```

`\symbolfootnote` A new type of footnote command which use symbols instead of arabic numbers as markers

```
331 \newcommand{\symbolfootnote}[2]{
332 \renewcommand{\thefootnote}{\fnsymbol{footnote}}
333 \footnote[#1]{#2}
334 \renewcommand{\thefootnote}{\arabic{footnote}}
335 }
```

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

```
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}}
```

`longtable`

```
354 \AtBeginDocument{
355 \@ifpackageloaded{longtable}{
356 \setlength{\LTcapwidth}{\linewidth}
357
358 }{}
359 }
```

3.2.4 Back Matter

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

```
360 \AtBeginDocument{
361 \@ifpackageloaded{natbib}{
362 \setlength{\bibhang}{\parindent}
363 \renewcommand{\bibpreamble}{\vspace{\parskip}}
364 }{}
365 }
```

`\bibliography`

```
366 \let\oldbibliography=\bibliography
367 \renewcommand{\bibliography}{\SingleSpacing\oldbibliography}
```

3.2.5 Others

`\firmlist` These two macros can be used at the start of a list environment to reduce the vertical gaps. `\tightlist` removes all interior spaces while `\firmlist` only removes some.

```

368 \AtBeginDocument{
369 \firmlists
370 } %\tightlists

```

Prevent LaTeX from hyphenating the entire document

```

371 \AtBeginDocument{
372 \tolerance=1
373 \emergencystretch=\maxdimen
374 \hyphenpenalty=10000
375 \hbadness=10000
376 }

```

`\if@afterindent` L^AT_EX 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.

```

377 \AtBeginDocument{
378 \let\@afterindentfalse\@afterindenttrue
379 \@afterindenttrue
380 }
381 %
382 %

```

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

```

383 \AtBeginDocument{
384 \@ifpackageloaded{pdflscape}{
385 \newcommand{\Lpagenumber}{\ifdim\textwidth=\linewidth\else\bgroup
386 \dimendef\margin=0 %use \margin instead of \dimen0
387 \ifodd\value{page}\margin=\oddsidemargin
388 \else\margin=\evensidemargin
389 \fi
390 \raisebox{\dimexpr -\topmargin-\headheight-\headsep-0.5\linewidth}{[0pt] [0pt] {%
391 \rlap{\hspace{\dimexpr \margin+\textheight+\footskip}%
392 \llap{\rotatebox{90}{\thepage}}}}}%
393 \egroup\fi
394 }
395 \@ifpackageloaded{everypage}{
396 \AddEveryPageHook{\Lpagenumber}%
397 \let\oldlandscape=\landscape
398 \let\endoldlandscape=\endlandscape
399 \renewenvironment{landscape}{
400 \oldlandscape\pagestyle{empty}\begin{vplace}}{
401 \end{vplace}\endoldlandscape
402 \pagestyle{plain}}
403 }{}
404 }{}
405 }

```