

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}
```

`\OnehalfSpacing`

`\DoubleSpacing`

`SingleSpace`

`\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. So we load `ifthen` package. 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 Global Setting

In this section, we define margins, spacings, indentations, hyphenations, and so on. The page is set by `\setpagecc` to be centered with respect to the stock.

```
13 \setpagecc{11in}{8.5in}{*}
```

The margins are set to be 1in for all left, right, upper, and lower margins.

```
14 \setlrmarginsandblock{1in}{*}{*}
15 \setulmarginsandblock{1in}{*}{*}
```

If there is a header, its height would be `\onelineskip`. If there is a footer, it would be `2\onelineskip` below the body text. The header would be `2\onelineskip` above the body text.

```
16 \setheadfoot{\onelineskip}{2\onelineskip}
17 \setheaderspaces{*}{2\onelineskip}{*}
```

By default, we use double spacing for the thesis/dissertaion.

```
18 \DoubleSpacing
```

The paragraph indentation is `2em`. `1em` is roughly the width of a capital “M” in the current font. We will also indent the first paragraph after a section heading.

```
19 \setlength{\parindent}{2em}
20 \let\@afterindentfalse\@afterindenttrue
21 \@afterindenttrue
```

We check and implement the layout settings.

```
22 \checkandfixthelayout
```

Moreover, we remove all interior spaces for list enviroments,

```
23 \tightlists % use \firmlists if vertical gaps is wanted
```

and prevent L^AT_EX from hyphenating the entire document.

```
24 \tolerance=1
25 \emergencystretch=\maxdimen
26 \hyphenpenalty=10000
27 \hbadness=10000
```

3.2.2 Front Matter

`\makefrontmatter` The `\makefrontmatter` will generate all front matter pages: `\maketitlepage` for Title Page, `\makecopyrightpage` for Copyright Page, `\makesubmittalpage` for Submittal Page, `\makeabstractpage` for Abstract, `\makecft` for Tables of Contents (toc) and Lists (List of Figures (lof) & List of Tables (lot)), `\makeacknowledgementpage` for Acknowledgments, and `\makededicationpage` for Dedication.

```
28 \newcommand{\makefrontmatter}{
29 \pagenumbering{roman}
30 \pagestyle{empty}
31 \maketitlepage
32 \makecopyrightpage
33 \pagestyle{plain}
34 \setcounter{page}{2}
35 \makesubmittalpage
36 \makeabstractpage
37 \makecft
38 \makeacknowledgementpage
39 \makededicationpage
40 \pagenumbering{arabic}
41 \setcounter{page}{1}
42 }
```

```

43 \newboolean{auto} % for auto pyramid
44 \setboolean{auto}{false}

45 \def\year#1{\gdef\@year{#1}}
46 \newcommand{\degree}[2]{\gdef\@degree{#1}\gdef\@degree{#2}}
47 \def\advisor#1{\gdef\@advisor{#1}}
48 \def\coadvisor#1{\gdef\@coadvisor{#1}}
49 \def\department#1{\gdef\@department{#1}}
50 \def\departmenthead#1{\gdef\@departmenthead{#1}}

```

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

```

51 \gdef\@author{Your Name}
52 \gdef\@title{This is the first line of a medium length title,
53 this is the second line}
54 \gdef\@year{2020}
55 \gdef\@degree{Doctor of Philosophy}
56 \gdef\@degree{Computer Science}
57 \gdef\@advisor{Dr. Main Advisor}
58 % ^^A \gdef\@coadvisor{Dr. Co Advisor}
59 \gdef\@department{Department of Some Name}
60 \gdef\@departmenthead{Dr. Department Head}

```

`\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).

```

61 \DeclareRobustCommand{\invpyr}[1]{
62 \vbox{
63 \vspace{10pt}
64 \hsize=\textwidth
65 \parindent=\z@
66 \emergencystretch=1in
67 \parshape 6
68 0.01\textwidth .98\textwidth
69 0.1\textwidth .8\textwidth
70 0.15\textwidth .7\textwidth
71 0.2\textwidth .6\textwidth
72 0.25\textwidth .5\textwidth
73 0.3\textwidth .4\textwidth
74 \leftskip=\z@ plus 1fil
75 \rightskip=\z@ plus -1fil
76 \parfillskip=\z@ plus 2fil
77 #1\par
78 }
79 }
80 \newcommand{\autotitle}{\setboolean{auto}{true}}
81 \newcommand{\maketitlepage}{
82 \clearpage
83 \begin{vplace}
84 \centering

```

```

85 \ifthenelse{\boolean{auto}}
86 {\invpyr{\MakeTextUppercase{\@title}}}
87 {\@title}
88 \end{vplace}
89 \begin{center}
90 by\\
91 \@author
92 \end{center}
93 \clearpage
94 }

```

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

```

95 \newcommand{\makecopyrightpage}{
96 \clearpage
97 \begin{vplace}[0.8]
98 \centering
99 Copyright~by~\@author~\@year\\
100 All~Rights~Reserved
101 \end{vplace}
102 \clearpage
103 }

```

`\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.

```

104 \newcommand{\makesubmittalpage}{
105 \clearpage
106 A thesis submitted to the Faculty and the Board of
107 Trustees of the Colorado School of Mines in partial
108 fulfillment of the requirements for the degree of
109 {\@degreelv} ({\@degreename}).
110
111 \vspace{2em}
112 \begin{flushleft}
113 Golden, Colorado\\[.5em]
114 Date \underline{\hspace{2in}}
115 \end{flushleft}
116
117 \vspace{.5em}
118 \begin{flushright}
119 Signed: \underline{\hspace{2in}}\\
120 {\@author}\\[2em]
121
122 Signed: \underline{\hspace{2in}}\\
123 \begin{SingleSpace}
124 {\@advisor}\\
125 Thesis Advisor\\[2em]

```

```

126 \end{SingleSpace}
127
128
129 \@ifundefined{@coadvisor}
130 {
131 \vspace{2.5em}
132 }
133 {
134 Signed: \underline{\hspace{2in}}\\
135 \begin{SingleSpace}
136 {\@coadvisor}\\
137 Thesis Advisor
138 \end{SingleSpace}
139 }
140
141 \end{flushright}
142
143 \begin{flushleft}
144 Golden, Colorado\\[.5em]
145 Date \underline{\hspace{2in}}
146 \end{flushleft}
147
148 \vspace{.5em}
149 \begin{flushright}
150 Signed: \underline{\hspace{2in}}\\
151
152 \begin{SingleSpace}
153 {\@departmenthead}\\
154 Professor and Head\\
155 {\@department}
156 \end{SingleSpace}
157
158 \end{flushright}
159
160 \clearpage
161 }

```

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

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

\@saveabstract And saving the abstract

```

163 \newcommand{\@saveabstract}[1]{
164 \long\gdef\@abstract{#1}
165 }

```

\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.

```
166 \newcommand{\makeabstractpage}{
```



```

167 \clearpage
168 \chapter*{Abstract}
169 \@abstract
170 \addcontentsline{toc}{chapter}{\abstractname}
171 \clearpage
172 }

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

\@saveacknowledgments And saving the acknowledgments
174 \newcommand{\@saveacknowledgments}[1]{
175 \long\gdef\@acknowledgments{#1}
176 }

\makeacknowledgementpage ACKNOWLEDGMENTS (Title) is centered horizontally, 1 keyboard return below
1 inch top margin and in ALL UPPER CASE LETTERS
177 \newcommand{\makeacknowledgementpage}{
178 \@ifundefined{@acknowledgments}{}{
179 \clearpage
180 \chapter*{Acknowledgments}
181 \@acknowledgments
182 \addcontentsline{toc}{chapter}{ACKNOWLEDGMENTS}
183 \clearpage
184 }
185 }

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

\@savededication And saving the dedication
187 \newcommand{\@savededication}[1]{
188 \long\gdef\@dedication{#1}
189 }

\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 some-
one'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.
190 \newcommand{\makededicationpage}{
191 \@ifundefined{@dedication}{}{
192 \clearpage
193 \@dedication

```

```

194 \clearpage
195 }
196 }

\l@chapapp  Redefine the generic chapter/appendix ToC entry typesetting.
197 \renewcommand{\l@chapapp}[3]{%
198 \ifnum \c@tocdepth >\m@ne
199 \begin{SingleSpace}
200 \cftchapterbreak
201 \vskip \cftbeforechapterskip
202 {
203 \leftskip \cftchapterindent\relax
204 %%%      \memRTLleftskip \cftchapterindent\relax
205 \rightskip \@tocrmarg
206 %%%      \memRTLrightskip \@tocrmarg
207 \parfillskip -\rightskip
208 %%%      \parfillskip -\memRTLrightskip
209 \parindent \cftchapterindent\relax
210 \@afterindenttrue
211 \interlinepenalty\@M
212 \leavevmode
213 \let\@cftbsnum \cftchapterpresnum
214 \let\@cftasnum \cftchapteraftersnum
215 \let\@cftasnumb \cftchapteraftersnumb
216 \def\@chapapp@head{#3}%
217 \settowidth{\@tempdima}{\cftchapterfont\@chapapp@head}%
218 \addtolength{\@tempdima}{\cftchapternumwidth}%
219 \advance\leftskip \@tempdima \null\nobreak\hskip -\leftskip
220 %%%      \advance\memRTLleftskip \@tempdima \null\nobreak\hskip -\memRTLleftskip
221 {\cftchapterfont {#1}}\nobreak
222 \cftchapterfillnum{#2}}
223 \end{SingleSpace}
224 \fi}

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

```

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

```

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

```

257 \renewcommand{\abstractname}{ABSTRACT}
258 \renewcommand{\chaptername}{CHAPTER}
259 \renewcommand{\appendixname}{APPENDIX}
260 \renewcommand{\contentsname}{TABLE OF CONTENTS}
261 \renewcommand{\listfigurename}{LIST OF FIGURES}
262 \renewcommand{\listtablename}{LIST OF TABLES}
263 %% for REFERENCE section
264 \renewcommand{\bibname}{REFERENCES}

```

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

```

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

```

```

282 \end{SingleSpace}%
283 \fi}

\l@section \l@section{<title>}{<page>} typesets the ToC entry for a \section heading.
284 \renewcommand{\@dotsep}{1}
285 \renewcommand{\l@section}{
286 \@dottedtocline@sec{1}{1.5em}{2.3em}
287 }

288 \renewcommand{\cftfigurename}{\figurename\space}
289 \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.
290 \let\oldl@figure=\l@figure
291 \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.
292 \let\oldl@table=\l@table
293 \renewcommand{\l@table}{\SingleSpacing\oldl@table}

```

3.2.3 Main Body

```

\chapter
294 \makechapterstyle{mineschapter}{%
295 \setlength{\midchapskip}{.2\baselineskip}
296 \setlength{\afterchapskip}{.2\baselineskip}
297 \renewcommand{\chapnumfont}{\normalfont}
298 \renewcommand{\chapttitlefont}{\normalfont}
299 \renewcommand{\chapterheadstart}{}
300 \renewcommand{\printchapternum}{}
301 \renewcommand{\printchapternonum}{}
302 \renewcommand{\printchaptername}{%
303 \centerline{\chapnumfont\MakeTextUppercase{\@chapapp\ thechapter}}}
304 \renewcommand{\printchaptertitle}[1]{%
305 \centering \vbox{\chapttitlefont\invpyr{\MakeTextUppercase{##1}}}
306 }
307 }
308 \chapterstyle{mineschapter}

\reproduceinfo Information about the reproduced chapter. Including the author, year, organiza-
tion, publisher.
309 \newcommand{\reproduceinfo}[1]{
310 \begin{center}
311 #1\par
312 \end{center}
313 }

```

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

```

314 \newcommand{\reproduceabstract}{
315 {\noindent Abstract\par}
316 }

```

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

```

317 \AtBeginDocument{
318 \setlength{\footmarkwidth}{\z@}
319 \setlength{\footmarksep}{-\footmarkwidth}
320 \setlength{\footparindent}{\footmarkwidth}
321 \renewcommand{\footnoterule}{%
322 \kern .5\baselineskip%
323 \hrule width \columnwidth \kern .5\baselineskip}
324 }

```

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

```

325 \newcommand{\symbolfootnote}[2]{
326 \renewcommand{\thefootnote}{\fnsymbol{footnote}}
327 \footnote[#1]{#2}
328 \renewcommand{\thefootnote}{\arabic{footnote}}
329 }

```

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

```

330 \renewcommand{\section}{\@startsection{section}
331 {1} % level
332 {\z@} % indent from left margin
333 {.1ex} % skip above heading
334 {.1ex} % heading between title and text
335 {\normalfont\normalsize\bfseries}}
336 \renewcommand{\subsection}{\@startsection{subsection}
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{\subsubsection}{\@startsection{subsubsection}
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}}

```

`longtable`

```

348 \AtBeginDocument{
349 \@ifpackageloaded{longtable}{
350 \setlength{\LTcapwidth}{\linewidth}
351 }

```

```

352 }{}
353 }

```

3.2.4 Back Matter

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

```

354 \AtBeginDocument{
355 \ifpackageloaded{natbib}{
356 \setlength{\bibhang}{\parindent}
357 \renewcommand{\bibpreamble}{\vspace{\parskip}}
358 }{}
359 }

```

`\bibliography`

```

360 \let\oldbibliography=\bibliography
361 \renewcommand{\bibliography}[1]{
362 \begin{SingleSpace}
363 \oldbibliography{#1}
364 \end{SingleSpace}
365 }

```

3.2.5 Others

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

```

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

```