

The mugsthesi s class

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Abstract

`mugsthesi s` is a document class to be used for typesetting Marquette University Graduate School (MUGS) theses and dissertations. It is based on the `memoir` class, and meets the basic requirements contained in the MUGS *Thesis/Dissertation Directives*.¹ The class provides a minimal set of changes to the `memoir` class to meet the university's specifications. As such, it should be compatible with any other packages that are compatible with the widely used `memoir` class.

1 Introduction

The `mugsthesi s` document class is designed to allow straightforward preparation of MUGS theses and dissertations using the L^AT_EX document preparation system. It complies with the MUGS *Thesis/Dissertation Directives* while maintaining compatibility with other packages used to extend the functionality of L^AT_EX.

Development of the document class is currently hosted on sourcehut². You are welcome to follow development, submit any issues you discover, or suggest improvements/enhancements using the web interface or mailing list there.

The easiest way to start using the `mugsthesi s` document class is to take a look at the sample document provided, `mugsthesi s_sample.tex`, along with its associated included files. You can take this as the basis for your own thesis or dissertation.

2 Package Options

The class supports several options for configuring the appearance of the thesis or dissertation. Apart from the options below, `memoir` is loaded with options `letterpaper` and `oneside` as specified in the *Thesis/Dissertation Directives*.

3 Document Type

The type of document, either a thesis or a dissertation, is adjusted through the use of the options `thesis` (default) and `dissertation`. `thesis` produces a thesis

¹`mugsthesi s` v1.1 is compatible with MUGS *Thesis Directives* dated 2014, available at <https://www.marquette.edu/grad/documents/thesis-directives-2014.pdf> and *Dissertation Directives* dated 2018, available at <https://www.marquette.edu/grad/documents/dissertation-directives.pdf>

²<https://sr.ht/~pdgessler/mugsthesi s/>

and `dissertation` produces a dissertation. Currently, the only difference is in the text on the title page. The document type options are mutually exclusive.

3.1 Font Size

The base font size of the document is adjusted through use of the options `10pt`, `11pt`, and `12pt` (default). The font size options are mutually exclusive; if more than one is specified, the default will be used.

3.2 Other Options

The options `final` (default) and `draft` configure the output document: `final` produces a camera-ready copy of the thesis, while `draft` marks overfull lines with black rules in the margins, and may have interaction with other packages. The most common interaction is that `graphicx` will place empty boxes instead of the actual graphics when the `draft` option is set. These options are mutually exclusive.

The options `indentfirsttrue` (default) and `indentfirstfalse` configure the indentation of the first paragraph following a heading. The *Thesis Directives* show indentation of the initial paragraphs and specify that “new paragraphs should be indented 0.5 in”. Centuries of typographers contend that the purpose of indentation is to mark the beginning of a new paragraph, and the heading itself serves that purpose for the first paragraph under a heading. So the `indentfirstfalse` option is provided if you agree with this contention. These options are mutually exclusive.

3.3 Unsupported memoir Options

The `memoir` class has many other options. Traditionally, an author can specify a base class option and the derived class will pass that option to the base class. However, many of these options would cause non-compliance with the MUGS *Thesis Directives*. For this reason, all unsupported options are reported to the log file and otherwise ignored.

4 Usage

A number of commands (macros) and environments are defined by `mugsthesis` for use in the preparation of theses. In-context examples of their use may be found in `mugsthesis_sample.tex`.

`\title` The `\title{title}` macro takes a single mandatory argument, which is the title of the thesis. Ensure that it is less than 120 characters long, and that it is entered with line breaks chosen to produce the requested inverted pyramid format. An example from the *Thesis Directives*:

```
\title{
  A STUDY OF THE SOCIOLOGICAL IMPACT OF THE\
  1984 OLYMPICS ON THE POVERTY\
  LEVEL OF CITIZENS OF\
  LOS ANGELES
}
```

The capitalization here is not strictly necessary; all letters are converted to upper case internally.

`\author` The macro `\author{author}` accepts a single mandatory argument, which should contain the author's name and credentials. Using the *Thesis Directives* example once again:

```
\author{John J. Smith, B.A.}
```

`\degree` The `\degree{degree}` macro takes a single mandatory argument, the degree pursued by the author. An example from the directives, as ever:

```
\degree{Master of Science}
```

`\degreemo` The macros `\degreemo{month}` and `\degreeyr{year}` each accept a single argument, which is the month and year, respectively, during which the degree is to be conferred. The value of *month* must be one of May, August, or December:

```
\degreemo{December}
\degreeyr{2013}
```

`\maketitle` The `\maketitle` command typesets the title page with all the previously-declared metadata, and should be used immediately at the beginning of the document environment.

`abstract (env.)` The environments `abstract` (mandatory), `acknowledgments` (optional), and

`acknowledgments (env.)` `dedication` (optional) should be used for the respective content, if included.

`dedication (env.)` The `abstract` environment must immediately follow `\maketitle`, and the `acknowledgments` and `dedication` environments, if used, should follow `abstract`.

`\tableofcontents` The Graduate School requires a table of contents to appear in every thesis.

`\listoftables` Additionally, lists of tables and lists of figures may be used. The commands

`\listoffigures` `\tableofcontents`, `\listoftables`, and `\listoffigures` should be used to generate these lists with the appropriate formatting. `\tableofcontents` should follow the abstract and any optional environments used in the front matter. `\listoftables` or `\listoffigures` should be used after `\tableofcontents`. If both are used, `\listoftables` should precede `\listoffigures`.

`\frontmatter` The switch commands `\frontmatter`, `\mainmatter`, and `\appendix` set the

`\mainmatter` page and chapter numbering styles for the appropriate parts of the thesis. They

`\appendix` should immediately precede the abstract, first main body chapter, and first appendix (if any), respectively.

`\bibname` The `\bibname` command contains the name text for the bibliography (default: BIBLIOGRAPHY). If the chosen citation/reference style specifies a different name (for example: REFERENCES), it can be changed with:

```
\renewcommand{\bibname}{REFERENCES}
```

Many other commands and environments are defined by the `memoir` class for document elements including (sub)figures, (sub)tables, associated captions, quotations, and more. Consult the `memoir` documentation³ for complete details. If these or customizations from other packages are used, it is ultimately the author's responsibility to verify that compliance with the *Thesis Directives* is maintained.

5 Implementation

First, load `etoolbox` for patching existing commands.

```
1 \RequirePackage{etoolbox}
```

³<http://texdoc.net/pkg/memoir>

Declare a new boolean to control indentation of initial paragraphs.

```
2 \newbool{indentfirst}
```

Declare class options, pass them to the base class if applicable, and discard any unsupported options, warning the user they have been ignored.

```
3 \DeclareOption{thesis}{\def\@mugsdoctype{Thesis}}
4 \DeclareOption{dissertation}{\def\@mugsdoctype{Dissertation}}
5 \DeclareOption{10pt}{\PassOptionsToClass{10pt}{memoir}}
6 \DeclareOption{11pt}{\PassOptionsToClass{11pt}{memoir}}
7 \DeclareOption{12pt}{\PassOptionsToClass{12pt}{memoir}}
8 \DeclareOption{final}{\PassOptionsToClass{final}{memoir}}
9 \DeclareOption{draft}{\PassOptionsToClass{draft}{memoir}}
10 \DeclareOption{indentfirsttrue}{\booltrue{indentfirst}}
11 \DeclareOption{indentfirstfalse}{\boolfalse{indentfirst}}
12 \DeclareOption*{%
13   \ClassWarning{mugsthesis}{Unknown option ‘\CurrentOption’ ignored}%
14 }
```

Execute default options `thesis`, `12pt`, `final`, and `indentfirsttrue`, and process the author-specified options.

```
15 \ExecuteOptions{thesis,12pt,final,indentfirsttrue}
16 \ProcessOptions\relax
```

Use the `indentfirst` package if `indentfirsttrue` is set.

```
17 \ifbool{indentfirst}{\RequirePackage{indentfirst}}{}
```

Load the base memoir class with options `letterpaper` and `oneside`.

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

Set the line spacing and justification according to the MUGS *Thesis Directives*. Additionally set `\raggedbottom` to avoid underfull `\hboxes` with rigid skip lengths.

```
19 \DoubleSpacing
20 \raggedright
21 \raggedbottom
```

Set the page layout.

```
22 \setlrmarginsandblock{1.5in}{1.0in}{*} % left and right margins
23 \setulmarginsandblock{1.0in}{1.0in}{*} % top and bottom margins
24 \setheaderspaces{0.5in}{*}{*} % header 0.5in from edge
25 \marginparmargin{left} % use the wider (left) margin for notes
26 \setmarginnotes{0.125in}{1.25in}{\baselineskip} % type area for notes
27 \checkandfixthelayout[lines] % check the layout; TODO check algorithm selection
```

Set the paragraph indentation.

```
28 \setlength\parindent{0.5in}
```

Define and use the `mugs` pagestyle for page numbering throughout the thesis.

```
29 \makepagestyle{mugs}
30 \makeevenhead{mugs}{}{\thepage}
31 \makeoddhead{mugs}{}{\thepage}
```

Alias the `chapter` pagestyle to `mugs` so the chapter opening pages have numbering identical to the rest of the pages, and set the page style for the document.

```
32 \aliaspagestyle{chapter}{mugs}
33 \pagestyle{mugs}
```

```
\degree Define \degree{(degree)} to set the degree name for the title page.
\degreemo 34 \newcommand{\degree}[1]{\def\mugsdegree{#1}}
\degreeyr
```

Similarly, define `\degreemo{<month>}` and `\degreeyr{<year>}` to set the date of conferral for the title and abstract pages.

```
35 \newcommand{\degreemo}[1]{\def\mugsdegreemo{#1}}
36 \newcommand{\degreeyr}[1]{\def\mugsdegreeyr{#1}}
```

`\title` Redefine `\title` to use full upper case.

```
37 \renewcommand{\title}[1]{\def\@title{\uppercase{#1}}}
```

`\maketitle` Redefine `\maketitle` to produce the appropriate title page, using all author metadata.

```
38 \renewcommand{\maketitle}{%
39   \cleardoublepage
40   \pagenumbering{Alph}
41   \SingleSpace
42   \thispagestyle{empty}
43   \centering
44   \@title
45   \vfill
46   by
47   \vskip \onelineskip
48   \@author
49   \vfill
50   A \mugsdoctype\ submitted to the Faculty of the Graduate School,\
51   Marquette University,\
52   in Partial Fulfillment of the Requirements for\
53   the Degree of \mugsdegree{}
54   \vfill
55   Milwaukee, Wisconsin
56   \vskip \onelineskip
57   \mugsdegreemo~\mugsdegreeyr
58   \clearpage
59 }
```

`abstract (env.)` Redefine the abstract environment for typesetting according to the directives.

```
60 \renewenvironment{abstract}{%
61   \thispagestyle{empty}
62   \begin{SingleSpace}
63   \begin{center}
64     ABSTRACT\
65     \@title
66     \vskip 2\onelineskip
67     \@author
68     \vskip \onelineskip
69     Marquette University, \mugsdegreeyr
70     \vskip 2\baselineskip
71   \end{center}
72   \@afterindentfalse\@afterheading % makes indentfirst work with custom envs
73 }{
74   \end{SingleSpace}\setcounter{page}{0}
75 }
```

`acknowledgments (env.)` Define the optional acknowledgments environment.

```
76 \newenvironment{acknowledgments}{%
```

```

77 \addcontentsline{toc}{chapter}{ACKNOWLEDGMENTS}
78 \chapter*{Acknowledgments}
79 \begin{SingleSpace}
80 \begin{center}
81 \unskip
82 \@author
83 \vskip 2\onelineskip
84 \end{center}
85 \@afterindentfalse\@afterheading
86 }\end{SingleSpace}}

```

`dedication` (*env.*) Define the optional dedication environment.

```

87 \newenvironment{dedication}{%
88 \addcontentsline{toc}{chapter}{DEDICATION}
89 \chapter*{Dedication}
90 \begin{SingleSpace}\vskip\onelineskip
91 \@afterindentfalse\@afterheading
92 }\end{SingleSpace}}

```

Declare subfloats using memoir facilities.⁴ Ensure any subfloats are listed in the list of figures and list of tables.

```

93 \newsfloat{figure}
94 \newsfloat{table}
95 \setcounter{lofdepth}{2}
96 \setcounter{lotdepth}{2}

```

Define and use the MUGS chapter style throughout the thesis.

```

97 \makechapterstyle{mugs}{%
98 \setlength{\midchapskip}{0pt}
99 \setlength{\afterchapskip}{0pt}
100 \renewcommand*\chapterheadstart{}
101 \renewcommand*\chaptitfont{\bfseries}
102 \renewcommand*\printchaptername{\centering \MakeTextUppercase{\@chapapp}}
103 \renewcommand*\printchapternum{\thechapter}
104 \renewcommand*\printchaptertitle[1]{%
105 \SingleSpacing \protect\parbox{\textwidth}{%
106 \centering \chaptitfont \MakeTextUppercase{##1}
107 }
108 }
109 }% end{mugs}
110 \chapterstyle{mugs}

```

Put the LoT and LoF on their own pages by patching their definitions.

```

111 \pretocmd{\listoftables}{\clearforchapter}{}{%
112 \ClassWarning{mugsthesis}{Patching ‘\noexpand\listoftables’ failed}
113 }
114 \pretocmd{\listoffigures}{\clearforchapter}{}{%
115 \ClassWarning{mugsthesis}{Patching ‘\noexpand\listoffigures’ failed}
116 }

```

`\contentsname` Style the ToC, LoT, LoF, and Bibliography headings.

`\listtablename` `\renewcommand*\contentsname}{TABLE OF CONTENTS}`

`\listfigurename`

`\bibname`

⁴These are not needed by all users; consider an option to enable? Maximum depth required?

```

118 \renewcommand*{\listtablename}{LIST OF TABLES}
119 \renewcommand*{\listfigurename}{LIST OF FIGURES}
120 \renewcommand*{\bibname}{BIBLIOGRAPHY}

```

Specify one line skip between bibliography entries.

```
121 \setlength{\bibitemsep}{\onelineskip}
```

`\prebibhook` Redefine `\prebibhook` to set single spacing in the bibliography and proper spacing after the heading.

```
122 \renewcommand*{\prebibhook}{\SingleSpacing\vskip\onelineskip}
```

`\biblistextra` Redefine `\biblistextra` to set item separation and indentation.

```

123 \renewcommand*{\biblistextra}{%
124   \setlength{\itemsep}{\bibitemsep}
125   \setlength{\leftmargin}{0.375in}% hanging indent
126   \setlength{\itemindent}{\labelwidth}%
127   \addtolength{\itemindent}{\labelsep}
128   \addtolength{\itemindent}{-\leftmargin}
129 }

```

`\tableofcontents` Do not place an entry for the ToC within the ToC itself.

```

130 \renewcommand{\tableofcontents}{%
131   \@ifstar{\mem@tableofcontents{01}}
132           {\mem@tableofcontents{01}}%
133 }

```

Set the indentation for the ToC, LoT, and LoF (0.5in additional per level).

```

134 \setlength{\cftchapterindent}{0.0in}
135 \setlength{\cftsectionindent}{0.5in}
136 \setlength{\cftsubsectionindent}{1.0in}
137 \setlength{\cftsubsubsectionindent}{1.5in}
138 \setlength{\cftparagraphindent}{2.0in}
139 \setlength{\cftsubparagraphindent}{2.5in}
140 \setlength{\cfttableindent}{0.0in}
141 \setlength{\cftsubtableindent}{0.5in}
142 \setlength{\cftfigureindent}{0.0in}
143 \setlength{\cftsubfigureindent}{0.5in}

```

Ragged right within and one line skip between ToC, LoT, and LoF entries.

```

144 \setrmarg{3.55em plus 1fil}
145 \setlength{\cftbeforechapterskip}{\onelineskip}
146 \setlength{\cftbeforesectionsip}{\onelineskip}
147 \setlength{\cftbeforesubsectionskip}{\onelineskip}
148 \setlength{\cftbeforesubsubsectionskip}{\onelineskip}
149 \setlength{\cftbeforeparagraphskip}{\onelineskip}
150 \setlength{\cftbeforesubparagraphskip}{\onelineskip}
151 \setlength{\cftbeforetableskip}{\onelineskip}
152 \setlength{\cftbeforesubtableskip}{\onelineskip}
153 \setlength{\cftbeforefigureskip}{\onelineskip}
154 \setlength{\cftbeforesubfigureskip}{\onelineskip}

```

`\insertchapterspace` No extra space between chapters.

```
155 \renewcommand{\insertchapterspace}{}
```

`\aftertoc` Switch to single spacing in the ToC, LoT, and LoF.
`\afterlottitle` 156 `\renewcommand{\aftertoc}{\vspace{-\onelineskip}\aftergroup\SingleSpacing}`
`\afterloftitle` 157 `\renewcommand{\afterlottitle}{\vspace{-\onelineskip}\aftergroup\SingleSpacing}`
158 `\renewcommand{\afterloftitle}{\vspace{-\onelineskip}\aftergroup\SingleSpacing}`

`\cftchapterfont` Style the ToC chapter headings.
`\cftchapterleader` 159 `\renewcommand{\cftchapterfont}{\normalfont}`
`\cftchapterpagefont` 160 `\renewcommand{\cftchapterleader}{\cftsectionleader}`
161 `\renewcommand{\cftchapterpagefont}{\normalfont}`

`\f@rtoc` For hyperref bookmarking functionality (if present).
162 `\AtEndPreamble{\providecommand{\texorpdfstring}[2]{#1}}`
163 `\settocpreprocessor{chapter}{%`
164 `\let\tempf@rtoc\f@rtoc%`
165 `\def\f@rtoc{%`
166 `\texorpdfstring{\MakeTextUppercase{\tempf@rtoc}}{\tempf@rtoc}}%`
167 `}`

Set spacing in quote and quotation environments.
168 `\AtBeginEnvironment{quote}{\par\SingleSpacing}`
169 `\AtBeginEnvironment{quotation}{\par\SingleSpacing}`

Set sectional unit numbering levels and ToC depth.
170 `\maxsecnumdepth{subsection}`
171 `\settocdepth{subsection}`

Style the lower-level headings.
172 `\newlength{\preheadskip}\setlength{\preheadskip}{1sp plus 1sp minus 1sp}`
173 `\newlength{\postheadskip}\setlength{\postheadskip}{\onelineskip}`
174 `\setsecheadstyle{\bfseries\SingleSpacing}`
175 `\setbeforesecskip{\preheadskip}`
176 `\setaftersecskip{\postheadskip}`
177 `\setsubsecheadstyle{\bfseries\SingleSpacing}`
178 `\setbeforesubsecskip{\preheadskip}`
179 `\setaftersubsecskip{\postheadskip}`
180 `\setsubsubsecheadstyle{\bfseries\SingleSpacing}`
181 `\setbeforesubsubsecskip{\preheadskip}`
182 `\setaftersubsubsecskip{\postheadskip}`

Set the list and table spacings.
183 `\tightlists`
184 `\AtBeginEnvironment{tabular}{\SingleSpacing}`

Set the caption styles and spacing.
185 `\captionstyle[\centering]{\raggedright}`
186 `\subcaptionsize{\small}`
187 `\setlength{\abovecaptionskip}{\parsep}`
188 `\setlength{\belowcaptionskip}{-\parsep}`

Avoid orphans, widows, and other detritus.
189 `\clubpenalty=10000`
190 `\widowpenalty=9996`
191 `\brokenpenalty=4991`
192 `\predisplaypenalty=10000`
193 `\postdisplaypenalty=1549`
194 `\displaywidowpenalty=1602`

Set the spacing between floats and surrounding elements.

```
195 \setlength{\floatsep}{3\onelineskip}
196 \setlength{\intextsep}{2\onelineskip}
197 \setlength{\textfloatsep}{2\onelineskip}
198 \setlength{\dblfloatsep}{2\onelineskip}
199 \setlength{\dbltextfloatsep}{2\onelineskip}
```

Change History

v1.0 options for theses and dissertations 1

General: Initial public release 1

v1.1

General: Added document type

Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in *roman* refer to the code lines where the entry is used.

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