The `ut-thesis` class *

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Abstract

The `ut-thesis` document class and template implements the requirements of the University of Toronto School of Graduate Studies (SGS), as of Winter 2020.

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1 Usage

```
\documentclass{ut-thesis}
\documentclass[...options...]{ut-thesis}
```

The default settings produce a final copy, ready for submission to the School of Graduate Studies (SGS) at the University of Toronto: single-sided, "normal" margins (see below), one-and-a-half spaced with single-spaced notes.

1.1 Options

- Any standard option for the LaTeX2e `book` class, including `10pt`, `11pt`, `12pt`, `oneside`, `twoside`, etc.

- `narrowmargins`, `normalmargins`, `widemargins`, or `extrawidemargins`: Set the size of the margins, as follows: . `narrow`: 1 1/4″ on the left, 3/4″ on all other sides, headers & footers 3/8″ from body (these are the minimum values required by SGS); . `normal`: 1 1/4″ on the left, 1″ on all other sides, headers & footers 1/2″ from body; . `wide`: 1 1/4″ on all sides, headers & footers 5/8″ from body; . `extrawide`: 1 1/2″ on all sides, headers & footers 3/4″ from body. If you have more than just a few marginal notes, it is recommended that you use at least `wide` margins. For other settings, use the `\geometry` command (see the template for details).

- `singlespaced`, `oneandahalfspaced`, or `doublespaced`: Set the entire document's default line spacing (except for notes, which are single-spaced by default). For other settings, use the `\setstretch` command (see the template for details).

- `singlespacednotes` or `standardspacednotes`: Set line spacing for footnotes and marginal notes: either single-spaced or the same as the rest of the document.

- `cleardoublepagestyleempty`, `cleardoublepagestyleplain`, or `cleardoublepagestylestandard`: Set the page style for all "cleared" pages (empty pages inserted in two-sided documents to put the next page on the right-hand side) to either `empty`, `plain`, or whatever style is in effect when the page is cleared (the default).

- `draft`: Produce a draft copy (double-sided, double-spaced, normal margins, with the word "DRAFT" printed at all four corners of every page).

Note that these options can be used to override the default or draft document settings, so that it is possible, for example, to create a double-sided final copy, or a 1 1/2-spaced draft copy with wide margins, etc. You may use standard LaTeX packages to tailor the layout and formatting in other ways. Also note that when producing double-sided documents while *not* in draft mode, new chapters and preliminary sections will always start on a right-hand page under the default settings (inserting a blank page if needed). This can be overridden by using the `openany` or `openright` options. To achieve this effect for individual sections or chapters, use `\cleardoublepage` – or one of the more specific `\clearemptydoublepage`, `\clearplaindoublepage`, `\clearthesisdoublepage`, or `\clearstandarddoublepage` (see below for details).

1.2   Environments & Commands

* `\degree{...}`: (preamble only; REQUIRED) Specify the name of the degree (e.g., "Doctor of Philosophy").

* `\department{...}`: (preamble only; REQUIRED) Specify the name of the graduate department.

* `\gradyear{...}`: (preamble only; REQUIRED) Specify the year of graduation (defaults to current year).

* `\author{...}`: (preamble only; REQUIRED) Specify the name of the author.

* `\title{...}`: (preamble only; REQUIRED) Specify the title of the thesis.

- `\begin{preliminary}...\end{preliminary}`: Delimit head matter (title page, abstract, table of contents, lists of tables and figures, etc.): set the page style and numbering for the preliminary sections and reset them for the main document.

- `\maketitle`: Generate the title page from the information supplied in the preamble.

- `\begin{abstract}...\end{abstract}`: Generate the abstract page, double-sided. (According to SGS guidelines, this must immediately follow the title page.)

- `\begin{dedication}...\end{dedication}`: Generate a dedication section, if needed (just a paragraph formatted flush right).

- `\begin{acknowledgements}...\end{acknowledgements}`: Generate an acknowledgements section, if needed.

Note that neither the `dedication` nor the `acknowledgements` are put on a separate page by default (use `\newpage` to do this explicitly). Also note that the table of contents, list of tables, and list of figures can be generated using the usual LaTeX commands.

- `\begin{longquote}...\end{longquote}`: Single-spaced version of the `quote` environment.

- `\begin{longquotation}...\end{longquotation}`: Single-spaced version of the `quotation` environment.

- `\clearemptydoublepage`, `\clearplaindoublepage`, `\clearthesisdoublepage`: Same as `\cleardoublepage` except that cleared pages have style `empty`, `plain`, or `thesis` respectively.

- `\clearstandarddoublepage`: Same as the original `\cleardoublepage` (cleared pages use the style currently in effect) – used to override the effects of options `cleardoublepagestyleempty` or `cleardoublepagestyleplain`.

The companion file `ut-thesis.tex` contains a skeleton illustrating the use of this class.

2 Implementation

2.1 Option Declaration

2.1.1 Draft Mode

Specifying `draft` adds "DRAFT" to all 4 corners, plus the date centered below the footer. The default `draft` behaviour for the `book` class is also supported.

```
1 \newcommand{\draftmarkstyle}{\scriptsize\sffamily}
2 \DeclareOption{draft}{%
3   \PassOptionsToClass{\CurrentOption}{book}
4   \AtEndOfClass{
5     \AtBeginShipout{\AtBeginShipoutUpperLeft{%
6       \draftmarkstyle
7       \put(+0.125in,              -0.125in-\f@size pt  ){\rlap{DRAFT}}
8       \put(-0.125in+\paperwidth,-0.125in-\f@size pt  ){\llap{DRAFT}}
9       \put(+0.125in,              +0.125in-\paperheight){\rlap{DRAFT}}
10      \put(-0.125in+\paperwidth,+0.125in-\paperheight){\llap{DRAFT}}
11      \put(\leftmargin+0.5\textwidth,+0.125in-\paperheight)%
12        {\makebox[0in][c]{\today}}
13 }}}}
```

2.1.2 Margins

First, we define three lengths to help us compute the margins: `\margin@v` is the top and bottom margins; `\margin@xhi` is the inner margin offset; `\margin@xho` is the outer margin offset.

```
14 \newlength{\margin@v}
15 \newlength{\margin@xhi}\setlength{\margin@xhi}{0.5in}
16 \newlength{\margin@xho}\setlength{\margin@xho}{0.0in}
```

The options are based off `\margin@v`:

```
17 \DeclareOption{narrowmargins}    {\setlength{\margin@v}{0.75in}}
18 \DeclareOption{normalmargins}    {\setlength{\margin@v}{1.00in}}
19 \DeclareOption{widemargins}      {\setlength{\margin@v}{1.25in}}
20 \DeclareOption{extrawidemargins}{\setlength{\margin@v}{1.50in}}
```

For digital copies, `equalmargins` may be preferred. However, to keep the `\textwidth` consistent for any of the above margin options with and without `equalmargins`, we simply average the inner and outer offsets:

```
21 \DeclareOption{equalmargins}%
22   {\setlength{\margin@xho}{0.5\margin@xhi}
23    \setlength{\margin@xhi}{0.5\margin@xhi}}
```

5

Finally, we actually compute the margins using the above three lengths, and adjust the placement of the header, footer, and margin notes.

```
24 \AtEndOfClass{
25   \setlength{\leftmargin}{\dimexpr\margin@v+\margin@xhi}
26   \setlength{\rightmargin}{\dimexpr\margin@v+\margin@xho}
27   \geometry{
28     top       = \margin@v,
29     bottom    = \margin@v,
30     inner     = \leftmargin,
31     outer     = \rightmargin,
32     headsep   = \dimexpr 0.5\margin@v - \headheight,
33     footskip  = \dimexpr 0.5\margin@v,
34     marginparwidth = \dimexpr \rightmargin - 0.25in,
35     marginparsep   = 0.125in,
36 }}
```

2.1.3 Line Spacing

We're using the `setspace` package. We simply call one of the spacing commands after the class is loaded. So, be careful to place any line spacing commands within a group, or the global setting can be changed in the middle of the document. The default is `onehalfspacing`.

```
37 \DeclareOption{doublespacing}{%
38   \AtEndOfClass{\doublespacing}
39 }
40 \DeclareOption{onehalfspacing}{%
41   \AtEndOfClass{\onehalfspacing}
42 }
43 \DeclareOption{singlespacing}{%
44   \AtEndOfClass{\singlespacing}
45 }
```

2.1.4 Book Options

Finally, we try to process all remaining options using the `book` class, so the usual options and default values should be defined, like:

- page size: e.g. `letterpaper`, `a4paper`, …

- font size: e.g. `10pt`, `11pt`, `12pt`

- open side for twoside: e.g. `openright`, `openany`

```
46 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{book}}
```

2.1.5 Default Options & Processing

Executing the default options and processing. Any remaining options should now raise an error like: `LaTeX Warning: Unused global option(s): ...`

```
47 \ExecuteOptions{letterpaper} % book
48 \ExecuteOptions{normalmargins,onehalfspacing,chapterhead} % ut-thesis
49 \ProcessOptions
```

2.2 Initialization

We load the `book` class and the required packages.

```
50 \LoadClass{book}
51 \RequirePackage{picture}  % for draft mode
52 \RequirePackage{atbegshi} % for draft mode
53 \RequirePackage{geometry} % for margins etc.
54 \RequirePackage{setspace} % for line spacing
```

2.3 Author Information

Getting the user inputs.

```
55 \renewcommand*{\author}   [1]{\gdef\@author{#1}}
56 \renewcommand*{\title}    [1]{\gdef\@title{#1}}
57 \newcommand*{\degree}     [1]{\gdef\@degree{#1}}
58 \newcommand*{\department}[1]{\gdef\@department{#1}}
59 \newcommand*{\gradyear}   [1]{\gdef\@gradyear{#1}}
```

Setting default values that will hopefully be overwritten.

```
60 \author     {(author)}
61 \title      {(title)}
62 \degree     {(degree)}
63 \department{(department)}
64 \gradyear   {(gradyear)}
```

2.4 Front Matter

2.4.1 Matter Commands

We enforce that the `\frontmatter` and `\mainmatter` use the right page numbering and styles. Also, if we are using `twoside`, then we need to reduce all page numbers in

the front matter by 1, so that the `abstract` is page "ii". Note that adjusting the `page` counter directly causes typesetting problems, such as incorrect alternating margins.

```
65 \newcommand{\@romanskip}[1]{\@roman{\if@twoside\numexpr#1-1\else#1\fi}}
66 \g@addto@macro\frontmatter{\pagenumbering{romanskip}\pagestyle{plain}}
67 \g@addto@macro\mainmatter {\pagenumbering{arabic}\pagestyle{headings}}
```

2.4.2 Title Page

We don't enforce firm distances between lines, but use `\vfill` to stretch and fill the space evenly, except for a double-sized gap after the author name. There is one part of space above the title, while the copyright is pushed all the way to the bottom.

```
68 \renewcommand*{\maketitle}%
69   {\thispagestyle{empty}
70    \large
71    \begin{center}
72       \singlespacing
73       \null
74       \vfill
75       \textsc{\@title}
76       \vfill
77       by
78       \vfill
79       {\@author}
80       \vfill
81       \vfill
82       A thesis submitted in conformity with the requirements\\
83       for the degree of {\@degree}\\[1ex]
84       Graduate Department of {\@department}\\
85       University of Toronto\\
86       \vfill
87       {\copyright} Copyright {\@gradyear} by {\@author}
88    \end{center}
89    {{\pagestyle{empty}\ocleardoublepage}}
90    }
```

2.4.3 Abstract Page

The abstract is an environment, but it creates its own page (and possibly an extra empty page if using `twoside`). The author and title info is centered and singlespaced. The word "Abstract" uses the `\section*` style, without any numbering. The abstract content is doublespaced.

```
91 \newenvironment*{abstract}%
```

```
92  {\thispagestyle{plain}
93   \begin{center}
94     \singlespacing
95       {\@title}\\[2ex]
96       {\@author}\\
97       {\@degree}\\[1ex]
98       Graduate Department of {\@department}\\
99       University of Toronto\\
100      {\@gradyear}\\
101      \section*{Abstract}
102   \end{center}
103   \begingroup
104   \doublespacing}%
105 {\endgroup\cleardoublepage}
```

2.4.4 Dedication

The `dedication` environment is just a paragraph formatted flush right (not a new page).

```
106 \newenvironment*{dedication}%
107   {\begin{flushright}}%
108   {\end{flushright}}
```

2.4.5 Acknowledgments

Similarly, the `acknowledgements` is just standard text with a heading (not a new page).

```
109 \newenvironment*{acknowledgements}%
110   {\begin{center}
111       \section*{Acknowledgements}
112    \end{center}
113    \begingroup\noindent}%
114  {\par\endgroup}
```

2.5 Page Styles

2.5.1 Blank Pages

By defauly, all blank pages will have page style `plain`, but the original definition is stored in `\ocleardoublepage`.

```
115 \let\ocleardoublepage\cleardoublepage
116 \def\cleardoublepage{{\newpage\pagestyle{plain}\ocleardoublepage}}
```

2.5.2 Headings

We redefine the `headings` page style with a new formatting hook `\headerstyle{}`, but is otherwise similar to the original `headings`.

```
117 \newcommand{\headerstyle}[1]{\footnotesize\MakeUppercase{#1}}
118 \if@twoside
119 \renewcommand*{\ps@headings}%
120   {\let\@mkboth\markboth
121    \let\@oddfoot\@empty
122    \let\@evenfoot\@empty
123    \def\@oddhead{\headerstyle{\rightmark\hfil\thepage}}%
124    \def\@evenhead{\headerstyle{\thepage\hfil\leftmark}}%
125    \def\chaptermark##1{\markboth{%
126      \if@mainmatter\headerstyle{\@chapapp\ \thechapter.\ ##1}\fi}{}}
127    \def\sectionmark##1{\markright{%
128      \if@mainmatter\headerstyle{\thesection.\ ##1}\fi}}}
129 \else
130 \renewcommand*{\ps@headings}%
131   {\let\@mkboth\markboth
132    \let\@oddfoot\@empty
133    \let\@evenfoot\@empty
134    \def\@oddhead{\headerstyle{\rightmark\hfil\thepage}}%
135    \def\chaptermark##1{\markright{%
136      \if@mainmatter\headerstyle{\@chapapp\ \thechapter.\ ##1}\fi}}}
137 \fi
```

Default page style.

```
138 \pagestyle{headings}
```