

LaTeX Template Documentation

A Comprehensive Guide to Use the Template from
<https://github.com/tquaritsch/LaTeX-KOMA-template>

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July 12, 2013

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1 How to use this L^AT_EX document template

This L^AT_EX document template from L^AT_EX@TU Graz¹ is based on KOMA script². You don't need any special KOMA knowledge (but it won't hurt either). It provides an easy to use and easy to modify template. All settings are documented and many references to additional information sources are given.

In general, there should not be any reason to modify a file in the `template` folder. *All important settings are accessible in the main folder, mostly in the `main.tex` file.* This way, it is easy to get what you need and you can update the template independent of the content of the document.

The *absolute minimum you should read* is listed below and marked with the hand symbol:



- Section 1.1: basic configuration of this template.
- Section 1.3: how to generate the PDF file
- Section 3.4: using biblatex (instead of bibtex)

In order to get a perfect resulting document and to get an exciting experience with this template, you should definitely consider reading following sections which are also marked with the pencil symbol:



- Section 1.5: extend the template with your own usepackages, newcommands, and so forth
- Section 4: pre-defined commands to make your life easier (e.g., including graphics)
- Section 5.4: how to do acronyms (like ACME) beautifully
- Section 5.8: how to “quote” text and use parentheses correctly

The other sections describe all other settings for the sake of completeness. This is interesting for learning more about L^AT_EX and modifying this template to a higher level of detail.

¹<http://LaTeX.TUGraz.at>

²<http://komascript.de/>

1.1 Six Steps to Customize Your Document



This template is optimized to get to the first draft of your thesis very quickly. Follow these instructions and you get most of your customizing done in a few minutes:

1. Modify settings in `main.tex` to meet your requirements:
 - Basic settings
 - Paper size, languages, font size, citation style, title page, and so forth
 - Document metadata
 - Preferences like `myauthor`, `mytitle`, and so forth
2. Replace `figures/institution.pdf` with the logo of your institution in either PDF or PNG format.³
3. Further down in `main.tex`:
 - Create your desired structure for the chapters (`\include{introduction}`, `\include{evaluation}`, ...)
4. Create the \TeX files and fill your content into these files you defined in the previous step.
5. Optionally: Modify `colophon.tex` to meet your situation.
 - Please spend a couple of minutes and think about putting your work under an open license⁴ in order to follow the spirit of Open Science⁵.
6. In case you are using GNU make⁶: Put your desired PDF file name in the second line of file `Makefile`
 - replace “Projectname” with your filename
 - do not use any file extension like `.tex` or `.pdf`

³Avoid JPEG format for computer-generated (pixel-oriented) graphics like logos or screenshots in general. The JPEG format is for photographs *only*.

⁴<https://creativecommons.org/licenses/>

⁵https://en.wikipedia.org/wiki/Open_science

⁶If you don't know, what GNU make is, you are not using it (yet).

1.2 License

This template is licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0) license⁷:

- You can share (to copy, distribute and transmit) this template.
- You can remix (adapt) this template.
- You can make commercial use of the template.
- In case you modify this template and share the derived template: You must attribute the template such that you do not remove (co-)authorship of Karl Voit and you must not remove the URL to the original repository on github⁸.
- If you alter, transform, or build a new template upon this template, you may distribute the resulting template only under the same or similar license to this one.
- There are *no restrictions* of any kind, however, related to the resulting (PDF) document!
- You may remove the colophon (but it's not recommended).

1.3 How to compile this document



I assume that compiling \LaTeX documents within your software environment is something you have already learned. This template is almost like any other \LaTeX document except it uses state-of-the-art tools for generating things like the list of references using biblatex/biber (see Section 3.4 for details). Unfortunately, some \LaTeX editors do not support this much better way of working with bibliography references yet. This section describes how to compile this template.

1.3.1 Compiling Using a \LaTeX Editor

Please do select `main.tex` as the “main project file” or make sure to compile/run only `main.tex` (and not `introduction.tex` or other \TeX files of this template).

⁷<https://creativecommons.org/licenses/by-sa/3.0/>

⁸<https://github.com/novoid/LaTeX-KOMA-template>

Choose biber for generating the references. Modern LaTeX environments offer this option. Older tools might not be that up-to-date yet.

1.3.2 Activating biber in the \LaTeX editor TeXworks

The TeXworks editor is a very basic (but fine) \LaTeX editor to start with. It is included in MiKTeX and MiKTeX portable and supports syntax highlighting and SyncTeX to synchronize PDF output and \LaTeX source code.

Unfortunately, TeXworks shipped with MiKTeX does not support compiling using biber (bibtex) out of the box. Here is a solution to this issue. Go to TeXworks: Edit \rightarrow Preferences ... \rightarrow Typesetting \rightarrow Processing tools and add a new entry (using the plus icon):

Name: pdflatex+biber
Program: *find the template/pdflatex+biber.bat file from your disk*
Arguments: \$fullname
 \$basename

Activate the “View PDF after running” option.

Close the preferences dialog and you will now have an additional choice in the drop down list for compiling your document. Choose the new entry called pdflatex+biber and start a happier life with biber.

In case your TeXworks has a German user interface, here the key aspects in German as well:

Bearbeiten \rightarrow Einstellungen ... \rightarrow Textsatz \rightarrow Verarbeitungsprogramme
 \rightarrow + (*neues Verarbeitungsprogramm*):

Name: pdflatex+biber
Befehl/Datei: *die template/pdflatex+biber.bat im Laufwerk suchen*
Argumente: \$fullname
 \$basename

»PDF nach Beendigung anzeigen« aktivieren.

1.3.3 Compiling Using gnu make

With GNU make⁹ it is just simple as that: `make pdf`

Several other targets are available. You can check them out by executing:
`make help`

1.3.4 Compiling in a Text-Shell

To generate a document using Biber, you can stick to following example:

```
pdflatex main.tex
biber main
pdflatex main.tex
pdflatex main.tex
```

1.4 How to get rid of the template documentation

Simply remove the files `Template_Documentation.pdf` and (if it exists) `Template_Documentation.tex` in the main folder of this template.

1.5 What about modifying or extending the template?



This template provides an easy to start \LaTeX document template with sound default settings. You can modify each setting any time. It is recommended that you are familiar with the documentation of the command whose settings you want to modify.

It is recommended that for *adding* things to the preamble (newcommands, setting variables, defining headers, ...) you should use the file `main.tex`. There are comment lines which help you find the right spot. This way you still have the chance to update your template folder from the template repository without losing your own added things.

The following sections describe the settings and commands of this template and give a short overview of its features.

⁹https://secure.wikimedia.org/wikipedia/en/wiki/Make_%28software%29

1.6 How to change the title page

This template comes with a variety of title pages. They are located in the folder `template`. You can switch to a specific title page by including the corresponding title page file in the file `main.tex`.

Please note that you may not need to modify any title page document by yourself since all relevant information is defined in the file `main.tex`.

2 `tugthesis.cls` – Basic Class File

The file `tugthesis.cls` defines the commands for meta information, e.g. `THSauthor{...}`, `THStitle{...}`, ... and class options like `fontsize=12pt`. You can modify or complement those definitions easily by mimicking the existing ones. The class file also defines the order of the document elements at the beginning (colophon, title page, statutory declaration, ...) in the `AtBeginDocument` command at the end of the file. The files in the `template` directory are included from `tugthesis.cls`.

3 `preamble.tex` — Main preamble file

In the file `preamble/preamble.tex` you will find the basic definitions related to your document. This template uses the KOMA script extension package of L^AT_EX.

There are comments added to the `\documentclass{}` definitions. Please refer to the great documentation of KOMA¹⁰ for further details.

What should I do with this file? For standard purposes you might use the default values it provides. You must not remove its `include` command in `main.tex` since it contains important definitions. This file contains settings which are documented well and can be modified according to your needs. It is recommended that you fully understand each setting you modify in order to get a good document result. However, you can set basic values in

¹⁰`scrguide.pdf` for German users

the `main.tex` file: font size, paper size, paragraph separation mode, draft mode, binding correction, and whether your document will be a one sided document or you are planning to create a document which is printed on both, left side and right side.

3.1 `inputenc`: UTF8 as input charset

You are able and should use UTF8 character settings for writing these \TeX -files.

3.2 `babel`: Language settings

The default setting of the language is American. Please change settings for additional or alternative languages used in `main.tex`.

Please note that the default language of the document is the *last* language which is added to the package options.

To set only parts of your document in a different language as the rest, use for example `\foreignlanguage{ngerman}{Beispieltext in deutscher Sprache}`. For using foreign language quotes, please refer to the `\foreignquote`, `\foreigntextquote`, or `\foreignblockquote` provided by `csquotes` (see Section 5.8).

3.3 `scrpage2`: Headers and footers

Since this template is based on KOMA script it uses its great `scrpage2` package for defining header and footer information. Please refer to the KOMA script documentation how to use this package.

3.4 References



This template is using `biblatex` and `Biber` instead of `BibTeX`. This has the following advantages:

- better documentation
- Unicode-support like German umlauts (ö, ä, ü, ß) for references

- flexible definition of citation styles
- multiple bibliographies e. g. for printed and online resources
- cleaner reference definition e. g. inheriting information from Proceedings to all related InProceedings
- modern implementation

In short, biblatex is able to handle your bib-files and offers additional features. To get the most out of biblatex, you should read the very good package documentation. Be warned: you'll probably never want to change back to BibTeX again.

Take a look at the files `references-bibtex.bib` and `references-biblatex.bib`: they contain the three references `tagstore`, `Voit2009`, and `Voit2011`. The second file is optimized for biblatex and takes advantage of some features that are not possible with BibTeX.

This template is ready to use biblatex with Biber as reference compiler. You should make sure that you have installed an up to date binary of Biber from its homepage¹¹.

In `main.tex` you can define several general biblatex options: citation style, whether or not multiple occurrences of authors are replaced with dashes, or if backward references (from references to citations) should be added.

If you are using the LaTeX editor TeXworks, please make sure that you have read Section 1.3.2 in order to use biber.

3.4.1 Example citation commands

This section demonstrates some example citations using the style `authoryear`. You can change the citation style in `main.tex` (`mybiblatexstyle`).

- `cite` Eijkhout, 2008 and `cite` Bringhurst, 1993; Eijkhout, 2008.
- `citet` Eijkhout (2008) and `citet` Bringhurst (1993); Eijkhout (2008).
- `autocite` (Eijkhout, 2008) and `autocite` (Bringhurst, 1993; Eijkhout, 2008).
- `autocites` (Eijkhout, 2008) and `autocites` (Bringhurst, 1993; Eijkhout, 2008).
- `citeauthor` Eijkhout and `citeauthor` Bringhurst; Eijkhout.
- `citetitle` *TeX by Topic, a T_EXnician's Reference* and `citetitle` *The Elements of Typographic Style; T_EX by Topic, a T_EXnician's Reference*.

¹¹<http://biblatex-biber.sourceforge.net/>

- citeyear 2008 and citeyear 1993; 2008.
- textcite Eijkhout (2008) and textcite Bringhurst (1993); Eijkhout (2008).
- smartcite¹² and smartcite¹³.
- footcite¹⁴ and footcite¹⁵.
- footcite with page¹⁶ and footcite with page¹⁷.
- fullcite Victor Eijkhout (May 2008). *T_EX by Topic, a T_EXnician's Reference*. document revision 1.2. URL: <http://www.eijkhout.net/texbytopic/texbytopic.html> and fullcite Robert Bringhurst (1993). *The Elements of Typographic Style*. first edition; Victor Eijkhout (May 2008). *T_EX by Topic, a T_EXnician's Reference*. document revision 1.2. URL: <http://www.eijkhout.net/texbytopic/texbytopic.html>.

Please note that the citation style as well as the bibliography style can be changed very easily. Refer to the settings in `main.tex` as well as the very good documentation of `biblatex`.

3.4.2 Using this template with apa style

First, you have to have the APA `biblatex` style installed. Modern L^AT_EX distributions do come with `biblatex` and APA style. If so, you will find the files `biblatex-apa.pdf` (style documentation) and `biblatex-apa-test.pdf` (file with citation examples) on your hard disk.

1. Change the style according to `\newcommand{\mybiblatexstyle}{apa}`
2. Add `\DeclareLanguageMapping{american}{american-apa}` or `\DeclareLanguageMapping{german}{german-apa}` to your preamble¹⁸

These steps change the `biblatex` style to APA style

3.4.3 Using this template with BibT_EX

If you do not want to use Biber and `biblatex`, you have to change several things:

¹²Eijkhout, 2008.

¹³Bringhurst, 1993; Eijkhout, 2008.

¹⁴Eijkhout, 2008.

¹⁵Bringhurst, 1993; Eijkhout, 2008.

¹⁶Eijkhout, 2008, p.42.

¹⁷compare Eijkhout, 2008, p. 42.

¹⁸You might want to use section “MISC self-defined commands and settings” for this.

- in `preamble/preamble.tex`
 - remove the `usepackage` command of `biblatex`
 - remove the `\addbibresource{...}` command
- in `main.tex`
 - replace `\printbibliography` with the usual `\bibliographystyle{yourstyle}` and `\bibliography{yourbibfile}`
- if you are using GNU make: modify `Makefile`
 - replace `BIBTEX_CMD = biber` with `BIBTEX_CMD = bibtex`
- Use the reference file `references-bibtex.bib` instead of `references-biblatex.bib`

3.5 Miscellaneous packages

There are several packages included by default. You might want to activate or deactivate them according to your requirements:

- graphicx** The widely used package to use graphical images within a \LaTeX document.
- pifont** For additional special characters available by `\ding{}`
- ifthen** For using if/then/else statements for example in macros
- eurosym** Using the character for Euro with `\officialeuro{}`
- xspace** This package is required for intelligent spacing after commands
- xcolor** This package defines basic colors. If you want to get rid of colored links and headings please change corresponding value in `main.tex` to `{0,0,0}`.
- ulem** This package offers strikethrough command `\sout{foobar}`.
- framed** Create framed, shaded, or differently highlighted regions that can break across pages. The environments defined are
- `framed`: ordinary frame box (`\fbox`) with edge at margin
 - `shaded`: shaded background (`\colorbox`) bleeding into margin
 - `snugshade`: similar
 - `leftbar`: thick vertical line in left margin
- eso-pic** For example on title pages you might want to have a logo on the upper right corner of the first page (only). The package `eso-pic` is able to place things on absolute and relative positions on the whole page.

- enumitem** This package replaces the built-in definitions for `enumerate`, `itemize` and `description`. With `enumitem` the user has more control over the layout of those environments.
- todonotes** This package is *very* handy to add notes¹⁹. Using for example `\todo{check}` results in something like this in the document. Do read the great package documentation for usage of other very helpful commands such as `\missingfigure{}` and `\listoftodos`. The latter one creates an index of all open todos which is very useful for getting an overview of open issues. The package `todonotes` requires the packages `ifthen`, `xkeyval`, `xcolor`, `tikz`, `calc`, and `graphicx`. Activate and configure `\listoftodos` in `main.tex`. check
- units** For setting correctly typesetted units and nice fractions with `\unit[42]{m}` and `\unitfrac[100]{km}{h}`.

4 `mycommands.tex` — various definitions



In file `template/mycommands.tex` many useful commands are being defined.

What should I do with this file? Please take a look at its content to get the most out of your document.

One of the best advantages of L^AT_EX compared to WYSIWYG software products is the possibility to define and use macros within text. This empowers the user to a great extent. Many things can be defined using `\newcommand{}` and automates repeating tasks. It is recommended to use macros not only for repetitive tasks but also for separating form from content such as CSS does for XHTML. Think of including graphics in your document: after writing your book, you might want to change all captions to the upper side of each figure. In this case you either have to modify all `includegraphics` commands or you were clever enough to define something like `\myfig`²⁰. Using a macro for including graphics enables you to modify the position caption on only *one* place: at the definition of the macro.

¹⁹`todonotes` replaced the `fixxme`-command which previously was defined in the `preamble.mycommands.tex` file.

²⁰See below for a detailed description

The following section describes some macros that came with this document template from L^AT_EX@TU Graz and you are welcome to modify or extend them or to create your own macros!

4.1 myfig — including graphics made easy

The classic: you can easily add graphics to your document with `\myfig`:

```
\myfig{flower}%% filename w/o extension in the folder figures
    {width=0.7\textwidth}%% maximum width/height, aspect ratio will be kept
    {This flower was photographed at my home town in 2010}%% caption
    {Home town flower}%% optional (short) caption for list of figures
    {fig:flower}%% label
```

There are many advantages of this command (compared to manual figure environments and `includegraphics` commands:

- consistent style throughout the whole document
- easy to change; for example move caption on top
- much less characters to type (faster, error prone)
- less visual clutter in the T_EX-files

4.2 myclone — repeat things!

Using `\myclone[42]{foobar}` results the text “foobar” printed 42 times. But you can not only repeat text output with `myclone`. Default argument for the optional parameter “number of times” (like “42” in the example above) is set to two.

5 typographic_settings.tex — Typographic finetuning

The settings of file `template/typographic_settings.tex` contain typographic finetuning related to things mentioned in literature. The settings in this file relates to personal taste and most of all: *typographic experience*.

What should I do with this file? You might as well skip the whole file by excluding the `\input{template/typographic_settings.tex}` command in `main.tex`. For standard usage it is recommended to stay with the default settings.

Some basic microtypographic settings are provided by the `microtype` package²¹. This template uses the rather conservative package parameters: `protrusion=true, factor=900`.

5.1 French spacing

Why? see Bringhurst (1993, p. 28, p. 30): ‘2.1.4 Use a single word space between sentences.’

How? see Eijkhout (2008, p. 185):

```
\frenchspacing %% Macro to switch off extra space after punctuation.
```

Note: This setting might be default for KOMA script.

5.2 Font

This template is using the Palatino font (package `mathpazo`) which results in a legible document and matching mathematical fonts for printout.

It is highly recommended that you either stick to the Palatino font or use the L^AT_EX default fonts (by removing the package `mathpazo`).

Choosing different fonts is not an easy task. Please leave this to people with good knowledge on this subject.

One valid reason to change the default fonts is when your document is mainly read on a computer screen. In this case it is recommended to switch to a font which is sans-serif like this. This template contains several alternative font packages which can be activated in this file.

²¹<http://ctan.org/pkg/microtype>

5.3 Text figures

...also called old style numbers such as 0123456789. (German: “Mediävalziffern”²²)

Why? see Bringhurst (1993, p. 44f):

‘3.2.1 If the font includes both text figures and titling figures, use titling figures only with full caps, and text figures in all other circumstances.’

How? Quoted from Wikibooks²³:

Some fonts do not have text figures built in; the `textcomp` package attempts to remedy this by effectively generating text figures from the currently-selected font. Put `\usepackage{textcomp}` in your preamble. `textcomp` also allows you to use decimal points, properly formatted dollar signs, etc. within `\oldstylenums{}`.

...but proposed L^AT_EX method does not work out well. Instead use: `\usepackage{hfoldsty}` (enables text figures using additional font) or `\usepackage[sc,osf]{mathpazo}` (switches to Palatino font with small caps and old style figures enabled).

5.4 `myacro` — Abbreviations using small caps



Why? see Bringhurst (1993, p. 45f): ‘3.2.2 For abbreviations and acronyms in the midst of normal text, use spaced small caps.’

How? Using the predefined macro `\myacro{}` for things like UNO or UNESCO using `\myacro{UNO}` or `\myacro{UNESCO}`.

²²https://secure.wikimedia.org/wikibooks/de/wiki/LaTeX-W%C3%B6rterbuch:_Medi%C3%A4valziffern

²³https://secure.wikimedia.org/wikibooks/en/wiki/LaTeX/Formatting#Text_figures_.28.22old_style.22_numerals.29

5.5 Colorized headings and links

This document template is able to generate an output that uses colorized headings, captions, page numbers, and links. The color named ‘DispositionColor’ used in this document is defined near the definition of package color in the preamble (see section 3.5). The changes required for headings, page numbers, and captions are defined here.

Settings for colored links are handled by the definitions of the hyperref package (see section 6).

5.6 No figures or tables below footnotes

L^AT_EX places floating environments below footnotes if b (bottom) is used as (default) placement algorithm. This is certainly not appealing for most people and is deactivated in this template by using the package footmisc with its option bottom.

5.7 Spacings of list environments

By default, L^AT_EX is using vertical spaces between items of enumerate, itemize and description environments. This is fine for multi-line items. Many times, the user does just write single-line items where the larger vertical space is inappropriate. The `enumitem` package provides replacements for the pre-defined list environments and offers many options to modify their appearances. This template is using the package option for `noitemsep` which minimizes the vertical space between list items.

5.8 csquotes — Correct quotation marks



Never use quotation marks found on your keyboard. They end up in strange characters or false looking quotation marks.

In L^AT_EX you are able to use typographically correct quotation marks. The package `csquotes` offers you with `\enquote{foobar}` a command to get

correct quotation marks around “foobar”. Please do check the package options in order to modify its settings according to the language used²⁴.

`csquotes` is also recommended by biblatex (see Section ??).

5.9 Line spread

If you have to enlarge the distance between two lines of text, you can increase it using the `linespread` option in `main.tex`. By default, it is deactivated (set to 100 percent). Modify only with caution since it influences the page layout and could lead to ugly looking documents.

5.10 Optional: Lines above and below the chapter head

This is not quite something typographic but rather a matter of taste. KOMA Script offers [a method to add lines above and below chapter head](#) which is disabled by default. If you want to enable this feature, remove corresponding comment characters from the settings.

5.11 Optional: Chapter thumbs

This is not quite something typographic but rather a matter of taste. KOMA Script offers [a method to add chapter thumbs](#) (in combination with the package `scrpage2`) which is disabled by default. If you want to enable this feature, remove corresponding comment characters from the settings.

6 pdf_settings.tex — Settings related to PDF output

The file `template/pdf_settings.tex` basically contains the definitions for the [hyperref package](#) including the [graphicx package](#). Since these settings should be the last things of any L^AT_EX preamble, they got their own T_EX file which is included in `main.tex`.

²⁴most of the time in combination with the language set in the options of the `babel` package

What should I do with this file? The settings in this file are important for PDF output and including graphics. Do not exclude the related input command in `main.tex`. But you might want to modify some settings after you read the [documentation of the hyperref package](#).

References

- Bringhurst, Robert (1993). *The Elements of Typographic Style*. first edition (cit. on pp. [11](#), [12](#), [16](#), [17](#)).
- Eijkhout, Victor (May 2008). *T_EX by Topic, a T_EXnician's Reference*. document revision 1.2. URL: <http://www.eijkhout.net/texbytopic/texbytopic.html> (cit. on pp. [11](#), [12](#), [16](#)).