

Writing a Master's Thesis in LaTeX

Manual of the document class kulemt v2.1.0

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Preface

I would like to thank everybody who has kept me busy with writing, debugging, and documenting this LaTeX document class. My thanks goes especially to my supervisor and my assistant-supervisors. I also thank my assessors, at least those who read this text.

Finally I would like to thank all the people who provided feedback, either with bug reports or by suggesting improvements.

Luc Van Eycken

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Abstract

This document describes the use of the LaTeX document class kulemt, which implements the KU Leuven Faculty of Engineering Science guidelines for writing a master's thesis. Since there are slight differences between the actual guidelines of the different engineering master's programmes, this class implements not only the common part, but it also provides the necessary options to adapt it to the specific requirements. So please check the guidelines of your master's programme before using or tweaking typesetting options.

To illustrate the difference between the main text language and the master's programme language, this document is written in English (as the main text language) for a Dutch master's programme.

This manual (dated 2025-05-03) describes the kulemt class version 2.1.0.



Samenvatting

Dit document beschrijft de LaTeX-documentklas kulemt, die de richtlijnen van de Faculteit Ingenieurswetenschappen van de KU Leuven voor het schrijven van een masterproeftekst implementeert. Maar vermits de richtlijnen van de verschillende ingenieursopleidingen licht verschillen, voorziet de documentklas de nodige opties om het resultaat aan te passen. Hou dus bij het aanmaken van de tekst niet zozeer rekening met wat de documentklas toelaat, maar wel met wat jouw master als specifieke richtlijnen opgeeft.

Voor studenten van een Nederlandstalige master die hun masterproef in het Engels schrijven (bv. Erasmus-studenten) is een Nederlandse samenvatting verplicht. Als jouw master een uitgebreide samenvatting verlangt met figuren en tabellen kun je die best voorzien als een bijlage. Anders volstaat deze samenvatting van 1 bladzijde.

Om het effect van twee talen te illustreren is dit document geschreven als een Engelse tekst (verder ‘text language’ genoemd) voor een Nederlandstalige master (verder ‘master’s programme language’ genoemd).

Deze handleiding van 2025-05-03 beschrijft de LaTeX-documentklas kulemt versie 2.1.0.



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Writing a thesis in LaTeX

A LaTeX document class has been developed, which follows the guidelines described in [18]. The usage of this class is described in Chapter 2. Appendix B contains a typical LaTeX template. The result can be customised and adapted to the master's programme guidelines with the class options. Additional functionality is available through numerous LaTeX packages (cf. §1.1). Just make sure that the final result still conforms to the guidelines.

The following sections assume you already have a working LaTeX installation. If this is not the case on a Linux based distribution, first check the distribution documentation. Otherwise consult the TeX-FAQ [7] for installing a LaTeX distribution for your system.

If you are not (yet) familiar with LaTeX, you should first have a look at the documentation of the TeX Users Group [3]. It also contains a list of on-line tutorials and manuals. The most popular tutorial is probably *A Not So Short Introduction to L^AT_EX 2_ε* [13]. The next section contains some extra information on how to install LaTeX packages. It also lists some typically useful packages.

1.1 Using LaTeX packages

The document class kulemt uses some standard LaTeX packages (such as babel and graphicx) and is based on the document class memoir, so it also includes all packages included or emulated by memoir¹. The exact list of packages included or emulated in memoir can always be found in the log file after a LaTeX run. The emulation not always corresponds to the latest version of the package, but the main functionality is usually present. So before installing a new package, first check the memoir manual [21] to see if the functionality is not already present in the document class.

1.1.1 Installing a LaTeX package

Most of the packages listed below are included in a standard LaTeX installation, with the exception of the kulemt package. But in case you need to install a package yourself, you can follow the instructions found in the TeX-FAQ [7] under the heading 'Shortcuts to installing

¹ The memoir class includes or emulates since 2018-12-12 at least the packages abstract, appendix, array, booktabs, ccaption, changepage, chngcntr, chngpage, crop, dcolumn, delarray, enumerate, epigraph, ifmtarg, index, makeidx, moreverb, mparhack, needspace, newfile, nextpage, pagenote, parskip, patchcmd, setspace, shortvrb, showidx, tabularx, titleref, titling, tocbibind, tocloft, tocvsec2, verbatim, and verse.

TABLE 1.1: Packages which can be useful to extend the kulemt class.

Package	Description
hyperref	Provide hyperlinks in PDF files
microtype	Enhance the typographic quality of your text
amsmath	Extra mathematical constructs
amssymb	Extra mathematical symbols*
rotating	Rotating material, e.g., figures en tables
listings	Typeset programming code
nomencl	Produce lists of symbols (nomenclature)
tikz	Create graphics in LaTeX
siunitx	Consistent use of SI units
biblatex	Sophisticated bibliographies in LaTeX
cite	Better references (when using BibTeX)

* A list of all kind of symbols is found in *The Comprehensive L^AT_EX Symbol List* [14].

files’. If you only can or want to install packages for your personal use, make sure you also read ‘Private installations of files’.

The installation of the document class kulemt is done in the same way as the installation of any other package. The only difference is the fact that its source is currently not available from CTAN or a Linux distribution but from a local web server eng.kuleuven.be/docs/kulemt/latex.

1.1.2 Useful extra LaTeX packages

A lot of packages are available from CTAN [1], which can help you to make your text easier to understand or more impressive. Many of them are installed by default in a traditional LaTeX installation. Some typical examples are given in Table 1.1. The loading order can be important for some combination of packages: packages, which extend or redefine commands of other packages, must be loaded after those packages.

If you are making a PDF file for on-line distribution, the use of the hyperref package [15] is a must. It not only automatically generates the bookmarks, but it also gives you all the linking facilities required in modern on-line documents.

The microtype package [16] enhances the typographic quality of the text. The most important enhancements provided by the package are character protrusion and font expansion. Character protrusion lets some characters slightly enter the margin to provide optical margins. Font expansion creates fonts which are a little bit narrower or wider. It generates more equal interword spacing and it provides also more flexibility to avoid hyphenation. Both effects are illustrated in Figure 1.1. It works best with pdf_latex or lua_latex.

LaTeX is basically a document processing system for text. The easiest way to include graphics or diagrams, is to generate them with an external processor and then include them with `\includegraphics`². But external processors mostly use different fonts and

² This command is defined by the graphicx package, which is already preloaded by the kulemt class.

The theory which is sketched in the following pages forms the most wide-going generalization conceivable of what is at present known as the *theory of Relativity*; this latter theory I differentiate from the former *Special Relativity theory*, and suppose it to be known. The generalization of the Relativity theory has been made much easier through the form given to the special Relativity theory by Minkowski, which mathematician was the first to recognize clearly the formal equivalence of the space like and time-like co-ordinates, and who made use of it in the building up of the theory. The mathematical apparatus useful for the general relativity theory, lay already complete in the *Absolute Differential Calculus*, which were based on the researches of Gauss, Riemann and Christoffel on the non-Euclidean manifold, and which have been shaped into a system by Ricci and Levi-Civita, and already applied to the problems of theoretical physics. I have in part B of this communication developed in the simplest and clearest manner, all the supposed mathematical auxiliaries, not known to Physicists, which will be useful for our purpose, so that, a study of the mathematical literature is not necessary for an understanding of this paper. Finally in this place I thank my friend Grossmann, by whose help I was not only spared the study of the mathematical literature pertinent to this subject, but who also aided me in the researches on the field equations of gravitation.

(a) Text typeset without using microtype.

The theory which is sketched in the following pages forms the most wide-going generalization conceivable of what is at present known as the *theory of Relativity*; this latter theory I differentiate from the former *Special Relativity theory*, and suppose it to be known. The generalization of the Relativity theory has been made much easier through the form given to the special Relativity theory by Minkowski, which mathematician was the first to recognize clearly the formal equivalence of the space like and time-like co-ordinates, and who made use of it in the building up of the theory. The mathematical apparatus useful for the general relativity theory, lay already complete in the *Absolute Differential Calculus*, which were based on the researches of Gauss, Riemann and Christoffel on the non-Euclidean manifold, and which have been shaped into a system by Ricci and Levi-Civita, and already applied to the problems of theoretical physics. I have in part B of this communication developed in the simplest and clearest manner, all the supposed mathematical auxiliaries, not known to Physicists, which will be useful for our purpose, so that, a study of the mathematical literature is not necessary for an understanding of this paper. Finally in this place I thank my friend Grossmann, by whose help I was not only spared the study of the mathematical literature pertinent to this subject, but who also aided me in the researches on the field equations of gravitation.

(b) The same text typeset using microtype (character protrusion & font expansion).

FIGURE 1.1: The effect of using the microtype package. These examples are based on gist.github.com/AndiH/8b65adb77b00c4b970.

scaling, which clashes with the look of the rest of your document. An alternative is to use the `tikz` package [17] where drawing is done using TeX commands, such as in Figure 1.2. Its manual of more than 1300 pages shows how to generate graphics for different domains. Furthermore, CTAN holds more than 150 packages enhancing `tikz` or making use of it [2].

1.2 Selecting fonts

The thesis guidelines only give some general hints about fonts, but they don't enforce specific fonts, except for the title page and the cover page. Not only a text font must be selected but also a matching math font. Even if you don't use formulas or equations, a math font is often needed for subscripts or superscripts.

Two types of font formats can be used: the older Type1 format and the modern OpenType format (OTF or TTF). Modern operating system fonts, such as Cambria on Windows (or the free compatible Caladea) or Geneva on MacOS, are usually only available in the OpenType format. Both font formats can be used by `lualatex` and `xelatex` while `pdflatex` can only use Type1 fonts. A list of available fonts in a standard LaTeX system can be found in *The L^AT_EX Font Catalogue* [6].

You can select your own combination of fonts using standard LaTeX packages. If no fonts are defined, the default LaTeX fonts (Latin Modern) are used as body fonts. Recent packages are aware of the LaTeX engine you use and automatically switch between the font formats. Often they also provide suitable math fonts. Some examples are: `erewhon` (Utopia based), `libertinus` (used in this manual), `newpx` (Palatino based), `newtx` (Times based), and `XCharter` (Charter based). The wrapper-type package `fontsetup` may simplify choosing between OpenType fonts with math counterparts. For more information, have a look at the documentation of these packages on CTAN [1] or via `texdoc` [5]. An almost complete overview of all possibilities is described in a recent *The L^AT_EX Companion* [12].

No font contains all Unicode characters. LaTeX signals missing characters either as an “inputenc Error” or as a “Missing character” warning. So, if you want to avoid missing characters, you have to carefully check the `.log` file or the output on the terminal³.

1.3 Adding a bibliography

The bibliography can be input as a list in the text, using the `thebibliography` environment. A better way to generate a bibliography is with the help of the BibTeX programme [11] or the Biber programme [8]. The latter requires the use of the `biblatex` package [9]. The bibliographic data is stored in one or more bibliographic files (files with extension `.bib`). Apart from a personal data file, existing data files can be used for some disciplines. For more information, please consult the website *Learn LaTeX* [4, lesson 12 (Citations and references)]. It will also help you choose between the BibTeX workflow and `biblatex`.

The master's programme guidelines or the thesis supervisor determine which bibliography style to use. If none is specified, you can choose whichever you find most suited for your text.

³ If you set `\tracinglostchars` to 3 in the preamble, an error is issued instead of a warning. At least if you have a post-2021 LaTeX.

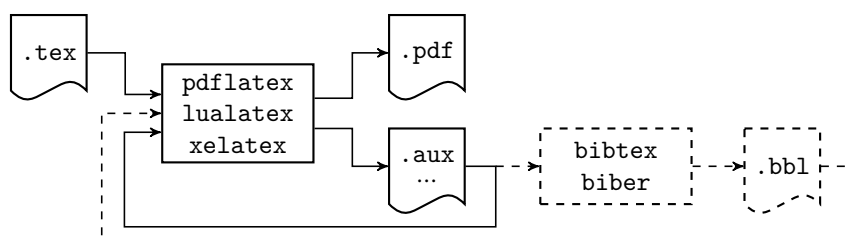


FIGURE 1.2: Steps to compile a LaTeX file. The dashed part is needed only if a bibliography is used. As long as the .bbl file or internal files (.aux, .toc, .lof, .lot, ...) change, (pdf/lua/xelatex) must be invoked again. If you use an intelligent editor, it will tell you when an extra iteration is needed.

1.4 Using latex, pdflatex, lualatex or xelatex?

The traditional way to compile a LaTeX file uses the `latex` programme. It outputs the typeset document to a `.dvi` file, which is rather TeX specific. So usually this is converted to a PostScript file using `dvips` or a PDF file using `dvips + dvi2pdf`. However, since every master's thesis must also be submitted electronically in PDF format, there is no reason to take the PostScript route unless your text depends on packages which work only with PostScript output, such as `psfrag` or all kind of PSTricks packages. But often valid or even better replacements exist, such as the `tikz` package [17]. Conversion tools may also be available (e.g., the `pst-pdf` package).

If you want a PDF file as a result, it's easier to use `pdflatex`, as illustrated in Figure 1.2. But `pdflatex` has other advantages too. It uses the pdfTeX engine, which is an enhanced implementation of the TeX engine used by `latex`. Therefore more advanced features, such as breaking hyperlinks (`hyperref` package) or font expansion (`microtype` package), are only possible with the pdfTeX engine. Additionally, the pdfTeX engine can directly include images in the JPEG or PNG file format as well as other PDF files. Simple PostScript (e.g., as generated by MetaPost) can also be included but general EPS (Encapsulated Postscript) not. You'll have to convert the latter to PDF with the `epstopdf` programme.

A modern installation also provides the `xelatex` and `lualatex` programmes, based respectively on the XeTeX and the LuaTeX engine. The XeTeX engine is derived from the TeX engine and supports almost any system font (cf. §1.2). The LuaTeX engine is a greatly extended version of pdfTeX using Lua as an embedded scripting language. Some packages use the Lua interpreter to perform more complex computations than any other TeX based engine can do. It also enables `lualatex` to use modern fonts (cf. §1.2).

When you use a LaTeX-oriented editor or online software, such as Overleaf, selecting the engines or the programmes to run, can be changed in the settings.

A final word of advice: to avoid errors and text drifting to other places, don't switch between engines gratuitously.

The LaTeX document class kulemt

The document class `kulemt` can be used to generate a master's thesis text that conforms to the guidelines of the KU Leuven Faculty of Engineering Science.

The document class `kulemt` is actually an extension of the `memoir` document class [22], which already includes the functionality of the most useful LaTeX packages. So, before adding or changing some functionality, you should check the `memoir` manual [21] first.

The default styling of the chapter and section headings is pretty plain. Of course you can tweak all parameters yourself, but the `memoir` class provides consistent alternatives using the `\headstyles` command [21, section 6.9]. For changing only the chapter heading style, the `\chapterstyle` command [21, section 6.5] is available. The chapter and headings style used by this document are available in the `kulemtx` package, which is part of the `kulemt` bundle. More examples of chapter styles are available from [10].

2.1 Requirements

New in v2.0

A LaTeX dated 2018-04-06 with a L3 programming layer dated 2019-04-06 is a minimal requirement. This L3 programming layer contains important improvements, such as UTF-8 as the default input encoding (needed for LuaLaTeX and XeLaTeX) and the introduction of a rollback concept. Version 2 of the `kulemt` class has been reimplemented completely using the new programming layer. In case you still need version 1, you can roll back to the version of 2024-12-16 by starting the preamble with the following line.

```
\documentclass[<version 1 class options>]{kulemt}[=v1]
```

New in v2.1

The document class `kulemt` is based on the `memoir` document class. The minimal version of `memoir` is probably 3.7h (dated 2018-12-12), since it has been tested with this version (and some newer ones). The font `TeX Gyre Heros` is used for the front pages, so it must be installed, as well as the `fontspec` package for Unicode engines.

The default LaTeX input text encoding is UTF-8, which supports all characters. Furthermore Unicode engines (LuaTeX and XeTeX) only support UTF-8. In case you use another encoding with pdfTeX, you have to include

```
\usepackage[<encoding name>]{inputenc}
```

at the beginning of the preamble.

2.2 The configuration file

The configuration file contains all information about the masters, their options and layout features. By keeping this information separated from the document class code, it can easily be updated yearly by somebody without LaTeX coding experience.

The syntax of the configuration file is described in [20, III.1 Format of the configuration file]. As a student, you cannot change this file unless told so by the master's thesis coordinator of your programme or of the Faculty.

New in v2.0

The default configuration file is `kulemt.ini`. It is not compatible with the version 1 file `kulemt.cfg`. A master specific configuration file can also no longer be used.

2.3 Options

The document class can be customised by the user through options. The options come in two flavours. A first set of options, called *document class options*, can only be used as options of the `\documentclass` command. The reason for having document class options is that an option is needed as a global option, which can also be used by other packages, or that an option is used during the initialisation of the class itself. The other options, called *unrestricted options*, can be used everywhere in the document preamble, either as option of `\documentclass` or as an argument of a `\setup` command.

Many options are specified as “`\langle key \rangle = \langle value \rangle`”. If the value contains a comma or a space, it must be enclosed in braces: “`\langle key \rangle = { \langle value \rangle }`”. Due to the implementation of LaTeX, options of the `\documentclass` cannot contain commands or spaces, contrary to the argument of `\setup`. Therefore it's better to put all options, except the document class options, in the argument of one or more `\setup` commands. The document preamble can contain multiple `\setup{ \langle optionlist \rangle }` commands. The `\langle optionlist \rangle` is a comma separated list of options.

Options are processed in the order of appearance. This implies that if options are given multiple times, the last value survives. However *list options* do not overwrite a previous value but they accumulate values of that option.

Most of the options are optional, except for the *required* options. However, when the option `article` is used, all of these options are optional too.

2.3.1 Choosing the basic layout

New in v2.0

The thesis layout is the standard layout and is adopted by default. The article layout is the second layout and is selected with the `article` option. The article layout can be used to typeset additional articles which may be required by your master's programme.

OPTION “`article`”

(*document class option*)

This option switches from the thesis layout to the article layout, as provided by the memoir class.

New in v2.0

In the article layout, no cover page or front pages are generated, all other options are optional and an additional option `twocolumn` is available. That additional option can only be used after the `article` option.

2.3.2 Selecting the master's programme

OPTION “master=<id>” *(required document class option)*

The supported master's programme <id>s are defined in the configuration file. The currently supported <id>s for the Faculty of Engineering Science are listed in §A.1. The master option is used to indicate the master's degree this thesis is written for. Only one master option can be given in the document, which makes it impossible to generate one text for different master's degrees, even if it is a common work of two or more students from different master's programmes. This scenario was considered too unlikely to support, also because each master's programme may have its own additional requirements on content and layout.

Obsolete <id> definitions may still be available for printing older material. See §A.1.4 for available obsolete <id>s. Note that an <id> may change when it becomes obsolete to avoid conflicts with valid <id>s.

OPTION “masteroption=<mo>” *(unrestricted list option)*

This option specifies the option ('optie') or the major topic ('afstudeerrichting') of the master's degree. The value <mo> is either an abbreviation or a text describing the master's programme option. The known master's programme option abbreviations are defined in the configuration file. The currently supported option abbreviations for the Faculty of Engineering Science are enumerated in §A.1. If a text is used for <mo>, it must start with the appropriate word in lower case: “option ...” (“optie ...” or “afstudeerrichting ...” in Dutch). Examples of full text can be found in §A.1. As mentioned above, if <mo> contains spaces, you cannot use this as a document class option.

Whether or not a master's programme option must be specified depends on your master's programme guidelines. Some master's programmes even do not allow you to print an option on the title page. You can find all this information in §A.1.

An error is raised if the master's programme requires you to specify an option and masteroption is not used. An error is also raised if you use masteroption and your master's programme disallows options.

If students from different master's programme options together produce a single text, masteroption can be used multiple times and the different <mo>s are accumulated.

Obsolete master's programme options may still be available for printing older material. Available obsolete options are listed in §A.1. Note that abbreviations may change when they become obsolete to avoid conflicts with valid options.

2.3.3 Declaring the language(s)

The commands of the babel package can be used to select a language. Currently only Dutch and English are supported as text language, but other languages can be used for short fragments of text. Additionally British is available, since this is the English variant recommended by the KU Leuven. The master's programme language is defined by the master's degree itself, so it cannot be chosen.

Some engines, such as pdfTeX and XeTeX, use preloaded hyphenation patterns. For these engines TeX will raise an error if the Dutch hyphenation patterns are not preloaded

in your TeX installation and you use the option `dutch` or the master's programme language is Dutch. In that case you have to update your installation.

OPTIONS “`dutch`”, “`english`” or “`british`” *(document class option)*

These options select the text language, either English (or its variant British) or Dutch. The options are mutually exclusive: at most one of the options can be used. If none of the options is used, the text language is set to the master's programme language, defaulting to English if no `master` option is given.

Since these options are document class options, they are global LaTeX options. This means that other packages which are language sensitive will also use these options.

OPTION “`extralanguage=<lang>`” *(document class list option)*

To switch the language of text fragments, commands such as `\foreignlanguage` are available from the `babel` package. In older versions of `babel` (before version 3.39 dated 2020-02-03) these languages must have been defined before they can be used. By default only the text language and the master's programme language are defined. If other languages are needed with the older versions of `babel`, they must be declared with this `extralanguage` option. The `<lang>` can be any language known to `babel`, but keep in mind that `babel` cannot handle dialects of a previously defined language. If multiple languages must be declared, you have to use this option several times.

With recent versions of `babel` the `extralanguage` option becomes obsolete.

2.3.4 Information for the title page

These options provide the necessary information for the title page. Since this page must be present in the thesis, most of the options are required.

Due to implementation restrictions, math is not supported on the front pages (although it may work for some fonts). Since you cannot use math in the metadata you have to submit with the PDF file, try to avoid math in the next options anyway.

OPTION “`title=<title>`” *(required unrestricted option)*

This option provides the official title `<title>` of the thesis. It must be written in the text language, which may be different from the master's programme language.

OPTION “`subtitle=<stitle>`” *(unrestricted option)*

A subtitle `<stitle>` is optional. It is only used on the title page. It will not be used in any bibliographic reference.

OPTION “`author=<authors>`” *(required unrestricted option)*

This option provides the name `<authors>` of the author(s) of the thesis. The name consists of a non-abbreviated first name followed by the last name without a comma in between. If the thesis text has multiple authors, they are all listed in `<authors>`, separated by the command `\and`.

OPTION “`promoter=<promoters>`” *(required unrestricted option)*

This option lists the `<promoters>` (a.k.a. thesis supervisors). If the thesis has multiple supervisors and/or co-supervisors, they are all listed in `<promoters>`, separated by the command `\and`. The names of the supervisors are preceded by their title unless stated otherwise in the master's programme guidelines.

The $\langle promoters \rangle$ value also lists the co-supervisors. Co-supervisors are always given after the supervisor(s). Nothing is provided to differentiate between supervisors and co-supervisors. However your master's programme may have additional guidelines about this.

OPTION "promotor= $\langle promoters \rangle$ "

This option is an alias for the option promoter.

OPTION "assessor= $\langle assessors \rangle$ " *(required unrestricted option)*

This option lists the $\langle assessors \rangle$ of the thesis separated by the command \and. The names of the assessor are preceded by their title unless stated otherwise in the master's programme guidelines. For assessors from other universities or companies, their affiliation can be mentioned if the master's programme guidelines require it.

If you do not have any assessor, contrary to the faculty rules, you must use this required option but with an empty value for $\langle assessors \rangle$, e.g., use "assessor=" as an option.

OPTION "assistant= $\langle assistants \rangle$ " *(required unrestricted option)*

This option lists the $\langle assistants \rangle$ (a.k.a. assistant-supervisors) of the thesis separated by the command \and. For assistants from other universities or companies, their affiliation can be mentioned if the master's programme guidelines require it.

If you worked without the help of an assistant, you can use this required option with an empty value for $\langle assistants \rangle$, e.g., use "assistant=" as an option.

OPTION "acyear= $\langle acyear \rangle$ " *(unrestricted option)*

This option sets the (starting year of the) academic year the master's degree is obtained. Since version 2, the value $\langle acyear \rangle$ is a 4-digit number.

The default is the current academic year. If run after 1 October, the current year defines the start of the academic year. Otherwise it defines the end of the academic year. So this option should probably only be used in case of emergency because the default works quite well.

New in v2.0

2.3.5 Conditionally generating pages

The options in this section determine which pages are available in the output file.

OPTION "coverpageonly" *(unrestricted option)*

If this option is used, only the title page (which can be used as a cover page) is printed.

This option supersedes any other option from this section.

OPTION "frontpagesonly" *(unrestricted option)*

If this option is used, only the front pages (the title page and the copyright page) are printed instead of the entire document. You can use this option to generate these pages when you are using other text processing software to write your thesis.

2.3.6 The layout of the typeblock

These options customise the layout of the text area on the page. Most of them are options available to all traditional LaTeX document classes.

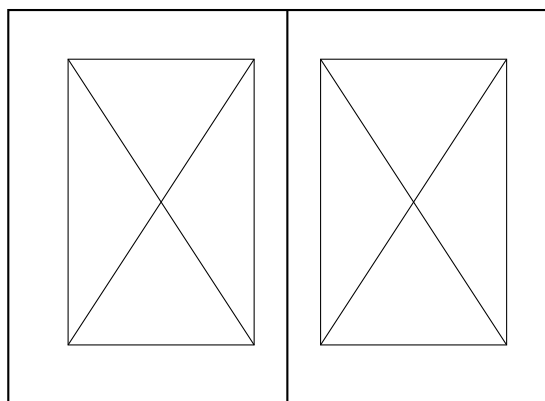


FIGURE 2.1: In a spread, showing a left verso and a right recto page, the combination of the two inner margins is perceived as a single margin. Therefore the width of an outer margin is comparable to two times the width of an inner margin.

OPTIONS “10pt” or “11pt” *(document class option)*

The default font size of the main text can be set to 10 pt or 11 pt. The options are mutually exclusive. The default size is 11 pt.

All other fonts used in the text are scaled proportionally. Additionally the line width of a 10 pt text is decreased by 1 cm because of readability reasons.

OPTIONS “oneside”, “twoside” or “twosidelrequal” *(document class option)*

These mutually exclusive options declare where the typeblock will be located and whether the document will be printed on both sides of the paper or only on one side. The default value is `twosidelrequal`, so you only need it to cancel a previous option `oneside` or `twoside`.

The `twoside` option indicates that the text will be printed on both sides of the paper. By default, each main chapter starts on a recto page (the right-hand page of the printed book). To get a more pleasing look, the inner margins (right on verso, left on recto) are smaller than the outer margins, as shown on Figure 2.1.

The `oneside` option indicates that it either will be printed on one side or it will be available for on-screen viewing only. Contrary to printed books, electronic versions are usually read from the screen, one page at a time. In the latter case it makes more sense to have equal left and right margins and to avoid empty pages between chapters. The latter can be obtained by allowing chapters to begin on any page, not only on odd numbered pages.

New in v2.0

If your thesis will primarily be distributed for on-screen viewing, but it should also look nice when printed, you can use the option `twosidelrequal`. This is equivalent to the `twoside` option, but with equal inner and outer margins. This way the typeblock does not jump from left to right when you page on-screen through the thesis.

The `kulemt` document class has been designed to guarantee that the size of the typeblock does not change when you switch between the options, only its horizontal

position. This means that you can without problems use the `twoside` option to generate the high quality printed version and the `twosidelrequal` option for the PDF version.

New in v2.0

To keep life easy, `twosidelrequal` is the new default since version 2. To revert to the default of version 1, you must explicitly use the `twoside` option.

OPTIONS “`openright`”, “`openleft`” or “`openany`” *(document class option)*

These options determine the page on which a new chapter in the main matter starts.

- `openright`: Each main matter chapter starts on a recto page. This is customary in printing.
- `openleft`: Each main matter chapter starts on a verso page. Only use this if your supervisor demands it.
- `openany`: A main matter chapter can start on any page. You can use this to remove empty pages between chapters.

The three options are mutually exclusive. The default value is `openright`. For one-side printing only recto pages are used, so these options are irrelevant.

The memoir class also provides the `\openright`, `\openleft`, and `\openany` commands to change this inside the document itself.

OPTION “`bind=<binding length>`” *(document class option)*

When you open a two-side printed book, some paper of the inner margins is invisible due to the binding of the book. It seems as if the inner margins are smaller than specified. This option specifies the amount *<binding length>* of the invisible inner margin of a page. This amount is specified as a length (e.g., 3mm) and it defaults to 0 mm.

2.3.7 Other options

New in v2.0

OPTION “`cfgfile=<file>`” *(document class option)*

This option lets you use another configuration file *<file>* instead of the standard file `kulemt.ini`.

OPTION “`draft`” *(document class option)*

The `draft` option is a global option which influences many packages. The main effect is to mark overfull lines and to not show graphics content.

OPTION “`fleqn`” *(document class option)*

By default displayed math equations are centred. Using this option puts all displayed equations at the left margin, indented by an amount of `\mathindent`.

OPTION “`oldfontcommands`” *(document class option)*

The `oldfontcommands` option is passed to memoir to make the old, deprecated LaTeX version 2.09 font commands available. Please use this only to solve problems with old packages you are forced to use.

2.3.8 Options removed in version 2

New in v2.0

The following version 1 options are no longer available. Using them results in errors.

- The option `font` has been removed. If you prefer other fonts than the default ones, you have to load the appropriate packages yourself (cf. §1.2).
- The option `inputenc` has been removed. If you insist on using an encoding different from UTF-8 with pdfTeX, you have to load the `inputenc` package yourself (cf. §2.1).
- Since a filing card is no longer provided, the option `filingcard` is removed as well as all options providing additional information for the filing card: `translatedtitle`, `shortabstract`, `udc`, `keywords`, and `articletitle`.
- The package `microtype` is no longer loaded automatically by the `kulemt` class, so the option `nomicrotype` becomes irrelevant and is removed.
- The option `bindcover` has already been obsolete since version 1.7, so it is removed.

2.4 Additional commands and environments

The (extensive) basic functionality of the `memoir` class, complemented by existing LaTeX packages, provides most of the commands to write a master's thesis according to the guidelines. This section describes the additional commands and environments defined by the `kulemt` class to extend the user capabilities.

One of the new commands is `\setup{<optionlist>}`. It is used to set options with values which contain other commands. This command is described on page 7.

2.4.1 The preface environment

The preface environment contains the preface text to be typeset on the preface page.

The environment has one optional argument, which holds the preface author. It defaults to the value of the `author` option (cf. page 9). This argument is typeset at the right margin in italics after the preface text. The argument can be used to remove the preface author (by providing an empty argument) or to add information such as a date to it. Just try out the following example right after `\begin{document}`:

```
\begin{preface}[The Author\\ \textup{1 January 2010}]
  The text of the preface. A few paragraphs should follow.
\end{preface}
```

2.4.2 The abstract* environment

The existing `abstract` environment typesets an abstract page in the text language. An additional `abstract*` environment is defined to typeset an additional abstract page in another language. The language of the `abstract*` environment is given in the optional argument. It defaults to the official master's programme language. It is typically used to add an additional abstract page if the thesis is written in a language different from the master's programme language.

2.4.3 The `\listoffiguresandtables` command

Normally all “List of...” overviews are printed on a separate page. However, for shorter texts like a master’s thesis these lists may be smaller than half a page. Therefore an additional command `\listoffiguresandtables` is provided, which combines the list of figures and tables without a page break.

The list of figures and tables are put in separate sections of one chapter, first the figures then the tables. The command `\listfiguresandtablesname` holds the title of the chapter.

Appendices

Information about the master's programmes

This appendix gives an overview of the master's programmes of the Faculty of Engineering Science. These master's programmes are supported by default by the LaTeX document class `kulemt`. But all of this information is also valid for non-LaTeX documents.

A.1 Information from `kulemt.ini`

The master's programme specific information is stored in the `kulemt.ini` file. It contains information about the master's programme language, the programme's faculty, known master's programme options, and copyright contact information.

This section describes the `kulemt.ini` file dated 17 February 2025. For the latest information, consult `kulemt.ini` directly. If no faculty name is shown, it is an inter-faculty programme.

A.1.1 Dutch initial master's programmes

- arc** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: ARCHITECTUUR
 Dutch master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
 The master's programme doesn't allow you to mention an option.
- ai** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: ARTIFICIËLE INTELLIGENTIE
 Dutch master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
 The master's programme doesn't require you to mention an option.
- bin** MASTER OF SCIENCE IN DE BIO-INFORMATICA
 Dutch master.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
 The master's programme doesn't require you to mention an option.

- bmt** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: BIOMEDISCHE TECHNOLOGIE
Dutch master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
- bwk** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: BOUWKUNDE
Dutch master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
– gt ("optie Gebouwentechiek")
– si ("optie Structurele ingenieurskunde")
– wb ("optie Waterbouwkunde")
obsolete: – ct.2022 ("optie Civiele techniek")
- cit** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: CHEMISCHE TECHNOLOGIE
Dutch master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
– cbpe ("optie Chemische en biochemische proces engineering")
– me ("optie Milieu engineering")
– pe ("optie Product engineering")
- cws** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: COMPUTERWETENSCHAPPEN
Dutch master of the Faculty of Engineering Science.
Contact info: Department of Computer Science, Celestijnenlaan 200A bus 2402, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
– ai ("hoofdoptie Artificiële intelligentie")
– ci ("hoofdoptie Computatieve informatica")
– gs ("hoofdoptie Gedistribueerde systemen")
– mmc ("hoofdoptie Mens-machinecommunicatie")
– se ("hoofdoptie Software engineering")
– vs ("hoofdoptie Veilige software")

- elt** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: ELEKTROTECHNIEK
Dutch master of the Faculty of Engineering Science.
Contact info: Department of Electrical Engineering, Kasteelpark Arenberg 10 bus 2440, B-3001 Leuven
A master's programme option must be specified.
Known master's programme option abbreviations:
– ea ("optie Energiesystemen en automatisatie")
– ec ("optie Elektronica en chipontwerp")
– in ("optie ICT-beveiliging en netwerken")
– is ("optie Informatiesystemen en signaalverwerking")
obsolete: – eg.2020 ("optie Elektronica en geïntegreerde schakelingen")
– im.2020 ("optie Ingebedde systemen en multimedia")
- ene** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: ENERGIE
Dutch master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
The master's programme doesn't allow you to mention an option.
- msc** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: MOBILITEIT EN SUPPLY CHAIN
Dutch master of the Faculty of Engineering Science.
Contact info: Centre for Industrial Management, Celestijnenlaan 300A bus 2422, B-3001 Leuven
The master's programme doesn't require you to mention an option.
- mtk** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: MATERIAALKUNDE
Dutch master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
– bm ("optie Biomaterialen")
– mk ("optie Metalen en keramieken")
– nm ("optie Nanomaterialen")
– pc ("optie Polymeren en composieten")
- nan** MASTER OF SCIENCE IN DE NANOWETENSCHAPPEN, NANOTECHNOLOGIE EN NANO-ENGINEERING
Dutch master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001

Leuven

The master's programme doesn't require you to mention an option.

Known master's programme option abbreviations:

- nb ("optie Nanobiotechnologie")
- nc ("optie Nanocomponenten en circuits")
- nf ("optie Nanofysica engineering")
- nm ("optie Nanomaterialen en nanochemie")
- qe ("optie Quantum engineering, materialen en technologie")
- obsolete: - nc.2023 ("optie Nanocomponenten en nanofysica")
- ne.2023 ("optie Nano-elektronicaontwerp")

sta MASTER OF SCIENCE IN DE STATISTIEK

Dutch master.

Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001

Leuven

The master's programme doesn't require you to mention an option.

Known master's programme option abbreviations:

- asm ("profiel Algemene statistische methodologie")
- bm ("profiel Biometrie")
- bs ("profiel Business statistiek")
- is ("profiel Industriële statistiek")
- sgp ("profiel Statistiek in de sociale, gedrags- en pedagogische wetenschappen")
- obsolete: - so.2020 ("profiel Statistiek en onderwijs")

wit MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: WISKUNDIGE INGENIEURSTECH-
NIEKEN

Dutch master of the Faculty of Engineering Science.

Contact info: Department of Computer Science, Celestijnenlaan 200A bus 2402, B-3001

Leuven

The master's programme doesn't require you to mention an option.

wtk MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: WERKTUIGKUNDE

Dutch master of the Faculty of Engineering Science.

Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001

Leuven

The master's programme doesn't allow you to mention an option.

A.1.2 English initial master's programmes

ebin MASTER OF SCIENCE IN BIOINFORMATICS

English master.

Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001

Leuven

The master's programme doesn't require you to mention an option.

- ebmt** MASTER OF SCIENCE IN BIOMEDICAL ENGINEERING
English master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
- bda ("option Biomedical Data Analysis")
 - be ("option Bio-Electronics")
 - biai ("option Bio-Informatics and AI")
 - bm ("option Biomechanics")
 - mp ("option Medical Physics")
 - te ("option Tissue Engineering")
- ebwk** MASTER OF SCIENCE IN CIVIL ENGINEERING
English master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
- he ("option Hydraulic Engineering")
 - se ("option Structural Engineering")
- ecit** MASTER OF SCIENCE IN CHEMICAL ENGINEERING
English master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
- cbpe ("option Chemical and Biochemical Process Engineering")
 - me ("option Environmental Engineering")
 - pe ("option Product Engineering")
- ecws** MASTER OF SCIENCE IN ENGINEERING: COMPUTER SCIENCE
English master of the Faculty of Engineering Science.
Contact info: Department of Computer Science, Celestijnenlaan 200A bus 2402, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
- ai ("option Artificial Intelligence")
 - ss ("option Secure Software")

- eelt** MASTER OF SCIENCE IN ELECTRICAL ENGINEERING
 English master of the Faculty of Engineering Science.
 Contact info: Department of Electrical Engineering, Kasteelpark Arenberg 10 bus 2440, B-3001 Leuven
 A master's programme option must be specified.
 Known master's programme option abbreviations:
- ec ("option Electronics and Chip Design")
 - in ("option ICT Security and Networks")
 - is ("option Information Systems and Signal Processing")
 - pa ("option Power Systems and Automation")
- obsolete:
- ei.2020 ("option Electronics and Integrated Circuits")
 - em.2020 ("option Embedded Systems and Multimedia")
- eene** MASTER OF SCIENCE IN ENGINEERING: ENERGY
 English master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
 The master's programme doesn't allow you to mention an option.
- ekene** EIT-KIC MASTER OF SCIENCE IN ENERGY
 English master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
 The master's programme doesn't allow you to mention an option.
- emsc** MASTER OF SCIENCE IN MOBILITY AND SUPPLY CHAIN ENGINEERING
 English master of the Faculty of Engineering Science.
 Contact info: Centre for Industrial Management, Celestijnenlaan 300A bus 2422, B-3001 Leuven
 The master's programme doesn't require you to mention an option.
- emtk** MASTER OF SCIENCE IN MATERIALS ENGINEERING
 English master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven
 The master's programme doesn't require you to mention an option.
 Known master's programme option abbreviations:
- bm ("option Biomaterials")
 - mc ("option Metals and Ceramics")
 - nm ("option Nanomaterials")
 - pc ("option Polymers and Composites")

- ekmsm** EIT-KIC MASTER OF SCIENCE IN SUSTAINABLE MATERIALS
 English master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
 Leuven
 The master's programme doesn't require you to mention an option.
 Known master's programme option abbreviations:
- ma ("option Sustainable Materials")
 - me ("option Sustainable Metallurgy")
 - md ("option Materials Development")
- enan** MASTER OF SCIENCE IN NANOSCIENCE, NANOTECHNOLOGY AND NANOENGINEERING
 English master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
 Leuven
 The master's programme doesn't require you to mention an option.
 Known master's programme option abbreviations:
- nb ("option Nanobiotechnology")
 - nc ("option Nanodevices and Circuits")
 - nm ("option Nanomaterials and Nanochemistry")
 - np ("option Nanophysics Engineering")
 - qe ("option Quantum engineering, Materials and Technology")
- obsolete:
- nd.2023 ("option Nanodevices and Nanophysics")
 - ne.2023 ("option Nanoelectronic Design")
- emnan** ERASMUS MUNDUS MASTER OF SCIENCE IN NANOSCIENCE AND NANOTECHNOLOGY
 English master.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
 Leuven
 The master's programme doesn't require you to mention an option.
 Known master's programme option abbreviations:
- bn ("graduation option Bionanotechnology")
 - bp ("graduation option Biophysics")
 - nc ("graduation option Nanochemistry")
 - ne ("graduation option Nanoelectronics")
 - nn ("graduation option Nanomedicine and Nanotheranostics")
 - np ("graduation option Nanophysics")
 - ma ("graduation option Modelling and Analysis at the Nanoscale")
 - om ("graduation option Organic and Molecular Electronics")
 - qc ("graduation option Quantum Computing")
 - qn ("graduation option Quantum and Nanoscale Engineering")
- obsolete:
- me.2021 ("graduation option Molecular Electronics")
 - nm.2022 ("graduation option Nanomaterials")
 - np.2022 ("graduation option Nanopharmacotherapy")

- esta** MASTER OF SCIENCE IN STATISTICS AND DATA SCIENCE
 English master.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
 Leuven
 The master's programme doesn't require you to mention an option.
 Known master's programme option abbreviations:
- bm ("profile Statistics and Data Science for Biometrics")
 - bs ("profile Statistics and Data Science for Business")
 - is ("profile Interdisciplinary Statistics and Data Science")
 - emos ("profile European Master of Official Statistics")
 - sbe ("profile Statistics and Data Science for Social, Behavioral and Educational Sciences")
 - si ("profile Statistics and Data Science for Industry")
 - th ("profile Theoretical Statistics and Data Science")
 - qas ("abridged programme – Quantitative Analysis in the Social Sciences")
- ewit** MASTER OF SCIENCE IN MATHEMATICAL ENGINEERING
 English master of the Faculty of Engineering Science.
 Contact info: Department of Computer Science, Celestijnenlaan 200A bus 2402, B-3001
 Leuven
 The master's programme doesn't require you to mention an option.
- ewtk** MASTER OF SCIENCE IN MECHANICAL ENGINEERING
 English master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
 Leuven
 The master's programme doesn't allow you to mention an option.

A.1.3 Advanced master's programmes

- cms** MASTER OF SCIENCE IN CONSERVATION OF MONUMENTS AND SITES
 English master of the Faculty of Engineering Science.
 Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
 Leuven
 The master's programme doesn't require you to mention an option.
- mai** MASTER OF SCIENCE IN ARTIFICIAL INTELLIGENCE
 English master of the Faculty of Engineering Science.
 Contact info: Department of Computer Science, Celestijnenlaan 200A bus 2402, B-3001
 Leuven
 The master's programme doesn't require you to mention an option.
 Known master's programme option abbreviations:
- bda ("specialisation Big Data Analytics")
 - ecs ("specialisation Engineering and Computer Science")
 - slt ("specialisation Speech and Language Technology")
- obsolete: - bda.2022 ("option Big Data Analytics")

- ecs.2022 (“option Engineering and Computer Science”)
- slt.2022 (“option Speech and Language Technology”)

mcs	MASTER OF SCIENCE IN CYBERSECURITY English master of the Faculty of Engineering Science. Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven The master’s programme doesn’t require you to mention an option.
mdh	MASTER OF SCIENCE IN DIGITAL HUMANITIES English master of the Faculty of Engineering Science. Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven The master’s programme doesn’t require you to mention an option.
mhs	MASTER OF SCIENCE IN HUMAN SETTLEMENTS English master of the Faculty of Engineering Science. Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven The master’s programme doesn’t require you to mention an option.
mms	MASTER OF SCIENCE IN DE MEDISCHE STRALINGSFYSICA Dutch master. Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven The master’s programme doesn’t require you to mention an option.
mne	MASTER OF SCIENCE IN NUCLEAR ENGINEERING English master of the Faculty of Engineering Science. Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven The master’s programme doesn’t require you to mention an option.
mse	MASTER OF SCIENCE IN SAFETY ENGINEERING English master of the Faculty of Engineering Science. Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001 Leuven A master’s programme option must be specified. Known master’s programme option abbreviations: <ul style="list-style-type: none">- p (“option Prevention”)- ps (“option Process Safety”)

- mss** MASTER OF SCIENCE IN SPACE STUDIES
English master.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
– slpbm ("profile Space Law, Policy, Business and Management")
– ss ("profile Space Sciences")
– sta ("profile Space Technology and Applications")
- ulp** MASTER OF SCIENCE IN URBANISM, LANDSCAPE AND PLANNING
English master of the Faculty of Engineering Science.
Contact info: Faculty of Engineering Science, Kasteelpark Arenberg 1 bus 2200, B-3001
Leuven
The master's programme doesn't require you to mention an option.
Known master's programme option abbreviations:
obsolete: – sp.2022 ("option Spatial Planning")

A.1.4 Obsolete master's programmes

- mlt.2020** MASTER OF SCIENCE IN DE INGENIEURSWETENSCHAPPEN: LOGISTIEK EN VERKEER
Dutch master of the Faculty of Engineering Science.
Contact info: Centre for Industrial Management, Celestijnenlaan 300A bus 2422, B-3001
Leuven
The master's programme doesn't require you to mention an option.
- emlt.2020** MASTER OF ENGINEERING: LOGISTICS AND TRAFFIC
English master of the Faculty of Engineering Science.
Contact info: Centre for Industrial Management, Celestijnenlaan 300A bus 2422, B-3001
Leuven
The master's programme doesn't require you to mention an option.

LaTeX Template

LaTeX templates are provided for a Dutch master's programme as well as for an English one. The Dutch and English examples can be found in respectively the `sjabloon.zip` and `template.zip` files on the website [19].

The following sections give examples of the most important files of the template: the main file (§B.1), a sample chapter (§B.2), and the bibliography database (§B.3). Translated versions for a Dutch master's programme can be found in `sjabloon.zip`. Finally §B.4 gives an example of a main file for a Dutch master's programme but written in English.

All the examples below use the `lipsum` package to generate dummy text. Of course this is only needed as an example to quickly generate a lot of text. Because you will never need it in your real text, you can start by removing all invocations of `\lipsum` in all files as well as the lines 20–27 of the main files (§B.1 and §B.4).

B.1 The main file

template/thesis.tex

```

1 \documentclass[master=eelt,masteroption=ec]{kulemt}
2 \setup{
3   title={The best master's thesis ever},
4   author={First Author\and Second Author},
5   promotor={Prof.\,dr.\,ir.\ Knows Better},
6   assessor={Ir.\,Kn. Owsmuch\and K. Nowsrest},
7   assistant={Ir.\ An-Assistent \and A.-Friend}}
8 % Remove the "%" on the next line for generating the cover page
9 %\setup{coverpageonly}
10 % Remove the "%" before the next "\setup" to generate only the first pages
11 % (e.g., if you are a Word user).
12 %\setup{frontpagesonly}
13
14 % If you want to include other LaTeX packages, do it here.
15
16 % Finally the hyperref package is used for pdf files.
17 % This can be commented out for printed versions.
18 \usepackage[pdftitle,colorlinks,plainpages=false]{hyperref}
19
20 %%%
21 % The lipsum package is used to generate random text.
```

```

22 % You never need this in a real master's thesis text!
23 \IfFileExists{lipsum.sty}%
24   {\usepackage{lipsum}\SetLipsumDefault{11-13}}%
25   {\newcommand{\lipsum}[1][11-13]{\par And some text: lipsum ##1.\par}}
26   %%%%%%%%%
27
28 %\includeonly{chapter-n}
29 \begin{document}
30
31 \begin{preface}
32   I would like to thank everybody who kept me busy the last year,
33   especially my promoter and my assistants. I would also like to thank the
34   jury for reading the text. My sincere gratitude also goes to my wife and
35   the rest of my family.
36 \end{preface}
37
38 \tableofcontents*
39
40 \begin{abstract}
41   The \texttt{abstract} environment contains a more extensive overview of
42   the work. But it should be limited to one page.
43
44   \lipsum[1]
45 \end{abstract}
46
47 % A list of figures and tables is optional
48 %\listoffigures
49 %\listoftables
50 % If you only have a few figures and tables you can use the following instead
51 \listoffiguresandtables
52 % The list of symbols is also optional.
53 % This list must be created manually, e.g., as follows:
54 \chapter{List of Abbreviations and Symbols}
55 \section*{Abbreviations}
56 \begin{flushleft}
57   \renewcommand{\arraystretch}{1.1}
58   \begin{tabularx}{\textwidth}{@{}p{12mm}X@{}}
59     LoG   & Laplacian-of-Gaussian \\
60     MSE   & Mean Square error \\
61     PSNR  & Peak Signal-to-Noise ratio \\
62   \end{tabularx}
63 \end{flushleft}
64 \section*{Symbols}
65 \begin{flushleft}
66   \renewcommand{\arraystretch}{1.1}
67   \begin{tabularx}{\textwidth}{@{}p{12mm}X@{}}
68     42    & ``The Answer to the Ultimate Question of Life, the Universe,
69           & and Everything'' according to \cite{h2g2} \\
70     $c$   & Speed of light \\
71     $E$   & Energy \\
72     $m$   & Mass \\
73     $\pi$ & The number pi \\
74   \end{tabularx}
75 \end{flushleft}

```

```

76
77 % Now comes the main text
78 \mainmatter
79
80 \include{intro}
81 \include{chapter-1}
82 \include{chapter-2}
83 % ... and so on until
84 \include{chapter-n}
85 \include{conclusion}
86
87 % If you have appendices:
88 \appendixpage*           % if wanted
89 \appendix
90 \include{appendix-1}
91 % ... and so on until
92 \include{appendix-n}
93
94 \backmatter
95 % The bibliography comes after the appendices.
96 % You can replace the standard "abbrv" bibliography style by another one.
97 \bibliographystyle{abbrv}
98 \bibliography{references}
99
100 \end{document}

```

B.2 A sample chapter

template/chapter-1.tex

```

1 \chapter{The First Chapter}
2 \label{cha:1}
3 A chapter is a logical unit. It normally starts with an introduction, which
4 you are reading now. The last topic of the chapter holds the conclusion.
5
6 \section{The First Topic of the Chapter}
7 First comes the introduction to this topic.
8
9 \lipsum[55]
10
11 \subsection{An item}
12 Please don't abuse enumerations: short enumerations shouldn't use
13 ``\verb|itemize|'' or ``\texttt{enumerate}'' environments.
14 So \emph{never write}:
15 \begin{quote}
16     The Eiffel tower has three floors:
17     \begin{itemize}
18     \item the first one;
19     \item the second one;
20     \item the third one.
21     \end{itemize}
22 \end{quote}
23 But write:

```

```

24 \begin{quote}
25   The Eiffel tower has three floors: the first one, the second one, and the
26   third one.
27 \end{quote}
28
29 \section{A Second Topic}
30 First we start with equation~\ref{eq:1} after this paragraph.
31 \begin{equation}
32   \label{eq:1}
33   A = \pi r^2
34 \end{equation}
35
36 \lipsum[64]
37
38 \subsection{Another item}
39 \lipsum[56-57]
40
41 \section{Conclusion}
42 The final section of the chapter gives an overview of the important results
43 of this chapter. This implies that the introductory chapter and the
44 concluding chapter don't need a conclusion.
45
46 \lipsum[66]

```

B.3 The bibliography database

template/references.bib

```

1  @Preamble{{\providecommand\pkg{\textsf{}}}
2
3  @Book{grboek,
4    author   = "{Nederlandse Taalunie}",
5    title    = "Woordenlijst Nederlandse Taal",
6    publisher = "Van Dale",
7    year     = 2021,
8    url      = "https://woordenlijst.org/"}
9
10 @Manual{memdesign,
11   author = "Peter Wilson",
12   title  = "A Few Notes on Book Design",
13   month  = sep,
14   year   = 2018,
15   url    = "https://mirror.ctan.org/info/memdesign/memdesign.pdf"}
16
17 @Webpage{siunits,
18   author = "Wikipedia",
19   title  = "{International System of Units}",
20   url    = "https://en.wikipedia.org/wiki/International_System_of_Units"}
21
22 @Webpage{templates,
23   key    = "Master's thesis",
24   title  = "Master's thesis templates of the {Faculty of Engineering Science}",
25   url    = "https://eng.kuleuven.be/docs/kulemt/"}

```

```
26 | year = 2025}
```

B.4 The main file for a Dutch master's programme with an English text

The main differences between an English text for an English master's programme (§B.1) and an English text for an Dutch master's programme are:

- the use of the english option (line 1);
- an additional abstract* environment is needed (lines 51–59).

```

template/thesis-dutch.tex
1 | \documentclass[master=elt,masteroption=ec,english]{kulemt}
2 | \setup{
3 |   title={The best master's thesis ever},
4 |   author={Een Auteur\and Tweede Auteur},
5 |   promotor={Prof.\,dr.\,ir.\ Weet Beter},
6 |   assessor={Ir.\,W. Eetveel\and W. Eetrest},
7 |   assistant={Ir.\ A.-Assistent \and D.-Vriend}}
8 | % Verwijder de "%" op de volgende lijn als je de kapt wil afdrukken
9 | %\setup{coverpageonly}
10 | % Verwijder de "%" op de volgende lijn als je enkel de eerste pagina's wil
11 | % afdrukken en de rest bv. via Word aanmaken.
12 | %\setup{frontpagesonly}
13 |
14 | % Hier kun je dan nog andere pakketten laden of eigen definities voorzien
15 |
16 | % Tenslotte wordt hyperref gebruikt voor pdf bestanden.
17 | % Dit mag verwijderd worden voor de af te drukken versie.
18 | \usepackage[pdftitle,colorlinks,plainpages=false]{hyperref}
19 |
20 | %%%%%%%%%
21 | % Om wat tekst te genereren wordt hier het lipsum pakket gebruikt.
22 | % Bij een echte masterproef heb je dit natuurlijk nooit nodig!
23 | \IfFileExists{lipsum.sty}%
24 |   {\usepackage{lipsum}\SetLipsumDefault{11-13}}%
25 |   {\newcommand{\lipsum}[1][11-13]{\par Hier komt wat tekst: lipsum ##1.\par}}
26 | %%%%%%%%%
27 |
28 | %\includeonly{chapter-n}
29 | \begin{document}
30 |
31 | \begin{preface}
32 |   I would like to thank everybody who kept me busy the last year,
33 |   especially my promotor and my assistants. I would also like to thank the
34 |   jury for reading the text. My sincere gratitude also goes to my wife and
35 |   the rest of my family.
36 | \end{preface}
37 |
38 | \tableofcontents*
39 |

```

```

40 \begin{abstract}
41   The \texttt{abstract} environment contains a more extensive overview of
42   the work. But it should be limited to one page.
43
44   \lipsum[1]
45 \end{abstract}
46
47 \begin{abstract*}
48   In dit \texttt{abstract} environment wordt een al dan niet uitgebreide
49   Nederlandse samenvatting van het werk gegeven.
50   Wanneer de tekst voor een Nederlandstalige master in het Engels wordt
51   geschreven, wordt hier normaal een uitgebreide samenvatting verwacht,
52   bijvoorbeeld een tiental bladzijden.
53
54   \lipsum[1]
55 \end{abstract*}
56
57 % Een lijst van figuren en tabellen is optioneel
58 %\listoffigures
59 %\listoftables
60 % Bij een beperkt aantal figuren en tabellen gebruik je liever het volgende:
61 \listoffiguresandtables
62 % De lijst van symbolen is eveneens optioneel.
63 % Deze lijst moet wel manueel aangemaakt worden, bv. als volgt:
64 \chapter{List of Abbreviations and Symbols}
65 \section*{Abbreviations}
66 \begin{flushleft}
67   \renewcommand{\arraystretch}{1.1}
68   \begin{tabularx}{\textwidth}{@{}p{12mm}X@{}}
69     LoG   & Laplacian-of-Gaussian \\
70     MSE   & Mean Square error \\
71     PSNR  & Peak Signal-to-Noise ratio \\
72   \end{tabularx}
73 \end{flushleft}
74 \section*{Symbols}
75 \begin{flushleft}
76   \renewcommand{\arraystretch}{1.1}
77   \begin{tabularx}{\textwidth}{@{}p{12mm}X@{}}
78     42    & ``The Answer to the Ultimate Question of Life, the Universe,
79           & and Everything'' according to \cite{h2g2} \\
80     $c$   & Speed of light \\
81     $E$   & Energy \\
82     $m$   & Mass \\
83     $\pi$ & The number pi \\
84   \end{tabularx}
85 \end{flushleft}
86
87 % Nu begint de eigenlijke tekst
88 \mainmatter
89
90 \include{intro}
91 \include{chapter-1}
92 \include{chapter-2}
93 % ... en zo verder tot

```

B.4. The main file for a Dutch master's programme with an English text

```
94 \include{chapter-n}
95 \include{conclusion}
96
97 % Indien er bijlagen zijn:
98 \appendixpage*          % indien gewenst
99 \appendix
100 \include{appendix-1}
101 % ... en zo verder tot
102 \include{appendix-n}
103
104 \backmatter
105 % Na de bijlagen plaatst men nog de bibliografie.
106 % Je kan de standaard "abbrv" bibliografiestijl vervangen door een andere.
107 \bibliographystyle{abbrv}
108 \bibliography{references}
109
110 \end{document}
```




Terminology

BACK MATTER

The back matter conveys information ancillary to that in the main matter, such as a bibliography, an index, or a glossary.

COPYRIGHT PAGE

Second (unnumbered) page of the thesis, containing the copyright statements. It is part of the front pages.

COVER PAGE

The cover page ('kaft' in Dutch) will be printed on the front of the hard cover of your booklet. It is the same as the title page but can be generated separately.

DOCUMENT CLASS OPTION (LaTeX)

A document class option can only be used as an option of the `\documentclass` command.

ENGINE (LaTeX)

In TeX parlance, the engine is the programme which compiles the TeX document using a macro package. Several engines currently exist: TeX (the original by D. Knuth, outputting `.dvi`), eTeX (TeX with some extended capabilities), pdfTeX (extended eTeX and additional PDF output), XeTeX (eTeX which can use system fonts), and LuaTeX (scriptable pdfTeX). All these engines can preload the LaTeX macro package. On modern systems, `latex` means pdfTeX in compatibility mode (equivalent to the TeX engine) with LaTeX preloaded and `pdflatex` means pdfTeX with LaTeX preloaded (generating `.pdf` output). The commands `xelatex` and `lualatex` run respectively the engine XeTeX or LuaTeX with LaTeX preloaded.

FONT

A font is a set of visual representations of characters in a specific typeface.

FONT FAMILY

A font family is a set of fonts designed to work harmoniously together. Typically this means at least a roman font and an italic font. But it can be extended to combinations of serif and sans-serif fonts.

FRONT MATTER

The front matter is the part of the thesis, which contains the introductory material such as a preface, an abstract, and content lists (table of contents, list of tables, list of figures, list of symbols, etc.).

FRONT PAGES

In this text the front pages refer to the title page and the copyright page.

LEADING

Leading is the vertical space between two lines of text. The line spacing is the font size plus the leading.

MAIN MATTER

The main matter is the middle part of the thesis, between the front and the back matter. It contains the actual information of the thesis in regular chapters and appendices.

MASTER'S PROGRAMME LANGUAGE

The master's programme language refers to the official language of the master's programme. Usually it is the same as the text language but not necessarily.

OPTICAL ALIGNMENT OF MARGINS

Some characters (e.g., punctuation) can make a line appear shorter than others to the human eye. Shifting such characters by an appropriate amount into the margins (called character protrusion) gives the impression that the margins are aligned and not ragged.

POINT (PT)

A point (pt) is a printer's unit: $72.27 \text{ pt} = 1 \text{ inch} = 25.4 \text{ mm}$. PostScript and other popular software, such as word processors, use a slightly larger point size: $72 \text{ pt} = 1 \text{ inch}$.

PREAMBLE (LaTeX)

The document preamble is the part of a LaTeX document, which comes before the `\begin{document}` command.

PROTRUSION

See "Optical alignment of margins".

RECTO PAGE

The recto page is the right-hand page of a printed book. It normally corresponds to odd numbered pages.

SERIF

A serif is a cross stroke at the bottom of a letter. Compare a serif and a sans-serif typeface: "A serif" and "A sans-serif".

TEXT LANGUAGE

The text language refers to the language used to write the text in. Usually it is the same as the master's programme language but not necessarily.

TITLE PAGE

The first (unnumbered) page of the thesis. It is part of the front pages.

TYPEFACE

A typeface is a visual style to represent characters, regardless of their size. This sentence uses the typeface Libertinus Serif.

VERSO PAGE

The verso page is the left-hand page of a printed book. It normally corresponds to even numbered pages.

Bibliography

Local documentation can be accessed from the command line using the `texdoc` programme (`mthelp` on a MikTeX installation). That local documentation corresponds to the packages installed on your system. The most recent documentation can be found online using the URL.

- [1] *CTAN: The Comprehensive TeX Archive Network.*
URL: ctan.org
CTAN is the central place for all kinds of material around TeX.
- [2] *CTAN: Topic page on PGF & TikZ.*
URL: ctan.org/topic/pgf-tikz
CTAN's resources for the TikZ universe.
TikZ and PGF examples can be found on texample.net/tikz/examples.
- [3] *Getting started with TeX, LaTeX, and friends.*
URL: tug.org/begin.html.
- [4] *Learn LaTeX.*
URL: www.learnlatex.org/en
Take your first steps with LaTeX, a document preparation system designed to produce high-quality typeset output.
- [5] *texdoc. Documentation access for TeX Live.*
URL: texdoc.org
Local documentation: `texdoc -l <name>`.
- [6] *The L^AT_EX Font Catalogue.*
URL: tug.org/FontCatalogue.
- [7] *The TeX Frequently Asked Question List.*
URL: texfaq.org.
- [8] Philip Kime and François Charette. *biber. A BIB_TE_X replacement for users of biblatex.*
Version 2.20. 21 Mar. 2024.
URL: ctan.org/pkg/biber
Local documentation: `texdoc biber`
To be used with the package biblatex [9].

-
- [9] Philip Kime, Moritz Wemheuer and Philipp Lehman. *The biblatex package. Programmable bibliographies and citations*. Version 3.20. 21 Mar. 2024.
URL: ctan.org/pkg/biblatex
Local documentation: `texdoc biblatex`.
- [10] Lars Madsen. *Various chapter styles for the memoir class*. 11 Apr. 2012.
URL: mirror.ctan.org/info/latex-samples/MemoirChapStyles/MemoirChapStyles.pdf
Local documentation: `texdoc memoirchapstyles`.
- [11] Nicolas Markey. *Tame the BeaST – The B to X of BibTeX*. 11 Oct. 2009.
URL: mirror.ctan.org/info/bibtex/tamethebeast/ttb_en.pdf
Local documentation: `texdoc tamethebeast`
A BibTeX tutorial.
- [12] Frank Mittelbach and Ulrike Fischer. *The L^AT_EX Companion*. 3rd edition. Tools and Techniques for Computer Typesetting. With contributions by Javier Bezos, Johannes Braams, and Joseph Wright. Boston, Massachusetts: Addison-Wesley, 2023.
- [13] Tobias Oetiker et al. *A Not So Short Introduction to L^AT_EX 2_ε. Or L^AT_EX 2_ε in 139 minutes*. 9 Mar. 2021.
URL: mirror.ctan.org/info/lshort/english/lshort.pdf
Local documentation: `texdoc -l lshort`.
- [14] Scott Pakin. *The Comprehensive L^AT_EX Symbol List*. 27 Jan. 2024.
URL: mirror.ctan.org/info/symbols/comprehensive/symbols-a4.pdf
Local documentation: `texdoc symbols`.
- [15] Sebastian Rahtz, Heiko Oberdiek and The L^AT_EX3 Project. *The hyperref package. Extensive support for hypertext in L^AT_EX*. Version 7.01l. 5 Nov. 2024.
URL: ctan.org/pkg/hyperref
Local documentation: `texdoc hyperref`.
- [16] Robert Schlicht. *The microtype package. Subliminal refinements towards typographical perfection*. Version 3.2a. 11 Feb. 2025.
URL: ctan.org/pkg/microtype
Local documentation: `texdoc microtype`
A LaTeX interface to the micro-typographic extensions available in pdfTeX, LuaTeX and XeTeX.
- [17] Till Tantau. *The TikZ and PGF packages*. Version 3.1.10. 15 Jan. 2023.
URL: ctan.org/pkg/pgf
Local documentation: `texdoc tikz`
The pgf package is a platform- and format-independent package for creating graphics. It comes with a user-friendly syntax layer in the tikz package, which is also described in the [PGF manual](#).
See also *CTAN: Topic page on PGF & TikZ* [2].
- [18] Luc Van Eycken. *Guidelines for writing a master’s thesis at the KU Leuven Faculty of Engineering Science*. 31 Mar. 2025.
URL: eng.kuleuven.be/docs/kulemt/guidelines_thesis.pdf.

- [19] Luc Van Eycken. *The kulemt document class*. Version 2.1. 29 Apr. 2025.
URL: eng.kuleuven.be/docs/kulemt/latex
A document class implementing the guidelines of the KU Leuven Faculty of Engineering Science.
- [20] Luc Van Eycken. *The source of the kulemt class*. 29 Apr. 2025.
URL: eng.kuleuven.be/docs/kulemt/latex/kulemt-code.pdf
The annotated source of the kulemt class [19].
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URL: mirror.ctan.org/macros/latex/contrib/memoir/memman.pdf
User guide for the memoir class [22].
- [22] Peter Wilson and Lars Madsen. *The memoir document class*. Version 3.8.2. 26 Jan. 2024.
URL: ctan.org/pkg/memoir
Local documentation: `texdoc memoir`
The memoir class is for typesetting poetry, fiction, non-fiction, and mathematical works. The kulemt class [19] is based on it.