Documentation of the LaTeX class

`sapthesis.cls`

Version 3.8, 2015-12-04

Francesco Biccari*

Abstract

This document describes how to use `sapthesis.cls`, a LaTeX document class for the typesetting of the theses of the "Sapienza – University of Rome". The official web page of sapthesis is

http://biccari.altervista.org/c/informatica/latex/sapthesis.php.

Contents

---

*biccari@gmail.com

1 Introduction

After several years in my faculty I noticed that usually students spend a lot of time to refine the aesthetic aspect of their LaTeX documents instead of focusing on the content. This is against the philosophy of LaTeX, which was created to relieve the writer from the typesetter's work. Apart from the time spent, the resulting documents are obviously all different from each other and good aesthetic results are not always achieved. This has a negative impact both on the student's work and on the university. Moreover in 2007 the Sapienza university changed completely its logo and a lot of strict graphic rules for official documents were introduced.[1]

For these reasons I thought that a LaTeX class for the theses of my university would have been a good idea. Sapthesis is the result of my work. To give a look to a document composed by `sapthesis` class, compile one of the several examples in the `examples` directory. In those files the page layout and the layout choices are explained. Sapthesis is released under the terms of the latest version of the LaTeX Project Public License.

I would like to thank the Italian TeX user group (GuIT) for the help provided, in particular Enrico Gregorio and Claudio Beccari. I would also thank all the users who reported bugs and suggestions.

2 Requirements and installation

The simplest way to install `sapthesis` is by the package manager of your TeX distribution (TeX Live or MiKTeX). For manual installation see the `README` file.

The `sapthesis` package provides: the `sapthesis.cls` class file; the documentation `sapthesis-doc.pdf` (this file) and its source code; the logos of Sapienza university; several usage examples; an English BibTeX style, called `sapthesis.bst`, which can be used, obviously, only if you use the BibTeX way to compose your bibliography and if your thesis is written in English (its usage is not mandatory).

Sapthesis explicitly loads the packages xkeyval, geometry, ifxetex, xltxtra, fontenc, textcomp, lmodern, caption, graphicx, color, booktabs, amsmath, fancyhdr. Do **not** include these packages in the preamble of your document!

---

[1]A thesis is not an official document and therefore these guidelines can not be applied (private communication with Laura Gobbo, Ufficio Stampa e Comunicazione Sapienza – Università di Roma). However some Microsoft Word templates, with a completely different style, are provided. To give a look to the new Sapienza style see Identità visiva e marchio and Template tesi.

3 Usage

A LaTeX document based on sapthesis can be compiled only by the commands
`pdflatex` and `xelatex`. In this manual only `pdflatex` will be considered.

As usual, in order to use this class, you need to call it by

```
\documentclass[options]{sapthesis}
```

You have to specify the class options for your case (see Sec. 3.1). Then you have to
provide some fundamental information (title, author, etc. . .) by specific commands
in the preamble (see Sec. 3.2). Finally, remember to follow a source code structure
similar to those of the examples given in App. C and D. Especially the usage of
the commands \frontmatter, \mainmatter and \backmatter is mandatory,
otherwise the page style of the document will be wrong!

This class supports, at the moment, two languages: Italian and English. English
is the default. If your thesis contains only English or very few paragraphs in
another language, do not use the babel package because completely useless.
Instead, if you write in italian, load the babel package with the `italian` option:
\usepackage[italian]{babel}.

3.1 Class options

The following options can be passed to the \documentclass command.

PhD Option to typeset a *Dottorato di Ricerca* (PhD) thesis.

LaM Option to typeset a *Laurea Magistrale* (Master's degree) thesis.

Lau Option to typeset a *Laurea* (Bachelor's degree) thesis.

MasterP Option to typeset a thesis for a *Master di primo livello* (First level master).

MasterS Option to typeset a thesis for a *Master di secondo livello* (Second level master).

TFA Option to typeset the final report for a *Tirocinio Formativo Attivo*.

Specialization Option to typeset a thesis for a *Specializzazione*.

draft The usual `draft` option of the LaTeX Standard Classes.

oneside The usual `oneside` option of the LaTeX Standard Classes.

twoside (default) The usual `twoside` option of the LATEX Standard Classes.

bn This option typesets the title page in black and white (using the b/w logo, `sapienza-MLblack-pos.pdf`, instead of the colored one) and passes the `monochrome` option to color and xcolor packages.

binding=*length* (zero default binding) The value of this option is an offset of the text column. It is useful to take into account the margin for the binding (ask to your bookbinder for information).

noexaminfo Suppress all the final exam informations. Indeed, by default, sapthesis shows some information about the final thesis discussion on the back of the title page. By default it shows the phrase "Thesis not yet defended". Otherwise, as explained later, giving the commands `\examdate{...}` and `\examiner{...}` the date and the examiners list are shown.

italian or english Explicitly declare the language of the title page. Useful when you want to write the title page in a language and the thesis in a different language.

nodefaultfont Avoid the loading of packages fontenc, textcomp and lmodern.

romandiff See App. F.

fem Use the feminine (only Italian): shows "candidata" instead of "candidato".

3.2 Commands for the title page

As usual, the title page is generated by the `\maketitle` command. It needs some information that you can supply by the following commands in the preamble.

\title{...} Mandatory.

\author{...} Mandatory

\IDnumber{...} Mandatory. Your ID number (*matricola* in Italian)

\course[...]{...} Mandatory. Use the official Italian name of the course. The optional argument specifies the course name in another language, which is needed in the case of PhD's theses because of the "requirements" declaration.

\courseorganizer{...} Mandatory.

\submitdate{...} Mandatory. Use the form \submitdate{April 2009} for PhD's and the form \submitdate{2009/2010} for Laurea theses.

\AcademicYear{...} Alias for \submitdate.

\copyyear{...} Mandatory. Copyright year (usually the graduation year).

\advisor{...} You must specify at least one advisor. If you have more than one advisor, put several advisor commands in the correct order: \advisor{Prof. Pippo} \advisor{Dr. Pluto}

\coadvisor{...} Optional. Co-advisors of the thesis. Same syntax of the \advisor command.

\authoremail{...} Mandatory. Email of the thesis author. It is automatically hyper-linked if hyperref package is loaded.

\versiondate{...} Optional. Date version of the thesis.

\website{...} Optional. Thesis website. Automatically hyper-linked if hyperref package is loaded.

\ISBN{...} Optional. ISBN

\examdate{...} Optional. Date of the final exam. Example: \examdate{16 February 2010}.

\examiner{...} Optional. Specifies the members of the board of examiners of the final exam. Usage similar to \advisor command.

\cycle{...} Mandatory only for PhD's. Use the form: \cycle{XXII}

\director{...} Only for Specialization. Mandatory.

\tutor{...} and \tutorcoord{...} Only for TFA. Mandatory.

\schoolname{...} Only for TFA. Mandatory. Name of the school.

\schooladdress{...} Only for TFA. Mandatory. School's address.

\schoolwebsite{...} Only for TFA. Optional. School's website.

\schoolprincipal{...} Only for TFA. Mandatory. School's principal.

3.3 Other commands and environments

\dedication{...} A command to compose the dedication.

abstract An environment to compose the abstract of your document. This environment has an optional parameter to choose the title of the abstract section. If you use a language for the abstract different from that of the thesis, consider the \selectlanguage{...} command provided by the babel package.

acknowledgments An environment to compose the acknowledgments of your document. This environment has an optional parameter to choose the title of the acknowledgments section. If you use a language for the acknowledgments different from that of the thesis, consider the \selectlanguage{...} command provided by the babel package.

The sapthesis class defines also the color sapred which is the *Sapienza red*: RGB(130,36,51). This color is switched to black if the bn option is in use. Example of usage: ...\textcolor{sapred}{blah blah blah}...

4 Recommendations

- Do **not** change the default layout and do **not** use packages which can modify the layout of your thesis. However if you want to change the interline spacing, do not use the \linespread command. Load instead the setspace package and use the \onehalfspacing command.

- Do **not** load the packages already loaded by sapthesis (see Sec. 2).

- As you already should know, LATEX can process only documents in pure ASCII. If you want to insert *directly* other characters, not included in the 128 ASCII characters (for example accented letters), you have to use a particular text encoding for your source file. Then you have to "tell" to LATEX which encoding you have chosen by the packages inputenc or inputenx.

  However, if your thesis is in English, I suggest to avoid the use of a particular text encoding for the source code because you will insert non ASCII characters very seldom. For this reason it is better to write these characters by the usage of the LATEX commands (for example \'e for the é letter), avoiding to load inputenc or inputenx package. This has another advantage, in fact your source file will be very portable.

- Respect the following thesis structure:

  - Title page (\maketitle command)
  - Dedication (\dedication command)
  - Abstract (abstract environment)
  - Acknowledgements (acknowledgments environment)
  - Table of contents (\tableofcontens command)
  - Chapters
  - Appendices
  - Bibliography

- It is recommended to avoid or limit the acknowledgments in a thesis, it is not very professional. The dedication should be enough.

- Do not put any preface in your thesis. The preface should be written only by an eminent expert in the field to comment exceptionally important results of the student.

- Usually tables and figures are centered. Remember that, according to the typographic rules, the table captions should be placed **above** the table, whereas the figure caption should be placed **below** the figure.

- If the figure has a small width, it is possible to put the figure caption aside the figure using the sidecap package (not preloaded by sapthesis).

- Avoid the use of colors unless really necessary. Remember that the figures should be readable even if they are printed in gray scale!

- Subscripts and superscripts should be in italic if they represent variable quantities, whereas should be in roman if they are simply labels.

- The name of operators should be typed in roman. Example: use sin ($\sin$) instead of *sin* (sin).

- The margin notes are rarely used in scientific documents and should **not** be used in a scientific thesis.

- Do not divide the bibliography per chapter unless it is **really** necessary. This will save you from wasting a lot of time to prepare your LATEX source code. Order your bibliography alphabetically according to the first author surname: this order is very useful, contrary to the other typical order, the citation order.

A   A very brief introduction to the TEX world

Many people want to (or are compelled to) write in LaTeX without studying a basic manual. Here follows a very brief introduction to the TEX world.

TEX, the document preparation system designed by Donald Knuth in 1978, is a program to typeset documents. It is a mark-up language: you write a simple text decorated with TEX commands (source code) which is then compiled to obtain the final product, a document in pdf format. LaTeX is just a set of macros, written in TEX, to simplify the writing of the source code: it can be thought as a simpler programming language with respect to TEX. A source code written in LaTeX can be compiled by several "compilers": `pdflatex` (the most common), or `xelatex`, or others.

The following list of LaTeX manuals, may be especially useful for Italian authors.

- L. PANTIERI & T. GORDINI, *L'arte di scrivere con* LaTeX, (2012)

- S. PAKIN, *The comprehensive* LaTeX *symbol list*, (2015)

- E. GREGORIO, LaTeX*: breve guida ai pacchetti di uso più comune*, (2010)

In order to use LaTeX, you have to install a TEX distribution. It contains the compilers, several fonts and other files needed by the compilers and also many *packages*, which can be thought as libraries or extensions of LaTeX. The most famous distributions are MiKTeX (available only for Windows), TeX Live (available both for Windows and Linux) and MacTeX (available only for Mac OS).

Finally we discuss the editor, that is the program used to write your source file. Since a source file written in LaTeX, like in any other programming language, is a simple text file, you can write your code with any text editor you want (for example Notepad in Windows). However the suggested editors are:

- TeXworks. Already installed with any TEX distribution. Very simple and powerful. Use TeXworks if you are not an expert. Enrico Gregorio has written a very good and brief TeXworks manual in Italian, which can be found at: http://profs.sci.univr.it/~gregorio/egtex.html.

- TeXstudio (cross-platform), TeXmaker (cross-platform), TeXshop (only for Mac), Kile (only for Linux). Powerful editors.

- **Avoid** other editors unless you know what you are doing!

Finally we explain how to compile the example documents provided in the sapthesis package. Double click on one of the `.tex` file in the `examples` folder. TeXworks should start showing the content of that file. The `pdflatex` compiler should be automatically selected thanks to the *magic lines* placed at the beginning of the file. Now, in order to compile, press the green button. At the end of the compilation the resulting pdf appears in a separate window. Remember to compile at least three times, because LaTeX needs more than one compilation to correctly resolve the internal cross references (for example for the table of contents composition, or when you refer to a figure by the `\label` – `\ref`/`\pageref` mechanism).

B   Using LyX

LyX is an advanced LaTeX editor which does not simply show the source code like any text editor, but instead it renders maths, images, tables and some text formatting commands. However this "layer" between the writer and the real source code is sometimes frustrating and many authors discourage the usage of LyX.

Using sapthesis with LyX is quite straightforward.

- Install sapthesis by the package manager of your TeX distribution or manually.

- Copy the file `sapthesis.layout` in the directory
  `C:\Program Files\Lyx20\Resources\layouts\`
  and then, in LyX, click on Tools ⟩ Reconfigure. This will add the sapthesis class in the list of LyX available classes.

- In LyX, first of all, go in Tools ⟩ Preferences ⟩ Language Settings ⟩ Language and choose "none" in Language package. This step is necessary because LyX not only loads babel with the desired language, but it passes the language also as an option for the class! This triggers an error in many classes.

- Create a new document and go in Document ⟩ Settings ⟩ Document Class. Here you can choose sapthesis as the class for the document and write the class options.

- Write the preamble in Document ⟩ Settings ⟩ LaTeX Preamble.

- Create the titlepage inserting the title by the Title item in the LyX left menu.

It is recommended to activate View ⟩ Source Pane. This step is not necessary but it is very useful to observe the LaTeX code produced by LyX (on the right choose "Complete source" or "Preamble").

C PhD thesis example

```
% !TeX encoding = UTF-8
% !TeX program = pdflatex
% !TeX spellcheck = en_US

\documentclass[binding=0.6cm,PhD]{sapthesis}

\usepackage{microtype}
\usepackage{hyperref}
\hypersetup{pdftitle={My thesis},pdfauthor={Francesco Biccari}}

\title{My thesis}
\author{Francesco Biccari}
\IDnumber{123456}
\course[Philology]{Filologia}
\courseorganizer{Scuola di Dottorato in Scienze Filologiche}
\cycle{XXII}
\submitdate{October 2009}
\copyyear{2009}
\advisor{Prof. Caio}
\advisor{Dr. Sempronio}
\authoremail{pippo@pippo.com}

\begin{document}

\frontmatter
\maketitle
\dedication{Dedicated to\\ Donald Knuth}

\begin{abstract}
This thesis deals with myself.
\end{abstract}

\tableofcontents

\mainmatter
\chapter{Introduction}
...

\backmatter
\cleardoublepage
\phantomsection % Give this command only if hyperref is loaded
\addcontentsline{toc}{chapter}{\bibname}
% Here put the code for the bibliography. You can use BibTeX or
% the BibLaTeX package or the simple environment thebibliography.

\end{document}
```

D   Laurea (Magistrale) thesis example

```
% !TeX encoding = UTF-8
% !TeX program = pdflatex
% !TeX spellcheck = it_IT


\documentclass[binding=0.6cm,Lau]{sapthesis} % LaM for a Laurea Magistrale

\usepackage{microtype}
\usepackage[italian]{babel}
\usepackage[utf8]{inputenx}
\usepackage{hyperref}
\hypersetup{pdftitle={La mia tesi},pdfauthor={Francesco Biccari}}

\title{La mia tesi}
\author{Francesco Biccari}
\IDnumber{123456}
\course{Fisica}
\courseorganizer{Facoltà di Scienze Matematiche, Fisiche e Naturali}
\AcademicYear{2011/2012}
\copyyear{2012}
\advisor{Prof. Caio}
\advisor{Dr. Sempronio}
\authoremail{pippo@pippo.com}

\begin{document}

\frontmatter
\maketitle
\dedication{Dedicato a\\ Donald Knuth}

\begin{abstract}
Questa tesi parla di me.
\end{abstract}

\tableofcontents

\mainmatter
\chapter{Introduzione}
...

\backmatter
\cleardoublepage
\phantomsection % Give this command only if hyperref is loaded
\addcontentsline{toc}{chapter}{\bibname}
% Here put the code for the bibliography. You can use BibTeX or
% the BibLaTeX package or the simple environment thebibliography.

\end{document}
```

E   TFA thesis example

```
% !TeX encoding = UTF-8
% !TeX program = pdflatex
% !TeX spellcheck = it_IT


\documentclass[binding=0.6cm,TFA]{sapthesis}

\usepackage{microtype}
\usepackage[italian]{babel}
\usepackage[utf8]{inputenx}
\usepackage{hyperref}
\hypersetup{pdftitle={La mia tesi},pdfauthor={Francesco Biccari}}

\title{La mia tesi}
\author{Francesco Biccari}
\IDnumber{123456}
\course{A049 Matematica e Fisica}
\courseorganizer{Facoltà di Scienze Matematiche, Fisiche e Naturali}
\AcademicYear{2012/2013}
\copyyear{2013}
\advisor{Prof. Caio}
\tutor{Dr. Sempronio}
\tutorcoord{Dr. Sempronio}
\authoremail{pippo@pippo.com}

\schoolname{Liceo Scientifico Louis Pasteur}
\schooladdress{Via G. Barellai 130, 00135 Roma}
\schoolwebsite{http://www.liceopasteur.it/}
\schoolprincipal{Prof. Diego Armando Maradona}

\begin{document}

\frontmatter
\maketitle
\dedication{Dedicato a\\ Donald Knuth}

\tableofcontents

\mainmatter
\chapter{Introduzione}
...

\backmatter
\cleardoublepage
\phantomsection % Give this command only if hyperref is loaded
\addcontentsline{toc}{chapter}{\bibname}
% Here put the code for the bibliography. You can use BibTeX or
% the BibLaTeX package or the simple environment thebibliography.

\end{document}
```

F Other useful commands

\eu Napier's number, e, in roman.

\iu Imaginary unit, i, in roman.

\der{...}{...} Derivative. The first argument represents the function to derive while the second the variables separated by commas. The differential symbol is automatically inserted. Examples: \der{f}{x}, \der{f}{x,y}, \der{f}{*{3}{x}}, \der{f}{*{2}{x},*{2}{y},z}.

\pder{...}{...} Partial derivative. Same syntax of the \der command.

\rb{...} Roman suBscript

\rp{...} Roman suPerscript

\tb{...} Text suBscript

\tp{...} Text suPerscript

\un{...} Useful command to typeset measurement units in the correct way, e.g. 25\un{m/s}, 13\un{kg\,cm^{-3}}. It can be used both inside or outside the math environment. For heavy usage of measurement units and to insert numbers in the form 1.4e-5, the package siunitx is recommended.

\mnote{...} Fancy margin notes

\g Shortcut for the \degree command. Example: 45\g produces 45°.

\C Shortcut for the \celsius command. Example: 37\,\C produces 37 °C. (Not available in math mode compiling with xelatex).

\A Angstrom. Example: 10\,\A produces 10 Å.

\micro Micro prefix. Example: 7\,\micro m produces 7 µm.

\ohm Ohm. Example: 100\,\ohm produces 100 Ω.

\di Differential symbol with automatic spacing.
Example: $\int x \di x$ produces $\int x \, dx$. If you prefer the differential symbol in roman (d) you can give the option romandiff in the document class options.

\x Shortcut for the \times command. E.g.: $7 \x 10^5$ produces 7×10^5.