
Latex Class

- Basics of Latex
- How to prepare articles and books

Preliminaries

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

⋮

```
\usepackage[options]{class}
```

⋮

```
\pagestyle{style|}
```

⋮

```
\begin{document}  
... \end{document}
```

Class

- `[article]` for articles in scientific journals, presentations, short reports, program documentation, invitations, ...
- `[proc]` a class for proceedings based on the article class.
- `[minimal]` is as small as it can get. It only sets a page size and a base font. It is mainly used for debugging purposes.
- `[report]` for longer reports containing several chapters, small books, PhD theses, ...
- `[book]` for real books
- `[slides]` for slides. The class uses big sans serif letters.
- `[publisher provided]` Publishers themselves provide files for you.

Options

- [10pt, 11pt, 12pt] Sets the size of the main font in the document. If no option is specified, 10pt is assumed.
- [a4paper, letterpaper, ...] Defines the paper size. The default size is letterpaper. Besides that, a5paper, b5paper, executivepaper, and legalpaper can be specified.
- [fleqn] Typesets displayed formulae left-aligned instead of centred.
- [leqno] Places the numbering of formulae on the left hand side instead of the right.
- [titlepage, notitlepage] Specifies whether a new page should be started after the document title or not.

Options

- [`onecolumn`, `twocolumn`] Instructs L^AT_EX to typeset the document in one column or two columns.
- [`twoside`, `oneside`] Specifies whether double or single sided output should be generated. The classes `article` and `report` are single sided and the `book` class is double sided by default. Note that this option concerns the style of the document only. The option `twoside` does *not* tell the printer you use that it should actually make a two-sided printout.
- [`landscape`] Changes the layout of the document to print in landscape mode.
- [`openright`, `openany`] Makes chapters begin either only on right hand pages or on the next page available.

Packages

- [exscale] Provides scaled versions of the math extension font.
- [fontenc] Specifies which font encoding L^AT_EX should use.
- [ifthen] Provides commands of the form
‘if...then do...otherwise do...’
- [latexsym] To access the L^AT_EX symbol font, you should use the latexsym package.
- [makeidx] Provides commands for producing indexes.
- [syntonly] Processes a document without typesetting it.
- [amsmath, amssymb, amsfont] AMS Math society packages

Packages

- `[plain]` prints the page numbers on the bottom of the page, in the middle of the footer. This is the default page style.
- `[headings]` prints the current chapter heading and the page number in the header on each page, while the footer remains empty. (This is the style used in this document)
- `[empty]` sets both the header and the footer to be empty.

```
\thispagestyle{style}
```

Typesetting text

- The most important text unit in \LaTeX (and in typography) is the paragraph.
- You can force line breaks with e.g. `\`, and paragraph breaks with e.g. leaving an empty line in the source code. Many people, especially in \LaTeX , introduce paragraph breaks without knowing it.

Paragraph- unintended

Example 1

\ldots when Einstein introduced his formula

```
\begin{equation}
```

$$E = m \cdot c^2 ; ,$$

```
\end{equation}
```

which is at the same time the most widely known
and the least well understood physical formula.

Example 2

\ldots from which follows Kirchhoff's current law:

```
\begin{equation}
```

$$\sum_{k=1}^n I_k = 0 ; .$$

```
\end{equation}
```

Kirchhoff's voltage law can be derived \ldots

Example 1 ... when Einstein introduced his formula

$$e = m \cdot c^2 , \tag{1}$$

which is at the same time the most widely known and the least well understood physical formula.

Example 2 ... from which follows Kirchhoff's current law:

$$\sum_{k=1}^n I_k = 0 . \tag{2}$$

Kirchhoff's voltage law can be derived ...

Line Breaks

`\\` or `\newline`

starts a new line without starting a new paragraph.

`*`

additionally prohibits a page break after the forced line break.

`\newpage`

starts a new page.

`\linebreak[n]`, `\nolinebreak[n]`, `\pagebreak[n]` and `\nopagebreak[n]`

Words Together

- Several words can be kept together on one line with the command

```
\mbox{text}
```

It causes its argument to be kept together under all circumstances.

`\fbox` is similar to `\mbox`, but in addition there will be a visible box drawn around the content.

Sections

- The following sectioning commands are available for the `article` class:

```
\section{...}  
\subsection{...}  
\subsubsection{...}  
\paragraph{...}  
\subparagraph{...}
```

- Two of the sectioning commands are a bit special:
 - The `\part` command does not influence the numbering sequence of chapters.
 - The `\appendix` command does not take an argument. It

just changes the chapter numbering to letters.

- When you work with the `report` or `book` class, an additional top-level sectioning command becomes available

```
\chapter{...}
```

As the `article` class does not know about chapters, it is quite easy to add articles as chapters to a book. The spacing between sections, the numbering and the font size of the titles will be set automatically by L^AT_EX.

-
- L^AT_EX creates a table of contents by taking the section headings and page numbers from the last compile cycle of the document. The command

```
\tableofcontents
```

expands to a table of contents at the place it is issued.

- The title of the whole document is generated by issuing a

```
\maketitle
```

command. The contents of the title have to be defined by the commands

```
\title{...}, \author{...} and optionally \date{...}
```

before calling `\maketitle`.

-
- L^AT_EX provides the following commands for cross referencing

`\label{marker}, \ref{marker} and \pageref{marker}`

where *marker* is an identifier chosen by the user. L^AT_EX replaces `\ref` by the number of the section, subsection, figure, table, or theorem after which the corresponding `\label` command was issued. `\pageref` prints the page number of the page where the `\label` command occurred.

A reference to this page
`\label{page:this}` looks like:
“see page `~\pageref{page:this}`” ,

A reference to this page looks like:
“see page 15”

-
- With the command

```
\footnote{footnote text}
```

a footnote is printed at the foot of the current page.

Footnotes\footnote{This is
a footnote.} are often used
by people using \LaTeX.

Footnotes^a are often used by people
using L^AT_EX.

^aThis is a footnote.

-
- Emphasizing and Underlining.

```
\underline{text}
```

```
\emph{text}
```

```
\emph{If you use  
emphasizing inside a piece  
of emphasized text, then  
\LaTeX{} uses the  
\emph{normal} font for  
emphasizing.}
```

```
If you use emphasizing inside a piece  
of emphasized text, then LATEX uses  
the normal font for emphasizing.
```

Please note the difference between telling L^AT_EX to *emphasize* something and telling it to use a different *font*:

```
\textit{You can also  
  \emph{emphasize} text if  
  it is set in italics,}  
\textsf{in a  
  \emph{sans-serif} font,}  
\texttt{or in  
  \emph{typewriter} style.}
```

You can also emphasize text if it is set in italics, in a sans-serif font, or in typewriter style.