

# L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> Cheat Sheet

## Document classes

**book** Default is two-sided.  
**report** No `\part` divisions.  
**article** No `\part` or `\chapter` divisions.  
**letter** Letter (?).  
**slides** Large sans-serif font.

Used at the very beginning of a document:  
`\documentclass{class}`. Use `\begin{document}` to start contents and `\end{document}` to end the document.

## Common documentclass options

**10pt/11pt/12pt** Font size.  
**letterpaper/a4paper** Paper size.  
**twocolumn** Use two columns.  
**twoside** Set margins for two-sided.  
**landscape** Landscape orientation. Must use `dvips -t landscape`.  
**draft** Double-space lines.  
Usage: `\documentclass[opt, opt]{class}`.

## Packages

**fullpage** Use 1 inch margins.  
**anysize** Set margins: `\marginsize{l}{r}{t}{b}`.  
**multicol** Use  $n$  columns: `\begin{multicols}{n}`.  
**latexsym** Use L<sup>A</sup>T<sub>E</sub>X symbol font.  
**graphicx** Show image: `\includegraphics[width=x]{file}`.  
**url** Insert URL: `\url{http://...}`.  
Use before `\begin{document}`. Usage: `\usepackage{package}`

## Title

`\author{text}` Author of document.  
`\title{text}` Title of document.  
`\date{text}` Date.  
These commands go before `\begin{document}`. The declaration `\maketitle` goes at the top of the document.

## Miscellaneous

`\pagestyle{empty}` Empty header, footer and no page numbers.  
`\tableofcontents` Add a table of contents here.

## Document structure

`\part{title}` `\subsubsection{title}`  
`\chapter{title}` `\paragraph{title}`  
`\section{title}` `\subparagraph{title}`  
`\subsection{title}`  
Use `\setcounter{secnumdepth}{x}` suppresses heading numbers of depth  $> x$ , where **chapter** has depth 0. Use a \*, as in `\section*{title}`, to not number a particular item—these items will also not appear in the table of contents.

## Text environments

`\begin{comment}` Comment (not printed). Requires `verbatim` package.  
`\begin{quote}` Indented quotation block.  
`\begin{quotation}` Like `quote` with indented paragraphs.  
`\begin{verse}` Quotation block for verse.

## Lists

`\begin{enumerate}` Numbered list.  
`\begin{itemize}` Bulleted list.  
`\begin{description}` Description list.  
`\item text` Add an item.  
`\item[x] text` Use  $x$  instead of normal bullet or number. Required for descriptions.

## References

`\label{marker}` Set a marker for cross-reference, often of the form `\label{sec:item}`.  
`\ref{marker}` Give section/body number of marker.  
`\pageref{marker}` Give page number of marker.  
`\footnote{text}` Print footnote at bottom of page.

## Floating bodies

`\begin{table}[place]` Add numbered table.  
`\begin{figure}[place]` Add numbered figure.  
`\begin{equation}[place]` Add numbered equation.  
`\caption{text}` Caption for the body.  
The *place* is a list valid placements for the body. **t**=top, **b**=bottom, **b**=bottom, **p**=separate page, **!**=place even if ugly. Captions and label markers should be within the environment.

## Text properties

### Font face

Command	Declaration	Effect
<code>\textrm{text}</code>	<code>\rmfamily text</code>	Roman family
<code>\textsf{text}</code>	<code>\sffamily text</code>	Sans serif family
<code>\texttt{text}</code>	<code>\ttfamily text</code>	Typewriter family
<code>\textmd{text}</code>	<code>\mdseries text</code>	Medium series
<code>\textbf{text}</code>	<code>\bfseries text</code>	<b>Bold series</b>
<code>\textup{text}</code>	<code>\upshape text</code>	Upright shape
<code>\textit{text}</code>	<code>\itshape text</code>	<i>Italic shape</i>
<code>\textsl{text}</code>	<code>\slshape text</code>	<i>Slanted shape</i>
<code>\textsc{text}</code>	<code>\scshape text</code>	SMALL CAPS SHAPE
<code>\emph{text}</code>	<code>\em text</code>	<i>Emphasized</i>
<code>\textnormal{text}</code>	<code>\normalfont text</code>	Document font
<code>\underline{text}</code>		<u>Underline</u>

The command (`tttt`) form handles spacing better than the declaration (`tttt`) form.

### Font size

<code>\tiny</code>	tiny	<code>\Large</code> Large
<code>\scriptsize</code>	scriptsize	<code>\LARGE</code> LARGE
<code>\footnotesize</code>	footnotesize	
<code>\small</code>	small	<code>\huge</code> huge
<code>\normalsize</code>	normalsize	
<code>\large</code>	large	<code>\Huge</code> Huge

These are declarations and should be used in the form `\small ...`, or without braces to affect the entire document.

## Verbatim text

`\begin{verbatim}` Verbatim environment.  
`\begin{verbatim*}` Spaces are shown as `␣`.  
`\verb!text!` Text between the delimiting characters (in this case ‘!’) is verbatim.

## Justification

Environment	Declaration
<code>\begin{center}</code>	<code>\centering</code>
<code>\begin{flushleft}</code>	<code>\raggedright</code>
<code>\begin{flushright}</code>	<code>\raggedleft</code>

## Miscellaneous

`\linespread{x}` changes the line spacing by the multiplier  $x$ .

## Text-mode symbols

### Symbols

<code>&amp;</code>	<code>\&amp;</code>	<code>—</code>	<code>\_</code>	<code>...</code>	<code>\ldots</code>	<code>•</code>	<code>\textbullet</code>
<code>\$</code>	<code>\\$</code>	<code>⌢</code>	<code>\^{}{}</code>	<code> </code>	<code>\textbar</code>	<code>\</code>	<code>\textbackslash</code>
<code>%</code>	<code>\%</code>	<code>~</code>	<code>\~{}{}</code>	<code>#</code>	<code>\#</code>	<code>§</code>	<code>\S</code>

### Accents

<code>ò</code>	<code>\`o</code>	<code>ó</code>	<code>\'o</code>	<code>ô</code>	<code>\~o</code>	<code>õ</code>	<code>\~o</code>	<code>ö</code>	<code>\=o</code>
<code>ô</code>	<code>\.o</code>	<code>ö</code>	<code>\"o</code>	<code>o</code>	<code>\c o</code>	<code>ö</code>	<code>\v o</code>	<code>ö</code>	<code>\H o</code>
<code>ç</code>	<code>\c c</code>	<code>ç</code>	<code>\d o</code>	<code>ç</code>	<code>\b o</code>	<code>ö</code>	<code>\t oo</code>	<code>œ</code>	<code>\oe</code>
<code>Œ</code>	<code>\OE</code>	<code>æ</code>	<code>\ae</code>	<code>Æ</code>	<code>\AE</code>	<code>å</code>	<code>\aa</code>	<code>Å</code>	<code>\AA</code>
<code>ø</code>	<code>\o</code>	<code>Ø</code>	<code>\O</code>	<code>ı</code>	<code>\l</code>	<code>Ł</code>	<code>\L</code>	<code>ı</code>	<code>\i</code>
<code>j</code>	<code>\j</code>	<code>i</code>	<code>\i</code>	<code>ı</code>	<code>\i</code>				

### Delimiters

<code>‘</code>	<code>\`</code>	<code>“</code>	<code>\`{}</code>	<code>{</code>	<code>\{</code>	<code>[</code>	<code>\[</code>	<code>(</code>	<code>\(</code>	<code>&lt;</code>	<code>\textless</code>
<code>’</code>	<code>\`</code>	<code>”</code>	<code>\`{}</code>	<code>}</code>	<code>\}</code>	<code>]</code>	<code>\]</code>	<code>)</code>	<code>\)</code>	<code>&gt;</code>	<code>\textgreater</code>

### Dashes

Name	Source	Example	Usage
hyphen	—	X-ray	In words.
en-dash	--	1–5	Between numbers.
em-dash	---	Yes—or no?	Punctuation.

## Line and page breaks

`\` Begin new line without new paragraph.  
`\*` Prohibit pagebreak after linebreak.  
`\kill` Don’t print current line.  
`\pagebreak` Start new page.  
`\noindent` Do not indent current line.

## Miscellaneous

`\today` June 26, 2020.  
`\sim$` Prints `~` instead of `\~{}{}`, which makes `~`.  
`~` Space, disallow linebreak (W.J.-Clinton).  
`\@.` Indicate that the `.` ends a sentence when following an uppercase letter.  
`\hspace{l}` Horizontal space of length  $l$  (Ex:  $l = 20\text{pt}$ ).  
`\vspace{l}` Vertical space of length  $l$ .  
`\rule{w}{h}` Line of width  $w$  and height  $h$ .

## Tabular environments

### tabbing environment

`\=` Set tab stop. `\>` Go to tab stop.  
Tab stops can be set on “invisible” lines with `\kill` at the end of the line. Normally `\` is used to separate lines.

tabular environment

```
\begin{array}[pos]{cols}
\begin{tabular}[pos]{cols}
\begin{tabular*}{width}[pos]{cols}
```

tabular column specification

```
l      Left-justified column.
c      Centered column.
r      Right-justified column.
p{width} Same as \parbox[t]{width}.
@{decl} Insert decl instead of inter-column space.
|      Inserts a vertical line between columns.
```

tabular elements

```
\hline      Horizontal line between rows.
\cline{x-y} Horizontal line across columns x through y.
\multicolumn{n}{cols}{text}
          A cell that spans n columns, with cols column
          specification.
```

Math mode

For inline math, use `\(<...>)` or `$(...)$`. For displayed math, use `\[...]` or `\begin{equation}`.

```
Superscriptx  ^{x}      Subscriptx  _{x}
 $\frac{x}{y}$       \frac{x}{y}       $\sum_{k=1}^n$       \sum_{k=1}^n
 $\sqrt[n]{x}$       \sqrt[n]{x}       $\prod_{k=1}^n$       \prod_{k=1}^n
```

Math-mode symbols

```
<= \leq      >= \geq      ≠ \neq      ≈ \approx
× \times      ÷ \div      ± \pm       · \cdot
° \circ      ° \circ      / \prime    ... \cdots
∞ \infty     ¬ \neg      ∧ \wedge  ∨ \vee
⊃ \supset    ∀ \forall     ∈ \in    → \rightarrow
⊂ \subset    ∃ \exists     ∉ \notin ⇒ \Rightarrow
⊆ \subseteq  ∩ \cap      | \mid   ⇔ \Leftrightarrow
â \dot a     â \hat a   ā \bar a   ã \tilde a
α \alpha     β \beta     γ \gamma   δ \delta
ε \epsilon   ζ \zeta     η \eta     ε \varepsilon
θ \theta     ι \iota     κ \kappa   ϑ \vartheta
λ \lambda    μ \mu     ν \nu     ξ \xi
π \pi        ρ \rho     σ \sigma   τ \tau
υ \upsilon   φ \phi     χ \chi     ψ \psi
ω \omega     Γ \Gamma    Δ \Delta   Θ \Theta
Λ \Lambda    Ξ \Xi     Π \Pi     Σ \Sigma
Υ \Upsilon   Φ \Phi     Ψ \Psi     Ω \Omega
```

Bibliography and citations

When using BibTeX, you need to run latex, bibtex, and latex twice more to resolve dependencies.

Citation types

```
\cite{key}      Full author list and year. (Watson and Crick
                  1953)
\citeA{key}     Full author list. (Watson and Crick)
\citeN{key}     Full author list and year. Watson and Crick
                  (1953)
\shortcite{key} Abbreviated author list and year. ?
\shortciteA{key} Abbreviated author list. ?
\shortciteN{key} Abbreviated author list and year. ?
\citeyear{key}  Cite year only. (1953)
All the above have an NP variant without parentheses; Ex.
\citeNP.
```

BibTeX entry types

```
@article      Journal or magazine article.
@book         Book with publisher.
@booklet      Book without publisher.
@conference   Article in conference proceedings.
@inbook       A part of a book and/or range of pages.
@incollection A part of book with its own title.
@misc         If nothing else fits.
@phdthesis    PhD. thesis.
@proceedings  Proceedings of a conference.
@techreport   Tech report, usually numbered in series.
@unpublished  Unpublished.
```

BibTeX fields

```
address      Address of publisher. Not necessary for major
              publishers.
author       Names of authors, of format ....
booktitle    Title of book when part of it is cited.
chapter      Chapter or section number.
edition      Edition of a book.
editor       Names of editors.
institution  Sponsoring institution of tech. report.
journal      Journal name.
key          Used for cross ref. when no author.
month        Month published. Use 3-letter abbreviation.
note         Any additional information.
number       Number of journal or magazine.
organization Organization that sponsors a conference.
pages        Page range (2,6,9--12).
publisher    Publisher's name.
school       Name of school (for thesis).
series       Name of series of books.
title        Title of work.
type         Type of tech. report, ex. "Research Note".
volume       Volume of a journal or book.
year         Year of publication.
Not all fields need to be filled. See example below.
```

Common BibTeX style files

```
abbrv  Standard      abstract  alpha with abstract
alpha  Standard      apa       APA
plain  Standard      unsrt     Unsorted
```

The L<sup>A</sup>T<sub>E</sub>X document should have the following two lines just before `\end{document}`, where `bibfile.bib` is the name of the BibTeX file.

```
\bibliographystyle{plain}
\bibliography{bibfile}
```

BibTeX example

The BibTeX database goes in a file called *file.bib*, which is processed with bibtex file.

```
@String{N = {Na\ture}}
@Article{WC:1953,
  author = {James Watson and Francis Crick},
  title = {A structure for Deoxyribose Nucleic Acid},
  journal = N,
  volume = {171},
  pages = {737},
  year = 1953
}
```

Sample L<sup>A</sup>T<sub>E</sub>X document

```
\documentclass[11pt]{article}
\usepackage{fullpage}
\title{Template}
\author{Name}
\begin{document}
\maketitle

\section{section}
\subsection*{subsection without number}
text \textbf{bold text} text. Some math: $2+2=5$
\subsection{subsection}
text \emph{emphasized text} text. \cite{WC:1953}
discovered the structure of DNA.
```

```
A table:
\begin{table}[!th]
\begin{tabular}{|l|c|r|}
\hline
first & row & data \\
second & row & data \\
\hline
\end{tabular}
\caption{This is the caption}
\label{ex:table}
\end{table}
```

```
The table is numbered \ref{ex:table}.
\end{document}
```