

# 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: `\marginwidth{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`, `h=here`, `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 (`ttt`) form handles spacing better than the declaration (`ttt`) form.

### Font size

<code>\tiny</code>	<small>tiny</small>	<code>\Large</code>	Large
<code>\scriptsize</code>	<small>scriptsize</small>	<code>\LARGE</code>	LARGE
<code>\footnotesize</code>	<small>footnotesize</small>		
<code>\small</code>	<small>small</small>	<code>\huge</code>	huge
<code>\normalsize</code>	<small>normalsize</small>		
<code>\large</code>	<small>large</small>	<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>ó</code>	<code>\.o</code>	<code>ö</code>	<code>\"o</code>	<code>ø</code>	<code>\c o</code>	<code>õ</code>	<code>\v o</code>	<code>õ</code>	<code>\H o</code>
<code>ç</code>	<code>\c c</code>	<code>ø</code>	<code>\d o</code>	<code>ø</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>ı</code>	<code>\j</code>	<code>ı</code>	<code>\~{}</code>	<code>ı</code>	<code>\~{}</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` February 25, 2014.  
`\$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* = 20pt).  
`\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  $\backslash(...\backslash)$  or  $\$...\$$ . For displayed math, use  $\backslash[...\backslash]$  or  $\backslashbegin{equation}$ .

```
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
∪ \cup      ∩ \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 BIB<sub>T</sub>E<sub>X</sub>, 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.
```

## BIB<sub>T</sub>E<sub>X</sub> 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.
```

## BIB<sub>T</sub>E<sub>X</sub> 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 BIB<sub>T</sub>E<sub>X</sub> 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  $\backslash\end{document}$ , where bibfile.bib is the name of the BIB<sub>T</sub>E<sub>X</sub> file.

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

## BIB<sub>T</sub>E<sub>X</sub> example

The BIB<sub>T</sub>E<sub>X</sub> 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}
```