

Get T_EXnical

The Very Basic T_EXniques of L^AT_EX

Use L^AT_EX to make articles, books, formulas and even slideshows!

Zishan Rahman

King's College London
UEL CDT Maker Club Takeover

August 2025

Table of Contents

- 1 **Introductions**
- 2 Set Up
- 3 Writing your first \LaTeX document
- 4 Lists, Figures, Packages and Images
- 5 Math Mode, Special Characters and Quirks
- 6 Basic Bib \TeX
- 7 Beamer for Presentations
- 8 And that's it!

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- Previously completed Computer Science BSc (First Class Honours!) at KCL in 2023 (started September 2020)
- Learnt \LaTeX in 2022-2023 to write my Bachelors thesis
- Have since used \LaTeX to write reports, papers, CVs and presentations

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While \LaTeX sees greater use in academia, particularly with conference and journal papers (it’s especially good for mathematical formulae), it’s so vast and flexible that it can effectively be used for most documents, whether you’re in academia or not, including books, CVs and even presentations!

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- 6 Tables, as they are too complex to type out in L^AT_EX; I will show you a tool you can use to design your own tables and convert to L^AT_EX

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Overleaf is a remote/online \LaTeX editing suite, complete with a distribution (a compiler and some packages). \LaTeX compilers are usually downloaded as part of a larger distribution with many packages (i.e. \TeX Live can be over 5GB in size), so using Overleaf takes the burden off of having to download all of that for the sake of this workshop.

Setting up an Overleaf Account

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- Log in with your Google account.

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A basic \LaTeX document

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\begin{document}
```

```
\end{document}
```

We can then write anything we want in that document:

```
\documentclass{article}
```

```
\begin{document}
```

The quick brown fox jumps over the lazy dog.

```
\end{document}
```


Some basic formatting

I won't go over *everything* to do with formatting text in \LaTeX , but I *will* go over some of the common formatting options you may use:

<code>\textbf{text}</code>	→	text
<code>\textit{text}</code>	→	<i>text</i>
<code>\underline{text}</code>	→	<u>text</u>
<code>\sout{text}</code>	→	text
<code>\TeX{}</code>	→	\TeX
<code>\LaTeX{}</code>	→	\LaTeX
<code>\newline{}</code>	→	Line break
<code>\\</code>	→	Line break
<code>4th</code>	→	4 th
<code>4\$\text{th}\$</code>	→	4 th

More on those dollar signs in that last one later!

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For example:

```
\textbf{Bold} % This command bolds the text.
```

Escaping special symbols

Want to print out a symbol that \LaTeX uses for its syntax? Sure, just escape it!

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For example:

<code>\textbackslash</code>	→	<code>\</code>
<code>\%</code>	→	<code>%</code>
<code>\&</code>	→	<code>&</code>
<code>\\$</code>	→	<code>\$</code>
<code>\#</code>	→	<code>#</code>

Headings

You can also divide your text into chapters, sections, subsections and subsubsections, and \LaTeX will format them accordingly:

```
\chapter{This is a chapter}  
\section{This is a section}  
\subsection{This is a subsection}  
\subsubsection{This is a subsubsection}
```


Creative writing and \LaTeX testing exercise

Now that you know how to set up a basic LaTeX document, it's time to start writing!

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- Any compilation errors and/or warnings you got
- *Optionally*, what you wrote about

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$$\begin{array}{ccc} \text{“} \text{“} & \rightarrow & \text{“} \\ \text{”} & \rightarrow & \text{”} \end{array}$$

(`“` = two backticks)

That's why you're quotes ended up like `”this”` and not `“this”`. Keep this in mind as you continue working with \LaTeX .

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This will render the following list:

- I am an item in a list!
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List exercise

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Spend the next minute or so writing a list of things you like doing.

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Spend the next minute or so writing a list of things you like doing. Hopefully, no weird stuff should happen (i.e. compilation warnings, errors etc.), but if anything weird *does* happen, make a note of it and get back to me afterwards.

Numbered lists

To have your lists *numbered* instead of bulleted, replace `itemize` in your list environment with `enumerate` (in both your `begin` and `end` declarations)

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Spend the next few minutes writing either:

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- A ranking of anything that won't cause offence (from, e.g., best to worst, tallest to highest etc.)

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Again, if anything weird happens when you try to compile it, make a note of it and get back to me afterwards. We will be feeding back on both this and the previous list exercise in the next slide.

Feedback on list and numbered list exercises

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(Very) Basic figures

You start and end a figure like so (notice a pattern here):

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\begin{figure}[h]  
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Which produces:

Stuff...

A figure can be centred using the `\centering` command within the figure itself:

```
\begin{figure}[h]
    \centering
    \textbf{Stuff$\ldots$}
\end{figure}
```

Stuff...

Figure placement

Notice that h ?

Figure placement

Notice that `\h?` \LaTeX can place your figure within your document depending on how you want it:

- `[h]` → As it was placed in the `.tex` file
- `[t]` → Top of page
- `[b]` → Bottom of page
- `[p]` → A separate page for figures (and tables)
Try placing it as it was placed in the `.tex` file,
otherwise place at bottom of page. The above four
figure placement options can likewise be combined
in multiple ways. `[hb]` is an example of just one way.

Captions on figures

A figure can also have a `\caption{text}`:

```
\begin{figure}[h]
  \centering
  \textbf{Stuff$\ldots$}
  \caption{This is stuff!}
\end{figure}
```

Stuff...

Figure: This is stuff!

Labels for figures

You can even use a `\label{fig:label}` to easily refer to it using `\ref{fig:label}` (like this: [2](#)). Make sure the `\label{}` is placed *after* the `\caption{}`.

```
\begin{figure}[h]
    \centering
    \textbf{Stuff$\ldots$}
    \caption{This is stuff!}
    \label{fig:stuff}
\end{figure}
```

Stuff...

Figure: This is stuff!

In articles, you can use `\autoref{fig:label}` to have the text for that reference render to, for example, “Figure 3”.

One more thing on basic figures

There's just *one* more thing that a figure can take great advantage of...

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...**Images!**

One more thing on basic figures

There's just *one* more thing that a figure can take great advantage of...

...**Images!**

To replace our placeholder text (**Stuff...**) in our figure with an image, we will use the `graphicsx` package.

A note about packages

\LaTeX , by itself, is very “bare bones”, so for things like images, hyperlinks and other things that are contained in many documents, we often import “packages” that give us additional commands to use.

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Importing a package in your \LaTeX document is as simple as writing `\usepackage{package}` before your `\begin{document}` statement, and you usually do **not** need to install the package separately, as it will be included in your \LaTeX distribution (such as \TeX Live and the one that Overleaf uses). That’s *why* they’re so huge!

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We’ll be using a number of different packages to add things to our \LaTeX documents, so pay attention and keep your eyes on them!

Adding an image to our figure

First, add the following statement before your `\begin{document}` declaration: `\usepackage{graphicsx}`.

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Then, replace the placeholder text with your image (either use one of your own or download one from the web), like so:

`\includegraphics{your_image}`. You don't need to explicitly define its file type; `graphicsx` accepts most common image types, i.e. PNG, JPG et cetera.

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For example, the image placement in Figure 3 was done like so:

```
\begin{figure}[h]
    \includegraphics[scale=0.13]{me}
    \centering
    \label{fig:me}
\end{figure}
```

Scaling images

Noticed the `[scale=0.13]`?

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Scaling images

Noticed the `[scale=0.13]`? Some \LaTeX commands come with additional configuration options that can be added within a pair of square brackets before the curly ones. The image file I used for Figure 3 is too large to be added to the slide without taking over everything, so I used the `scale` argument to control its size (it takes a multiplier value which it applies to the image size). If *your* image is too large, I'd advise you do the same!

Table of Contents

- 1 Introductions
- 2 Set Up
- 3 Writing your first \LaTeX document
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Math mode

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To create *dedicated* math mode placements, you can use double dollar signs ($\$$ $\$$) at both ends.

For example, $\$ax^2 + bx + c = 0\$$ produces the following:

$$ax^2 + bx + c = 0$$

You can also define a dedicated maths environment as you'd define (e.g.) a document, which will require the `mathtools` package:

```
\usepackage{mathtools}
...
\begin{math}
    ax^{2} + bx + c = 0
\end{math}
```

Math mode - continued

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Special characters within math mode

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```
\begin{math}  
      8 + 9 = 17\newline  
      \therefore 17 - 9 = 8  
\end{math}
```

$8 + 9 = 17$
 $\therefore 17 - 9 = 8$

Special characters within math mode

L^AT_EX allows you to use special symbols using dedicated commands. For example, instead of having to fetch out the “therefore” symbol from the web and copy-pasting it into your document (or entering a Unicode value), you can type in `\therefore` and L^AT_EX will render it easily: \therefore .

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```
\begin{math}
      8 + 9 = 17\newline
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$8 + 9 = 17$
 $\therefore 17 - 9 = 8$

Some symbols can also be entered in *normal* mode (for typing text). For example, `\copyright` renders to ©, in both normal and math mode.

Table of Contents

- 1 Introductions
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A *tiny* bit on BibT_EX

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BibT_EX uses its own file with extension `.bib`. Create one such file in your Overleaf project (ideally, for this workshop, in the same folder as your main `.tex` file). Call it, for example, `references.bib`.

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Then, import the `natbib` package (`biber` is another citation package; we'll use `natbib` for this workshop):

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\usepackage[square,sort,comma,numbers]{natbib}.
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\usepackage[square,sort,comma,numbers]{natbib}.
```

Before you end your document, point BibT_EX to your file. After your text, it will generate a bibliography containing your citations:

```
\bibliographystyle{plain}  
\bibliography{references}
```

Your bibliography

BibT_EX files consist of one or more entries in *this* form:

```
@misc{entryid ,  
  year = {2025},  
  title = {{Get TeXNical}},  
  author = {{Rahman, Zishan}},  
  howpublished = {\url{https://www.example.com}}  
}
```

The `\url{}` command does as explained (when printing the link, it embeds the URL so it can be clicked on and opened). For it to work properly, add `\usepackage{hyperref}` to your preamble.

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Title and Table of Contents

Every book needs a title, author, publication date and list of chapters. The title, author and date you define in your **preamble**, like so:

```
\title{Get \TeX{nical}}  
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```

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As for *making* the title and table of contents show up on your \LaTeX document, that couldn't be any simpler. As soon as you begin your document:

```
\maketitle  
\tableofcontents
```

There are similar commands for glossaries and indexes (which we're not covering how to make today): `\makeglossary` and `\makeindex`.

Exercise: Your first (very short) research article

Time to do some (very basic and not very *guided*) research!

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Research articles are typically quite long and wordy, but for this exercise, I only need you to write a paragraph or two.

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Research articles are typically quite long and wordy, but for this exercise, I only need you to write a paragraph or two. Although your “article” will be short, give it a title and put yourself down as an author. A table of contents wouldn't hurt either.

Table of Contents

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- 2 Set Up
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Table of Contents

- 1 Introductions
- 2 Set Up
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- \TeX StackExchange forum
- Overleaf's *own* \LaTeX tutorials (they're how I learnt \LaTeX back then)
- $\text{r}/\text{\LaTeX}$ Reddit forum
- Tables Generator for \LaTeX
- Wikibooks section listing all of the mathematical symbols you can use in \LaTeX , so that you don't have to remember them all.
- The Comprehensive \LaTeX Symbols List