

Introduction to LaTeX Using Overleaf

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Scientific Writing Course



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Introduction to LaTeX

WHAT is LaTeX?!

LaTeX is a **powerful document preparation system** designed for producing **technical and scientific documents**, especially those containing **mathematical expressions, tables, figures, and references**.

It separates **content from formatting**, ensuring consistency and professional typesetting.

Introduction to LaTeX

WHY LaTeX?!

Price:

Free and open-source; available on all major platforms (Windows, macOS, Linux).

Quality and Aesthetics:

Produces professionally formatted, well-structured documents with consistent style and typography.

Editing, Versioning, and Outputs:

Automatically numbers sections, equations, tables, figures, and references.
Integrates easily with version control and cloud tools such as Overleaf or Git.

Focus on Content:

Authors focus on writing and structure—LaTeX handles the formatting.

Introduction to LaTeX

Get LaTeX?

<https://www.latex-project.org/get/>

Using Overleaf

Overleaf? Why?

- The easy to use, **online**, **collaborative** LaTeX editor.

<https://www.overleaf.com/>

- **Collaboration, Ease of Use, Document history, Work from anywhere**
- A lot of templates to start with:

<https://www.overleaf.com/latex/templates>

Structure of a LaTeX Document

```
\documentclass{article}  
\begin{document}
```

```
\begin{abstract}
```

This is a simple paragraph at the beginning of the document. A brief introduction about the main subject.

```
\end{abstract}
```

We can begin the first paragraph.

This line will start a second paragraph.

I will start the third paragraph and then add `\\` a manual line break which causes this text to start on a new line but remains part of the same paragraph. Alternatively, I can use the `\verb|\newline|\newline` command to start a new line, which is also part of the same paragraph.

```
\end{document}
```

Creating Sections and Subsections

```
\documentclass{article}
```

```
\begin{document}
```

```
\chapter{First Chapter}
```

```
\section{Introduction}
```

This is the first section.

```
\section{Second Section}
```

This is the second section.

```
\subsection{First Subsection}
```

This is subsection

```
\section*{Unnumbered Section}
```

Another subsection

```
\end{document}
```

Adding Comments

```
\documentclass[12pt, letterpaper]{article}
```

```
\title{My first LaTeX document}
```

```
\author{Hubert Farnsworth\thanks{Funded by the Overleaf team.}}
```

```
\date{August 2022}
```

```
\begin{document}
```

```
\maketitle
```

We have now added a title, author and date to our first \LaTeX{} document!

```
% This line here is a comment. It will not be typeset in the document.
```

```
\end{document}
```

Creating Tables

```
\documentclass[12pt, letterpaper]{article}
\title{My first LaTeX document}
\author{Hubert Farnsworth\thanks{Funded by the Overleaf team.}}
\date{August 2022}
\begin{document}
\maketitle
We have now added a title, author and date to our first \LaTeX{} document!
\begin{center}
\begin{tabular}{c c c}
cell1 & cell2 & cell3 \\
cell4 & cell5 & cell6 \\
cell7 & cell8 & cell9
\end{tabular}
\end{center}
\end{document}
```

Including Figures

```
\documentclass{article}  
\usepackage{graphicx} %LaTeX package to import graphics  
\graphicspath{{images/}} %configuring the graphicx package
```

```
\begin{document}
```

The universe is immense and it seems to be homogeneous,
on a large scale, everywhere we look.

```
% The \includegraphics command is  
% provided (implemented) by the  
% graphicx package  
\includegraphics{universe}
```

There's a picture of a galaxy above.

```
\end{document}
```

Making Lists

```
\documentclass{article}
```

```
\begin{document}
```

```
\begin{itemize}
```

```
\item The individual entries are indicated with a black dot, a so-called bullet.
```

```
\item The text in the entries may be of any length.
```

```
\end{itemize}
```

```
\begin{enumerate}
```

```
\item This is the first entry in our list.
```

```
\item The list numbers increase with each entry we add.
```

```
\end{enumerate}
```

```
\end{document}
```

Writing Mathematics

```
\documentclass[12pt, letterpaper]{article}
```

```
\begin{document}
```

In physics, the mass-energy equivalence is stated
by the equation $E=mc^2$, discovered in 1905 by Albert Einstein.

```
\begin{math}
```

$$E=mc^2$$

```
\end{math}
```

 is typeset in a paragraph using inline math mode---as is $E=mc^2$, and so too is $(E=mc^2)$.

```
\end{document}
```

Citations

```
\documentclass[12pt, letterpaper]{article}
```

```
\begin{document}
```

```
\cite{latex2e} is a set of macros built atop \TeX{} \cite{texbook}.
```

```
\bibliographystyle{plain} % We choose the "plain" reference style
```

```
\bibliography{refs} % Entries are in the refs.bib file
```

```
\end{document}
```

AI Features

What AI features are available in Overleaf?

Feature	Description
Error Assist	AI-powered fixes and explanations for LaTeX errors
Writefull language suggestions	Grammar and fluency edits for academic writing
Rewrite tools	Paraphrase, Make concise, Make scientific, Split, Join
Generate tools	Title, Abstract
Summarise and Explain	Shorten and clarify content
TeXGPT	For help writing LaTeX in Overleaf
Equation Generator	Converts plain English into LaTeX math code
Table Generator	Builds LaTeX tables from natural language prompts

Tips and Tricks

Tips and Tricks for Troubleshooting LaTeX

https://www.overleaf.com/learn/latex/Questions/Tips_and_Tricks_for_Troubleshooting_LaTeX

\end{presentation}

For any questions or further information,
please feel free to contact me:
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Additional resources and guides are available at:
<https://www.techlib.cz/en/83998-latex-support-in-english>