

L^AT_EX Crash Course

GRACE Transferable Skills

Dr. Anthea Alberto Dr. Ina Serif

16.05.2023

09:00-13:00

Intro

Welcome!

Agenda - 16.05.2023

9:00-9:30	Introductory round
9:30-9:45	Pros & cons of using L ^A T _E X
9:45-10:45	Structuring documents, syntax etc.
10:45-11:15	Break
11:15-11:45	Typography
11:45-12:15	Exercise
12:15-12:30	Discussing the exercise
12:30-13:00	Typesetting

Materials

You can find all the materials on our [GitHub repository](#).

Not everything is there yet, but you'll have full access to the slides, exercises and solutions by the end of the course.

About Us - Ina Serif



- ▶ Studied History, German and Italian at the University Freiburg (D) (Staatsexamen)
- ▶ PhD in Medieval History about manuscript transmission from University Freiburg (D)
- ▶ Interested in making life and work easier by using computers
- ▶ Currently assistant for Digital and Premodern History at the University Basel

Introductory Round

Please tell us a bit about yourself:

- ▶ Name
- ▶ Field of study
- ▶ Special requirements from your field (equations, specific typography etc.)

What is L^AT_EX?

- ▶ In simple terms: it's a typesetting software
- ▶ Main difference to Word et al.: what you see is not what you get
- ▶ LaTeX uses a plain text editor that later gets compiled into a nicely typeset PDF
- ▶ LaTeX operates with *commands* and *environments* - things you will learn about today

Where and how can I use L^AT_EX?

This course uses [Overleaf](#), an online LaTeX editor, as its main teaching tool.

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Plus, the free version is usually more than enough, particularly for working on solo projects.

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Plus, the free version is usually more than enough, particularly for working on solo projects.

The drawbacks are the online requirement and the fact that some features require a subscription.

Where and how can I use LaTeX?

Many editors exist that allow working with LaTeX while being offline.

I personally use [TeXstudio](#) and [MiKTeX](#) as package manager.



Important: there rarely is “one true way” of doing things in LaTeX. This course aims to get you started and teach you good practices.

Why you should (not) learn to use \LaTeX : a non-comprehensive list

Pro

L^AT_EX...

- ▶ ...focuses on **content**, not layout.

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- ▶ ...makes it easier to include **mathematical notation**.

Big user base

The screenshot shows the TeX Stack Overflow website. The header features the TeX logo and navigation links. The main content area is titled "Explore our questions" and displays a list of questions with their respective details, including votes, answers, and tags. The questions are:

- Centering large column heading above 3 columns (0 votes, 2 answers, 19 views)
- Problem with a tex file in a template (0 votes, 1 answer, 19 views)
- Creating a clickable link to a local file only in source code (0 votes, 0 answers, 11 views)
- How to include the "C" under a line integral while still keeping the limits of integration? (0 votes, 1 answer, 80 views)
- adjust table to fit the page (code from tablesgenerator.com) (1 vote, 3 answers, 767 views)
- how to draw the angle bisector of a triangle (7 votes, 5 answers, 920 views)

On the right side, there is a "Hot Network Questions" section with a list of trending questions, including:

- Do Langford square exist?
- Did Covid vaccines massively increase excess death in Australia in 2022?
- Do mathematicians rely on senses other than vision and hearing?
- Why aren't the radicans on the ISS straight?
- Early 1980s short story - man receives a gift of high technology, but there's a catch (probably published in Asimov's)
- Why use a R&T when engines can windmill?
- Why do people use MD5/SHA-1 instead of BLTs in PWN applications?
- How to replace polyline 2 value equal to Nan in PostGIS?
- Is after the fact consent ever possible or a delusion?
- Proper implementation of signal handler and multithreading (pthread)
- Can a computer program agree to Terms of Service?
- Windows File server heavy cpu usage - Render Farm with many clients reading data at once
- Revisiting a paper written by an editor of the Journal - isn't really anonymous?
- Can the GNU LGPL be removed from a piece of software?
- Isolate specializing a j day: Is it x attempts or a successful casts?
- What does it mean to state my opinions impartially and objectively?
- Isleak ship decides to restart the human race
- Draw the boundary of a polyonino given its' grid
- Making a rubber duck swim in a tabern pond
- Is the minimal volume a topological invariant?
- Why other letter doesn't reflect what was discussed. What should I do?

Screenshot taken on March 29th 2023, 15:35

Contra

We would not be teaching this course if we thought you *shouldn't* actually learn LaTeX.

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Therefore, the next section is not necessarily about arguments *against* learning it, but rather some *caveats*; or things to keep in mind.

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- ▶ **Version control** is not always straightforward.
- ▶ Obstacles to working on a document collaboratively/simultaneously.
- ▶ Potential co-authors might not be familiar with LaTeX.

WYSINWYG

```

58 a non-comprehensive list
59 \end{frame}
60
61 \begin{frame}{Pro}
62 \LaTeX...
63 \vspace{2mm}
64 \begin{itemize}
65 \item ...focuses on content, not layout.
66 \pause
67 \item ...makes bibliographies easier to handle.
68 \pause
69 \item ...has many libraries and packages that make life easier.
70 \pause
71 \item ...is customizable and flexible.
72 \pause
73 \item ...has a big user base and there are many tutorials.
74 \pause
75 \item ...makes it easier to include mathematical notation.
76 \end{itemize}
77 \end{frame}
78
79 \begin{frame}{Big user base}

```

Pro

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What you see is not (directly) what you get.

Version Control

- ▶ For Overleaf free plan: [only last 24 hours](#) available.
- ▶ Syncing with git, GitHub or Dropbox is possible for premium users.
- ▶ For other editors (e.g. TeXstudio), versioning is possible via Dropbox, [GitHub](#) etc.
- ▶ TeXstudio has its own version control system/git integration, but it needs to be set up first.

Working collaboratively

- ▶ Limited options on Overleaf's free plan: **only one collaborator per project**
- ▶ For other editors: similar problems as with version control; no straightforward option to work on a document simultaneously
- ▶ Possibility to use external software to facilitate collaboration

Structuring L^AT_EX documents

Structure of a \LaTeX document

preamble and body

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preamble defines global options for layout, font, bibliography asf.

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minimal example:

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body contains the actual text

minimal example:

```
\documentclass[10pt,a4paper]{article}      ← preamble
\begin{document}
Some meaningful text.                      ← body
\end{document}
```

Structure of a \LaTeX document

Some meaningful text.

Structure of a \LaTeX document

preamble, body and top matter/title page

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minimal example:

```
\documentclass[10pt,a4paper]{article} ← preamble
```

```
\begin{document}
```

```
\title{Title of the document} ← topmatter
```

```
\author{Arthur Dent}
```

```
\date{\today}
```

```
\maketitle
```

```
Some meaningful text. ← body
```

```
\end{document}
```

Structure of a L^AT_EX document

Title of the document

Arthur Dent

April 25, 2023

Some meaningful text.

Structuring L^AT_EX documents

chapters, sections, paragraphs as common document structures

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chapters, sections, paragraphs as common document structures

```
\chapter{Chapter name}
```

```
\section{Header name on level 1}
```

```
\subsection{Header name on level 2}
```

```
\subsubsection{Header name on level 3}
```

```
\paragraph{Paragraph name}
```

```
\subparagraph{Subparagraph name}
```

Structuring L^AT_EX documents

Note: All structural elements will be numbered automatically:

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1 A section of the document

Some meaningful text.

1.1 A subsection

1.1.1 Followed by a subsubsection

More meaningful text.

1.2 Another subsection

A very interesting fact.

2 Back to section level

And even more meaningful text.

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And even more meaningful text.

You can leave subsections unnumbered by using `\setcounter`:

```
\setcounter{secnumdepth}{1}
```

Structuring L^AT_EX documents

You can leave certain chapters/sections unnumbered, using " * ".
This will also not include the section into the table of contents:

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\section*{Acknowledgements}
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More meaningful text.

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And even more meaningful text.

Acknowledgements

This does not need to be numbered.

Structuring \LaTeX documents

As with all default settings in \LaTeX :

You can change the behaviour of everything, e.g. vertical space between headers and text, but think twice if it's necessary.

Structuring L^AT_EX documents

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You can insert comments that explain modifications, or just to make a note to yourself, or to keep a paragraph in a document, but without typesetting it, using "%".

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You can change the behaviour of everything, e.g. vertical space between headers and text, but think twice if it's necessary.

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This is a very good thought. % look up missing reference!

Syntax, commands, environments and packages

How to

- ▶ write commands
- ▶ change default behaviour
- ▶ use environments
- ▶ use packages

Basic syntax and commands

Basic syntax:

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Basic syntax:

`\ + command`

Basic syntax and commands

Basic syntax:

`\ + command`

`\ + command + {mandatory argument}`

Basic syntax and commands

Basic syntax:

`\ + command`

`\ + command + {mandatory argument}`

`\ + command + {mandatory argument} + [optional argument]`

Basic syntax and commands

Basic syntax:

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Basic syntax:

changing font:

`\textit{italic text}` → *italic text*

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Basic syntax:

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inserting a section:

`\section{Section title}` → **1 Section title**

Basic syntax and commands

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changing font:

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defining document class:

`\documentclass[10pt,a4paper]{article}` →

a document with default settings according to class "article", with changes regarding font size and paper format

Environments

environments are used to apply commands to a defined section of a document

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use existing or define new environments

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use existing or define new environments

environments start with `\begin{name}` and end with `\end{name}`

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```
\begin{itemize}
  \item Item 1   → • Item 1
  \item Item 2   • Item 2
\end{itemize}
```

Packages

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packages are called in the preamble:

```
\usepackage[english]{babel}
```

Packages

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```
\usepackage[paper=letterpaper,  
marginparwidth=3in, % Length of section titles  
marginparsep=-3in, % Space between titles and text  
margin=1in, % 1 inch margins  
includemp] % includes the margin notes  
{geometry}
```

Typography primer

- ▶ font style and size
- ▶ quotes, citations, footnotes
- ▶ in-text referencing

Font style and size

font style:

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font style:

```
\underline{This} is a \emph{text} with a \textbf{lot}
of different \textsc{styles}.
```

Font style and size

font style:

`\underline{This}` is a `\emph{text}` with a `\textbf{lot}`
of different `\textsc{styles}`.

This is a *text* with a **lot** of different STYLES.

Font style and size

font size:

Font style and size

font size:

`{\tiny This}` is a `{\Huge text}` with a `{\Large lot}` of
different `{\LARGE sizes}`.

Font style and size

font size:

`{\tiny This}` is a `{\Huge text}` with a `{\Large lot}` of
different `{\LARGE sizes}`.

This is a **text** with a lot of different sizes.

quotes, citations and footnotes

```
\begin{quote}  
  quoted text.\footnote{footnote text}  
\end{quote}
```

¹Adams, Douglas: The Hitchhiker's Guide to the Galaxy. London 1979, p. 42.

quotes, citations and footnotes

```
\begin{quote}  
  quoted text.\footnote{footnote text}  
\end{quote}
```

This is a longer quote from a scientific article that I would like to cite in its whole beauty, including the reference.¹

¹Adams, Douglas: The Hitchhiker's Guide to the Galaxy. London 1979, p. 42.

quotes, citations and footnotes

How to use your reference manager (Zotero, Citavi, ...) with LaTeX to create a bibliography will be covered next session – stay tuned!

in-text referencing

you can mark structural, textual or graphic elements in a document and reference to it

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you can mark structural, textual or graphic elements in a document and reference to it

you can label a section or a figure:

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```
\section{Great section title}\label{great}
```

(figures next session!)

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As discussed in `\ref{great}`, I will now ...

in-text referencing

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(figures next session!)

As discussed in `\ref{great}`, I will now ...

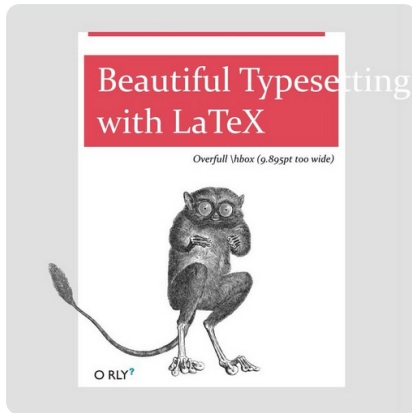
As discussed in chapter 2, I will now ...

Exercise



Astro Joke of the Week @JokesAstro · 23. Apr.

I didn't do a LaTeX joke in a while.



14



133



1.288



40.235



[Diesen Thread anzeigen](#)

documentclass

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This happens with the *documentclass* command.

documentclass also lets you set additional options for your document.

These slides uses a very simple form of document class:

`\documentclass{beamer}`, where what's in the curly brackets indicates the document type.

Frequently used arguments for `\documentclass{}`:

- ▶ article
- ▶ beamer
- ▶ report
- ▶ book or scrbook
- ▶ letter

More options

In addition to type, you can add font size, paper size and format and more to costumize your document.

This is done via square brackets before the curly ones.

For example:

```
\documentclass[12pt,a4paper,oneside]{scrbook}
```

Standard options (taken from [texblog](#)) include:

- ▶ Font size (10pt, 11pt, 12pt...)
- ▶ Paper size and format (a4paper, letterpaper...)
- ▶ Multiple columns (onecolumn, twocolumn)
- ▶ Title page behavior (titlepage, notitlepage)
- ▶ Draft mode (draft)

Most of these options and costumizations can also be done with packages like *geometry*, as you've seen in an earlier slide.

Example:

```
\usepackage[a4paper,top=2cm,bottom=2cm,left=3cm,  
right=3cm,marginparwidth=1.75cm]{geometry}
```

Themes

For presentations like this one, you can use a *theme* for your slides.

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You can find a gallery of themes [here](#). There are many more options, and you can of course make your own.

Language options

Set the language: either within documentclass, or with the *babel* package.

These slides use `\usepackage[english]{babel}`.

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These slides use `\usepackage[english]{babel}`.

Babel supports various languages (documentation [here](#) and [here](#)), but if you require a non-Latin alphabet (like Arabic, Hebrew, Japanese, Mandarin...) the situation is unfortunately a bit more complicated.

You can find an intro on using the [polyglossia](#) package with Overleaf [here](#).