

# Applied $\text{\LaTeX}$ and Markdown for Social Science Research

Laboratorio de Investigación para el Desarrollo del Ecuador  
Syllabus

**Instructor:** Daniel Sánchez, M.A.

**Module length:** 4 hours

**Level:** Introductory

**GitHub repository:** <https://github.com/laboratoriolide/applied-latex>

## 1 Course Description

This short module will introduce the use of the typographic system  $\text{\LaTeX}$ , focusing on its applied use for social science research. Further, the short module introduces Markdown and its use in conjunction with data analysis software.

## 2 Contents

The following is a planned outline of the course. This may change depending on the pace of the class. Lecture materials will be uploaded to the module's GitHub repository.

### 2.1 Lecture 1: Introduction to $\text{\LaTeX}$ and document editing

- Introduction to  $\text{\LaTeX}$ , what is it and what is it for?
- Brief history of  $\text{\LaTeX}$
- Preliminary issues
  - Hardware requirements
  - Installation of  $\text{\TeX}$  distributions
  - Development environments (IDEs: VS Code,  $\text{\TeX}$ Maker, etc.)
  - Overleaf: using  $\text{\LaTeX}$  online
  - Identification of keyboard shortcuts and important keycaps
- $\text{\LaTeX}$  file structure
- Simple commands
- Packages

- Document classes
- Basic document formatting
- Text handling
  - Alignment
  - Lists
  - Titles, covers and abstracts
  - Indexes
  - Headers and footnotes

## **2.2 Lecture 2: Math mode, tables and figures**

- Introduction to math mode
- Basic symbols and greek letters
- Equations
- Matrices
- Basic tables
- Automated table-making: Excel2LaTeX / Overleaf addins
- Including figures and subfigures

## **2.3 Lecture 3: Bibliography management with L<sup>A</sup>T<sub>E</sub>X, complex documents**

- BibTeX and BibL<sup>A</sup>T<sub>E</sub>X
- Zotero integration
- Brief review of Mendeley, Citavi and other integrations
- Citation and bibliography formatting, styling
- Multi-file projects
- Cross-referencing
- Tips for error debugging
- Time-permitting: basic plotting with tikz and pgfplots

## 2.4 Lecture 4: Integration with statistical packages

- RMarkdown/Quarto
  - Basic Markdown syntax
  - R code chunks
  - Output formats
  - Use of L<sup>A</sup>T<sub>E</sub>X
- Presenting data analysis results with R
  - *stargazer*
  - *kableExtra*
  - *modelsummary*
  - *gt* and *flextable*
- Stata
  - *estout*
  - *outreg2*

## 3 Evaluation

Please consult the program’s regulation manual for short module evaluation criteria. All communication will be done through the program’s Slack channel.

### 3.1 Advanced topics (if time allows)

- Presentations with beamer and Quarto
- Advanced document formatting with classes
- Using L<sup>A</sup>T<sub>E</sub>X from Word
- *knitr/sweave*
- Codecogs
- Working with Python/Jupyter

## Bibliography

Frain, John C. Applied L<sup>A</sup>T<sub>E</sub>X for Economists, Social Scientists and Others: TEP Working Paper No. 0214.

Goossens, Michel, and Rahtz, Sebastian, Mittelbach, Frank. *The LaTeX Graphics Companion: Illustrating documents with TeX and PostScript*. 1997.

Goulding, Kevin. `usepackageTikz` for economists.

- Greenber, Harvey J. A Simplified Introduction to LaTeX.
- Griffiths, David F., and Desmond J. Higham. *Learning Latex: Second Edition*. 2nd ed. Philadelphia: Society for Industrial and Applied Mathematics, 2016.
- Kottwitz, Stefan. *LaTeX Beginner's Guide*. 1st ed. Birmingham: Pack Publishing, 2011.
- Krummel, Michelle. LaTeX Tutorials (featuring Texmaker). <https://www.youtube.com/watch?v=0ivLZh9xK1Q&list=PL1D4EAB31D3EBC449>.
- Overleaf. Tutorials. <https://www.overleaf.com/learn/latex/Tutorials>.
- Yu Ko, Chiu. Tikz Cookbook: Diagrams in Economics. [https://play.google.com/books/reader?id=t3ZZDwAAQBAJ&hl=en\\_GB&pg=GBS.PP1](https://play.google.com/books/reader?id=t3ZZDwAAQBAJ&hl=en_GB&pg=GBS.PP1).