

Applied L^AT_EX 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 L^AT_EX, 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 L^AT_EX and document editing

- Introduction to L^AT_EX, what is it and what is it for?
- Brief history of L^AT_EX
- Preliminary issues
 - Hardware requirements
 - Installation of T_EX distributions
 - Development environments (IDEs: VS Code, T_EXMaker, etc.)
 - Overleaf: using L^AT_EX online
 - Identification of keyboard shortcuts and important keycaps
- L^AT_EX 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^AT_EX, complex documents

- BibT_EX and BibL^AT_EX
- 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^AT_EX
- Presenting data analysis results with R
 - *stargazer*
 - *kableExtra*
 - *modelsummary*
 - *gt* and *flextable*
- Stata
 - *estout*
 - *outreg2*

2.5 Advanced topics (if time allows)

- Presentations with beamer and Quarto
- Advanced document formatting with classes
- Using L^AT_EX from Word
- *knitr/sweave*
- Codecogs
- Working with Python/Jupyter

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.

4 Software

We will mostly rely on Overleaf. However, you must install a T_EX distribution on your computer for local demonstrations. I recommend using T_EXLive for Windows, Linux and macOS. An alternative is MiK_TE_X for Windows.

For editing, an integrated development environment (IDE) is recommended. T_EX Maker is a good option for Windows, macOS and Linux.

For Markdown, we will use VS Code and RStudio, both of which are free. You can install the *Markdown All in One* extension for VS Code. Follow the instructions for your *Intro to R* module to install R and RStudio.

5 Communication

All communication will be done through the program's Slack channel. I do not monitor email regularly, so please use Slack for any questions or concerns.

Bibliography

- Frain, John C. Applied L^AT_EX 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>.
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