

Introduction to and Resources for $\text{T}_{\text{E}}\text{X}$ and $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$

$\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ (more generally, the $\text{T}_{\text{E}}\text{X}$ system by Donald Knuth, on which $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ is built) is a powerful software system for typesetting technical documents. It's a markup language, like `html`, meaning you write a `.tex` file in plain text, compile it (for example, with the command `latex file.tex` in Linux), and the result is a `.dvi` (DeVice Independent) file, which can be printed or converted to a `.ps` or `.pdf` format. It is used almost universally by mathematicians and other scientists. The language is relatively easy to learn, in my opinion, and once you've got the hang of it, typing math can be as fast or faster than writing (I have used $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ to take notes in some of my classes, admittedly ones with few drawings). A basic example: to get the expression $f(x) = \frac{1}{2}x^2$, you write `$f(x) = \frac{1}{2} x^2$` (the dollar signs delimit a "math environment"), and $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ takes care of the rest. Creating things like matrices takes a little more work, but not much. Below are some resources, if you'd like to learn about using $\text{T}_{\text{E}}\text{X}$; the first website includes some information and links about how to get $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ on your computer. It's usually included with Linux distributions. Oh, and all the software is *free*, and most is licenced under the GNU project.

- Various Documentation: <http://www.ling.upenn.edu/advice/latex.html>
- " $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$: from quick and dirty to style and finesse":
<http://www.sci.usq.edu.au/staff/robertsa/LaTeX/latexintro.html>
- MiK $\text{T}_{\text{E}}\text{X}$: Windows implementation of $\text{T}_{\text{E}}\text{X}$: <http://www.miktex.org/>
- $\text{T}_{\text{E}}\text{X}$ frequently asked questions: <http://www.tex.ac.uk/cgi-bin/texfaq2html>
- $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ help: <http://www.emerson.emory.edu/services/latex/latex.toc.html>
- CTAN: the Comprehensive $\text{T}_{\text{E}}\text{X}$ Archive Network: <http://www.ctan.org/>

The book I use the most: *Math Into $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$, Third Edition*, by George Grätzer. The first chapter (including "Typing your first article") is available at <http://www.ctan.org/tex-archive/info/mil/mil.pdf>.

Some other related software I've found useful:

- METAPOST, a graphics system that will draw lines, points, curves, etc. Finding clear documentation is difficult: the METAPOST Page has links to documents written by the creator, John Hobby, but I usually use the examples created by Vincent Zoonekynd to figure out what I need to do.

<http://cm.bell-labs.com/who/hobby/MetaPost.html>
<http://zoonek.free.fr/LaTeX/Metapost/metapost.html>
- Arab $\text{T}_{\text{E}}\text{X}$, for typesetting Arabic, Hebrew, and other Middle Eastern languages, by Klaus Legally.

http://www.informatik.uni-stuttgart.de/ifi/bs/research/arab_e.html
- Lilypond, a music notation system by Han-Wen Nienhuys and Jan Nieuwenhuizen. It uses $\text{T}_{\text{E}}\text{X}$ internally (I think) for some typesetting commands, but it has its own syntax. The results really are beautiful, if you write music and like to have it look good. I've also read that it's possible to incorporate Lilypond source into a $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ file and thus have music examples in your `.dvi` files, but I haven't managed to do it, yet.

<http://www.lilypond.org/web/>