Finding, Installing and Using \LaTeX\ Software

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1 What is \LaTeX? 

Basically, a \LaTeX\ document is a text file that contains markup. As long as you like the default formatting, you will not need to format your document manually. A file is formatted as directed by the class file and packages that you use. I will give more details about class files and packages in the next module. \LaTeX\ is a document preparation system based on the \TeX\ typesetting language. The engine converts the \LaTeX\ document into \TeX\ commands, then \TeX\ does the typesetting work.

![Figure 1: \LaTeX\ Document: An Example](image)

\begin{verbatim}
\documentclass{article}
\usepackage{color,graphicx,subfig,geometry,float}
...
\begin{document}
\maketitle
\section{What is \LaTeX?}
Basically, it is a document preparation system based on the \TeX\ typesetting language. ...
\end{document}
\end{verbatim}

Some strengths of \LaTeX\ include: less focus on formatting and more on content; more consistent formatting; and superior and flexible equation presentation. In addition, \TeX\ is fast, stable, extensible, and free (distribution dependent). The article, Technical writing tools for engineers and scientists, by Wright discusses this topic.

- Use publisher Web site to view Technical writing tools for engineers and scientists.
- When off-campus, UA students need a proxied link to Technical writing tools for engineers and scientists.

2 Getting Software

2.1 \TeX\ Distribution

A \TeX\ distribution collection of software that supports the \TeX\ typesetting system. You cannot use \LaTeX\ without installing a \TeX\ distribution. There are versions that are available as freeware, shareware, and commercial. A good starting point for more information about the software needed to create a \LaTeX\ document is the \LaTeX\ Project Web page.

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The T\TeX\ User Group (TUG) is a not-for-profit organization that supports T\TeX\ users interests worldwide (T\TeX\ Users Group (TUG) home page, 2010). A comprehensive list of options including hyperlinks to T\TeX\ distributions is provided by the TUG Web site.

There are different recommendations for different operating systems (OS) and expertise levels. Some Linux OS have a T\TeX\ distribution as part of their install, such as Knoppix. If a T\TeX\ distribution is not packaged with the Linux OS, T\TeX\ Live is often recommended.

2.2 Front End or Editor

You don't have to install a T\TeX\ front end or editor; however, it is much easier to create \LaTeX\ documents if you do. An T\TeX\ editor will call necessary commands, such as \texttt{latex} and \texttt{pdflatex}. Many of them have auto-complete of markup commands and have a spell checker. Users will post their favorite T\TeX\ editors on blogs, forums, and Wikipedia. Many T\TeX\ editors can be downloaded from the TUG Web site. A few T\TeX\ editors will be discussed in this document.

3 Installing Software

3.1 T\TeX\ Distributions

A T\TeX\ distribution must be installed prior to any T\TeX\ editors. The distribution contains all the software that you need to create a \LaTeX\ document. There are installation options with each distribution, where most are straightforward. Most OS are discussed in this section. For additional information about installing, go to the resource tab on the library guide.

3.1.1 Windows

For Windows, you can choose between two T\TeX\ distributions: T\TeX\ Live and MikT\TeX\. Since both function well, the biggest factor in this decision is hard drive space. If you want to use less hard drive space and install packages when you need them, pick MikT\TeX\. If you want to install everything at the repository, pick \TeX\ Live.

Every available package will never be available at any single repository. Regardless of T\TeX\ distribution, you must install class files, packages, and bibliographic style files manually from time to time.

3.1.2 Mac

The MacT\TeX\ install is straightforward using MacT\TeX\-(Year).mpkg. Remove any previous versions because they are very large (directions).

3.1.3 Linux

If you want the latest version of \TeX\ Live, install it from the TUG Web site. If the latest version is not necessary, install the version packaged with the Linux distribution.

If you install \TeX\ Live from the Web site, it is better to download a \TeX\ editor. Often, installing an \TeX\ editor packaged with the OS will install the \TeX\ Live that is packaged with the OS too. You won't be able to rely on the OS to update your \TeX\ distribution when you install from the TUG Web site as well. You will need to use \texttt{tlmgr} to update your packages periodically. To use \texttt{tlmgr} in this case, it is likely that the bin directory for your distribution will need added to the PATH environment variable for the OS.
3.2 Front End or Editor

\LaTeX{} editors will either detect or will need supplied a path to the \TeX{} distribution in order to compile \LaTeX{} documents. This fact is why it is important to install the \TeX{} distribution first.

3.2.1 \TeX{}studio

\TeX{}studio works well on Windows, Mac, and Linux OS. On Windows, the install is straightforward and \TeX{}studio automatically detects a MiK\TeX{} install, which eliminates the need to manually add the path for each command in \TeX{}studio. However, it is possible that the DVI viewer might need configured via Options from the main menu.

If you installed the \TeX{} Live packaged with your Linux Distribution, \TeX{}studio can be installed using the software center or package manager that comes with the OS. If \TeX{}studio is not available via this method, you could use its predecessor \TeX{}maker. Additional information about \TeX{} studio can be found on the resources tab of the library guide.

3.2.2 \TeX{}Shop

\TeX{}Shop is only available for the Mac OS and is part of the Mac\TeX{} install. Spell check is configured with the initial install. If you rather use CocoAspell, it is part of the Mac\TeX{}tras and you can configure it to be used with \TeX{}Shop. For more information, use \TeX{}Shop Help.

4 Downloading Packages

Packages extend the basic \LaTeX{} commands (Kopka & Daly, 2004). Often, they are .sty files, but other necessary files might accompany them. Many publishers offer a class file and it is usually based on an existing \LaTeX{} class. The class file contains global processing information for the document (Kopka & Daly, 2004). For simplicity, “package” will refer to all of these files.

4.1 Installing Files Manually

If you want to install a package that is not in the package repository for your \TeX{} distribution, install the package manually.

4.1.1 Getting the Files

Most packages can be downloaded from the Comprehensive \TeX{} Archive Network (CTAN). It is the authoritative archive of this material. To find packages, search by filename or keyword and download the material. If it is a publisher class file that you seek, check the guide to authors Web pages for the journal. Sometimes the publisher has a more up-to-date copy.

4.1.2 Installing the Files

Always read the documentation with the package because it might provide package specific instructions for installation. In some cases, a zip file is provided containing all the necessary files.

In other cases, there will be an .ins and .dtx file only. A \TeX{} editor can be used to run either the latex or pdflatex command on the .ins file to generate the necessary installation files. Before running, ensure the .ins and .dtx
files are in the same directory. Using latex or pdflatex and the .dtx file will generate the documentation for the package.

With all the necessary files acquired, put them in the proper directory. Create a directory for the package in {local \TeX\ directory}\tex\latex. Most files like .sty, .cls, and .clo files are copied into this directory. If there are .bst files, create a directory for the package in {local \TeX\ directory}\bibtex\bst.

Always refresh the database after installing packages or you will receive an error. For MiKTeX, use the Refresh FNDB button from the MiKTeX Options General Tab (Figure 2a). You can launch this window from All Programs under MiKTeX. Find Maintenance (Admin) from the menu, then select MiKTeX Settings (Admin).

For \TeX\ Live on the Windows OS, the \TeX\ Live Manager could be used. From the \TeX\ Live Manager Menu, select Action then Update Filename Database (Figure 2b). For \TeX\ Live on Linux, use “texhash” or “mktexlsr” commands to update the file name database with administrator privileges.

For Mac\TeX, refreshing the filename database is not necessary – just place the files in the appropriate directory. When installing packages manually the first time, the user must create the directory tree in the Library folder in the user’s home directory.

![Figure 2: Refreshing Database](image)

For more information about manually installing packages with respect to OS, go to the library guide.

5 Documentation and Help

Much \LaTeX\ documentation can be found on the Web. The \LaTeX\ Project Web page links to several good Web sources. The TUG Web site provides recommendations of good Web sites and books about using \LaTeX\.

Many of the suggested books are available through our library using UA Libraries Catalog. Some books will be located in the library and others will be online books from Safari Technical Books and the Electronic Book Center (EBC). Use the interfaces for Safari and the EBC for full-text searching. In addition to full-text searching, these interfaces could aid in locating titles that have not been added to our catalog yet.
Many of the \TeX editors and \TeX distributions provide some \LaTeX documentation. Individual packages have documentation where much can be found on \texttt{CTAN}. This files could be various formats. For packages that are documented well, it will be obvious which file is the documentation. There are a few packages that are not documented well, but you might find comments embedded within the package file itself. In addition to standard documentation, many error messages can be solved by viewing blogs or wikis. The information is not always correct so be critical. Often these sources can either provide a solution or enough insight to find the answer elsewhere.

Need more help? \texttt{Subscribe to the lib-latex listserv} to receive the \LaTeX Workshop schedule and to post questions for me or another UA \LaTeX user to answer!

\section*{References}


\TeX Users Group (TUG) home page. (2010, December). Retrieved from \url{http://www.tug.org}