

Mathematical Methods in Communication

LaTeX - Beginner's Guide

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1 Introduction

This paper will guide you in your first steps in the LaTeX world. This guide includes a short installation guide with links to relevant software and a usage guide with some examples.

2 Installation

Considering a *Microsoft Windows* operating system, you need the following applications installed:

1. *MikTeX* (<http://miktex.org/2.7/setup>) – MiKTeX is a TeX/LaTeX distribution for Microsoft Windows. MiKTeX only provides the tools necessary to prepare documents using the TeX/LaTeX markup language. It does not include a text editor or graphical word processor. Tip: when installing MikTeX, make sure to choose “Install missing packages on-the-fly: Yes”.
2. *Ghostscript* (<http://pages.cs.wisc.edu/~ghost/>) – Ghostscript is a suite of software based on an interpreter for Adobe Systems' PostScript and Portable Document Format (PDF) page description languages. It is needed to compile your TeX/LaTeX documents to PS/PDF files.
3. *TeXnicCenter* (<http://www.texniccenter.org/resources/downloads/29>) – TeXnicCenter is a free open source editor for LaTeX.

A good practice is to install the applications in the order given above.

3 Usage

Once installed, *TeXnicCenter* is the main LaTeX editor and where the compilation is carried out from. To get started with LaTeX, it is best to get familiar with the following guide: <http://tobi.oetiker.ch/lshort/lshort.pdf>. This guide covers everything you need to know about LaTeX and beyond. Here is a quick example for a LaTeX document (try compiling this with *TeXnicCenter*):

```
\documentclass{article}
\begin{document}
Hello World!
\end{document}
```

LaTeX's power lies within the realms of mathematical typesetting. There two ways to typeset mathematical formulae: in-line within a paragraph, or the paragraph can be broken to typeset it separately. Mathematical equations within a paragraph is entered between between \$ and \$. For example, the LaTeX line:

Pythagoras law is \$ a^2 + b^2 = c^2 \$.

results in:

Pythagoras law is $a^2 + b^2 = c^2$. Another example:

Volume of a sphere is \$V_{\text{sphere}} = \frac{4}{3} \pi r^3\$ and of a cube is \$V_{\text{cube}} = a^3\$.

results in:

Volume of a sphere is $V_{\text{sphere}} = \frac{4}{3}\pi r^3$ and of a cube is $V_{\text{cube}} = a^3$.

The mathematical equation environment will break the paragraph and will also number the equation, it is invoked by:

```
\begin{equation}
...
\end{equation}
```

4 Configuring TeXnicCenter – Advanced

Unless *Adobe Acrobat Distiller* is installed, *TeXnicCenter* does not include the right compilation profile (TeX → PS → PDF) configured up. In most cases, only a simple compilation profile, TeX → PDF, is set up. However, one cannot use this profile in order to create PDF file from a TeX source containing .eps figures or to correctly embed the fonts into the PDF.

To configure *TeXnicCenter* properly, apply the steps specified in the guide: [TeXnicCenter configuration guide](#)

5 Further information

For more assistance with installing and configuring LaTeX on your computer, and other general issues, contact:

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For assistance with the lecture scribing template, contact:

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