

# CME 212: Tutorial 1

January 13, 2012

- Quick intro to  $\text{\LaTeX}$

# LaTeX

- LaTeX is a markup language and a typesetting program.
- Unlike wysiwyg; two steps:
  - Write a .tex file (plain text) using any editor.
  - Compile with LaTeX typesetting program to create a .pdf (or .ps, .dvi) document that looks nice.
- Used to typeset articles, books, slides, graphics, etc ...

## Installation + Resources

- If unfamiliar with LaTeX, read chapters 1 and 2 of *“The Not So Short Introduction to L<sup>A</sup>T<sub>E</sub>X<sup>2</sup> $\epsilon$ ”* at
  - <http://tobi.oetiker.ch/lshort/lshort.pdf>
- Install LaTeX links:
  - For mac: <http://www.tug.org/mactex/2011/>,  
<http://mactex-wiki.tug.org>
  - For windows: <http://miktex.org/>
  - Linux: install texlive-latex package
- General help/info:
  - <http://en.wikibooks.org/wiki/LaTeX/>

## Quick Example

- A very simple .tex file looks like this

---

```
\documentclass[12pt]{article}

\begin{document}

    document text goes here ...

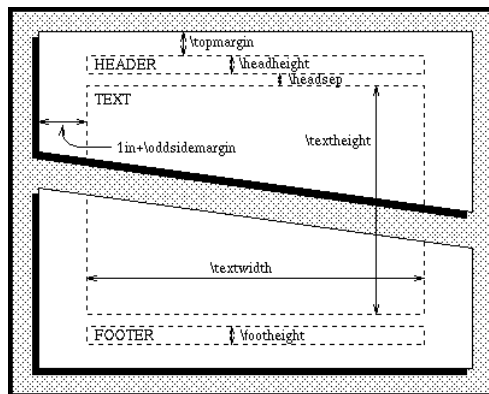
\end{document}
```

---

- To compile we can use the **latex file.tex** to generate file.dvi and then use the **dvips** command to convert to file.ps ( **ps2pdf** converts a .ps file to .pdf )
- More simply use **pdflatex file.tex** to create file.pdf. See distribution specific instructions.

# Document types

- Configuration goes before **begin{document}**



- documentclass: article ( book, slides, etc ... )
- example of editing the page setup:

```
\topmargin 0.75in
```

# Using packages

- To use extra functionality include a package with  
`\usepackage{packagename}`  
before **begin{document}** .
- Some useful packages:  
<http://en.wikibooks.org/wiki/LaTeX/>
  - **graphicx** - include images in documents,
  - **url** - format urls properly,
  - **color** - color segments of text,
  - **amsmath, amsfonts, amssymb** - math equations, symbols,
  - **wrapfig, subfig** - wrap text around an image, subfigures,
  - **enumerate** - customize list numbering,
  - **listings** - include source code,
  - **verbatim** - include unformatted text.

# Document formatting

- Newlines are ignored by LaTeX compiler. Use two back slashes (`\\`) to start new line.
- Blank line indicates start of (i skipped a line here) a new paragraph.
- To start a new section ( or chapter ) we write

```
\section{CME 212}
```

with heading “CME 212”. Use **section\***{ } to avoid numbering the sections. ( **subsection** also available )

- The directives

```
\, \; ~ \hspace{1in}
```

add spaces of different sizes.

- Can add a vertical space with

```
\vspace{2.5in}
```

## Math formulae

- To display  $\int_0^t 2s ds = t^2$  in text:

To display `\int_0^t 2s \, ds = t^2` in text:

- Write

$$\frac{1}{\sqrt{t}}$$

on a separate line:

Write `\[ \frac{1}{\sqrt{t}} \]` on a separate line:

- Use **align** environment to number equations and align equations with **&** directive. **align\*** removes numbering.

$$\hat{x}(t) = |t| \tag{1}$$

$$\dot{y}(t) = \left( \frac{1}{2} + \hat{x}(t) \right) \tag{2}$$

```
\begin{align}
\hat{x}(t) &= |t| \quad \\\
\dot{y}(t) &= \left( \frac{1}{2} + \hat{x}(t) \right)
\end{align}
```

# Tables, figures and captions

- To create a table

1	2	3
4	5	6

```
\begin{center}
  \begin{tabular}{l | c || r | }
    \hline
    1 & 2 & 3 \\ \hline
    4 & 5 & 6
  \end{tabular}
\end{center}
```

- To include an image use package **graphicx** and

```
\begin{figure}[h]
  \centering
  \includegraphics[scale=0.45]{image.png}
  \centering
\end{figure}
```

# Enumerate, Itemize, custom commands

- **Enumerate:**

- ① enum 1

- ② **enum 2**

```
\begin{enumerate}
  \item enum 1
  \item {\bf enum} 2
\end{enumerate}
```

- **Itemize:**

- item 1

- *item 2*

```
\begin{itemize}
  \item item 1
  \item {\it item} 2
\end{itemize}
```

- We can make custom commands by defining them prior to **begin{document}** as

```
\newcommand{\cme}{Large-Scale Computing in Engineering}
```

so that **\cme** generates

Large-Scale Computing in Engineering