A Very Brief LaTeXTutorial

LaTeX is *the* professional way to typeset technical material. No other environment is known that produces such high-quality mathematical expressions. The entire book for ELEC 241 is written in LaTeX, even including many of the graphics and circuit diagrams. Learning this environment is very important for expressing engineering thoughts and designs.

LaTeX, pronounced "la-tech" is entirely text-based, which means you can create a complicated document, like the course notes, with any text editor. To create a well-formatted technical report or book means running the LaTeX system on your text file. Such systems are widely available for free: For any operating system and even on the Web. For ELEC 241, you won't need to produce fancy documents for homework or quizzes. However, the *piazza* question environment does support equations typed in LaTeX, thereby allowing you to be able to ask questions like "Is $\frac{4\pi}{5}$ the right answer?" and my answer of "$\frac{3\pi}{5}$ is more correct" can be easily read. To see your equations before posting a question, click the "Preview Post" link below the text area and to the right.

Here are some simple requirements within LaTeX environments.

- Special commands and functions always begin with a backslash (`\`).
- In *piazza*, LaTeX expressions begin and end with a pair of dollar signs: `$$`.[1] For example, `$$v=Ri$$` becomes $v = Ri$. This is an example of what is known as an inline equation. If you want to produce an expression set apart from the text—a displayed equation, just make sure the equation starts on a new line. So, while `My answer is $$V_{out} = \frac{s}{s+2}V_{in}$$` produces "My answer is $V_{out} = \frac{s}{s+2}V_{in}$," the text
  `My answer is`
  `$$V_{out} = \frac{s}{s+2}V_{in}$$.`
  produces
  My answer is
  $V_{out} = \frac{s}{s+2}V_{in}$.
- Once is equation mode (inside a pair of `$$`), curly braces are used for grouping and are not displayed. See the subscripts and the arguments to `\frac` in the previous example. If you want a curly brace to appear, just use `\{` and `\}` instead. See the exponential function example below.
- Producing special symbols, like the greek letters is easy: `\alpha, \beta, \pi` becomes α, β, π. Upper and lower case Greek letters are easy to obtain: `\gamma, \Gamma` becomes γ, Γ.
- A frequent problem in LaTeX is forgetting to put a space after a symbol's name or to enclose it in curly braces. For example, `2\pift` becomes produces an error message: the command `\pift` is undefined. Better is `2\pi ft`: $2\pi ft$. You can put in as many spaces as you like around the symbols; LaTeX takes care of it: `2 \pi f t` becomes $2\pi f t$.

[1] In LaTeX systems other than *piazza*, beginning and ending an equation with `$$` means a displayed, not an inline equation.

Here are a few examples to get you started.

Special functions	`\sin(2\pi ft), \cos (2\pi ft)`	$\sin(2\pi ft), \cos(2\pi ft)$
	`\log(x), \exp\{j2\pi ft\}`	$\log(x), \exp\{j2\pi ft\}$
	`\tan^{-1}2\pi f`	$\tan^{-1} 2\pi f$
	`\sqrt{2}`	$\sqrt{2}$
Fractions	`\frac{s}{s+2}`	$\frac{s}{s+2}$
Bigger Fractions	`\displaystyle\frac{s}{s+2}`	$\displaystyle\frac{s}{s+2}$
Superscripts/Exponents	`E=mc^2`	$E=mc^2$
Complicated exponents	`e^{j2\pi ft}`	$e^{j2\pi ft}$
Subscripts	`x_2(n)=5, x_{m,n} = 55`	$x_2(n)=5, x_{m,n} = 55$