

1 Basics

**Document Structure**

```
\documentclass[10pt|11pt|12pt]
    {article|book|report}
\title{Title of your Document}
\author{Name 1 \ \ Name 2}
\date{\today}

\begin{document}
    \maketitle
    ...
\end{document}
```

Level No.	LevelName / Sections	Article	Report	Book
-1	\ part{Title}			
0	\ chapter{Title}	N		
1	\ section{Title}			
2	\ subsection{Title}			
3	\ subsubsection{Title}			
4	\ paragraph{Title}			
5	\ subparagraph{Title}			

Blank cell denotes ‘Yes’

**ToC (Table of Contents):** \tableofcontents  
**Hide in ToC:** LevelName\*{...} E.g. \section\*{...}  
**Alternate Title in ToC (Display alias):**  
E.g. \section[Alternative]{Actual Title}

**Hyphen:-**      **En-dash:**\textendash      **Em-dash:**\textemdash

**Special characters**

! @ \* ( ) - + = ? [ ] / \ \$ \& \% \\_ \{ \} \#

**2 Formatting Pages**

**Size:**      \usepackage[<PSize>]{geometry}  
**<PSize>:**    a0paper to a6paper, b0paper to b6paper, legalpaper, executivepaper, etc.

**Margins (Single Side Document):**  
\usepackage[margin=1in]{geometry}  
\usepackage[top=1in,bottom=2in,left=1in,right=1in]{geometry}

**Two Sided Document**  
\documentclass[twoside]{article|report}  
\documentclass{book} %book is 2sided

**Margins (Two Sided Document - Even and Odd):**  
\usepackage[inner=2in,outer=1in]{geometry}

**Page Numbering(Entire Document):** \pagestyle{<Style>}  
**Page Numbering(Current Page):** \thispagestyle{<Style>}  
**<Style>:** empty, plain, headings

**Fancy Header and Footer:**  
\usepackage{fancyhdr}  
\pagestyle{fancy}  
\lhead{...}      \chead{...}      \rhead{...}  
\lfoot{...}      \cfoot{...}      \rfoot{...}

**Fields in Header and Footer:**  
\thepage      : Page number  
\chaptername: Denotes the title ‘Chapter’  
\thechapter : Chapter number  
\thesection : Section number  
\usepackage{lastpage} \pageref{LastPage}:No.ofPages

**Numbering Style:** \pagenumbering  
                      {arabic|roman|Roman|alph|Alph}  
**Set Page Number:**\setcounter{page}{<Number>}

**Landscape (Entire Document):**  
\usepackage[... ,landscape]{geometry}

**Landscape (Specific Part):**  
\usepackage{lscape}      OR      \usepackage{pdflscape}  
\begin{landscape}  
    ...  
\end{landscape}

**Page Breaks:** \pagebreak OR \newpage

**2-Column Page:** \documentclass[... ,twocolumn]{...}

**Multi Column:** \usepackage{multicol}  
                      \begin{multicols}{No. of cols}  
                      ...  
                      ...  
                      \end{multicols}

**New column:** \columnbreak  
**Multi-Column(Spacing):** \setlength{\columnsep}{Xpt}  
**Multi-Column(Rule):** \setlength{\columnseprule}{Xpt}

**Footnotes:** ... \footnote{Text...} ...

3 Text Attributes

Style	Command	Size	10pt	11pt	12pt
Bold	\textbf{...}	tiny	5	6	6
Italics	\textit{...}	scriptsize	7	8	8
Emphasis	\emph{...}	footnotesize	8	9	10
Underline	\underline{...}	small	9	10	10.95
Small Caps	\textsc{...}	normalsize	10	10.95	12
Roman	\textrm{...}	large	12	12	14.4
Sans Serif	\textsf{...}	Large	14.4	14.4	17.28
Typewriter	\texttt{...}	LARGE	17.28	17.28	20.74
Superscript	\textsuperscript{...}	huge	20.74	20.74	24.88
Subscript	\textsubscript{...}	Huge	24.88	24.88	24.88

**Colors:** <https://en.wikibooks.org/wiki/LaTeX/Colors>  
\usepackage{color} %Basic Colors  
\usepackage[dvipsnames]{xcolor} %More colors  
**Single color:** \textcolor{name}{...Text...}  
**Mix with white:** \textcolor{name!Percentage}{Text}  
**Mixture of 2:** \textcolor{name!Percentage!name}{Text}  
**Page color:** \pagecolor{name}

**Text Alignment**  
Certain part: \begin{flushleft|flushright|center}  
                  ...  
                  \end{flushleft | flushright | center}  
Larger part:    \flushleft    \flushright    \centering  
Justify:        \usepackage{ragged2e}    \justify

**Spacing**  
\usepackage{setspace}  
**(Larger part)**  
    \single spacing | \onehalf spacing | \double spacing  
**(Specific Part)**  
    \begin{single space | onehalf space | double space}  
    ...  
    \end{single space | onehalf space | double space}  
**Custom (Larger part)** \spacing{X}  
**Custom (Specific)** \begin{spacing}{X}...\end{spacing}

**Vertical Spacing:** \vspace{Xpt}, \smallskip, \medskip, \bigskip, \vfill  
**Horizontal Spacing:** \hspace{Xpt}    \    \,    \hfill

**Bullets and Numbering**  
\begin{itemize | enumerate | description}  
    \item ...  
    \item[...] ... % Used only with description  
\end{itemize | enumerate | description}

**Change Numering Style**  
\usepackage{enumerate} \begin{enumerate}[A.]

**Change Bullet Style**  
\usepackage{amssymb}  
\renewcommand{\labelitem<Level>}{<Style>}  
<Style>: \blacksquare, \square, \bullet, \cdot, \diamond, -, \*, \circ

## 4 Mathematics

```
\usepackage{amsmath}
Typeset inline $ ... $
Typeset bigger \[ ... \]

Basic symbols
^ _ \times \cos \sin \cup \text{...} \{ ... \}

Fractions: \frac{num}{den}

Bracket size: \Bigg \bigg \Big \big

Summation: \sum_{min}^{max}

Integration: \int_{min}^{max}

Limits: \lim_{...}

Matrices: \begin{<matrixType>}...\end{<matrixType>}
<matrixType>: matrix, pmatrix, bmatrix, Bmatrix,
             vmatrix, Vmatrix

Equation: \begin{equation}...\end{equation}

Multi-line Equation: \begin{align}...\end{align}
                     &=
                     \nonumber
```

## 5 Tables

```
\begin{tabular}{<Alignment>}
...
\end{tabular}
<Alignment>: l, r, c, p{Xcm}
Note the following:
- & denotes new column/cell
- \\ denotes end of the row
- | vertical line
- \hline
- \cline{i-j}
- Dashed border: \usepackage{arydshln}
- : dashed vertical line
- \hdashline[size of dash/space between dash]
- \cdashline[size of dash/space between dash]{i-j}

Merge Columns
\multicolumn{<NumberOfColumns>}{<Alignment>}{...}
Merge Rows
\usepackage{multirow}
\multirow{<NumberOfRows>}{<Width>}{...}
<Width> can be replaced with * or actual width

Spacing: \renewcommand{\arraystretch}{X}

Table(Spanning Multiple Pages): \usepackage{longtable}
\begin{longtable}
...
\end{longtable}

Table Environment: \begin{table}[h|b|t]
                   \begin{tabular}...
                   ...
                   \end{tabular}
                   \caption{...}
\end{table}
\listoftables
```

## 6 Images

```
\usepackage{graphicx}
Original:\includegraphics{file.extn}
Resize:\includegraphics[width|height=Xin]{file.extn}
Scale:\includegraphics[scale=X]{file.extn}
Crop:\includegraphics[clip=true,
                     trim=Lmm Bmm Rmm Tmm]{file.extn}
Rotate:\includegraphics[angle=X]{file.extn}
Border
  Thickness: \setlength{\fboxrule}{Xpt}
  Space: \setlength{\fboxsep}{Xpt}
  Set: \fbox{\includegraphics{...}}
```

```
Use as Figures \begin{figure}[h|b|t]
               \includegraphics ...
               \caption{...}
\end{figure}
\listoffigures
```

```
Subfigure \usepackage{caption}
\usepackage{subcaption}
\begin{figure}[h|b|t]
  \begin{subfigure}{<width>}
    \includegraphics...
    \caption{...}
  \end{subfigure}
  ...
  \caption{...}
\end{figure}
```

## 7 Title, Links

```
Title Page: \begin{titlepage} ... \end{titlepage}
Hyperlinks: \usepackage{hyperref}
             \url{...} OR \href{...}{Alias}
Cross Referencing: \label{KEY}
\ref{KEY}, \nameref{KEY}, \pageref{KEY}
```

## 8 Index

```
\usepackage{imakeidx}
\makeindex[columns=X, title=..., intoc]
Entry: \index{KEY}
Sub-entry: \index{ParentKEY!KEY}
Cross-referencing Key: \index{KEY|see{OtherKEY}}
Print index: \printindex
```

## 9 References (Bibliography)

```
.bib File
@article{KEY,
  author = { },
  title = { },
}
Citing in .tex File: \cite{KEY}
\bibliographystyle{abbrv|alpha|unsrt|acm}
\bibliography{filename.bib}
Including Reference without Citing: \nocite{KEY}
```

## 10 Beamer

```
\documentclass{beamer}
Slides: \begin{frame}[t|c|b]{Frame Title} ...
        \end{frame}
Theme: \usetheme{....}
Color Theme: \usecolortheme{...}
\url{https://hartwork.org/beamer-theme-matrix/}

Blocks: \begin{block}{title} ... \end{block}
        \begin{alertblock}{Title} ... \end{alertblock}
        \begin{example} ... \end{example}
Columns: \begin{columns} ... \end{columns}
        \column{X\textwidth}
Overlay: \pause, <No.->, <No.>, \onslide<No.->,
        \onslide<No.>

Customize themes:
\setbeamercolor{structure}{fg=color}
\setbeamercolor{palette tertiary}{bg=color,
                                     fg=color}
\setbeamercolor{palette secondary}{bg=color,
                                     fg=color}
\setbeamercolor{palette primary}{bg=color,fg=color}
\setbeamercolor{title}{bg=color,fg=color}
\setbeamercolor{frametitle}{bg=color,fg=color}
\setbeamercolor{background canvas}{bg=color}
```

## 11 Important Packages

geometry, lipsum, lscape, pdfscape, multicol, color, xcolor, ragged2e, setspace, enumerate, amssymb, arydshln, multirow, longtable, graphicx, caption, subcaption, imakeidx