

LaTeX Template Commands Explained

Document Class Declaration

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

What it does: Declares the document type and base settings

- `12pt` → Sets default body text to 12-point font (requirement: "Body Text: 12pt font")
- `letterpaper` → Sets paper size to 8.5"×11" (requirement: "8.5"×11" paper")
- `article` → Uses article class (appropriate for academic papers)

Package Imports

Basic Packages

```
\usepackage[utf8]{inputenc}
```

What it does: Allows you to type special characters directly (é, ñ, etc.)

Why needed: For international names and special symbols in citations

```
\usepackage[margin=1in]{geometry}
```

What it does: Sets all page margins to 1 inch

Why needed: Standard academic paper margins (implied requirement)

```
\usepackage{setspace}
```

What it does: Provides commands for controlling line spacing

Why needed: Required for double-spacing requirement: "Body Text: 12pt font, left aligned, double spaced"

```
\usepackage{titlesec}
```

What it does: Allows customization of section headings

Why needed: To create the three specific heading levels with exact fonts, sizes, and alignment

```
\usepackage{tocloft}
```

What it does: Allows customization of Table of Contents formatting

Why needed: To format TOC with dots, indentation for subsections, and no section numbering

```
\usepackage{graphicx}
```

What it does: Enables including images in the document

Why needed: For figures in Findings section and appendices

```
\usepackage{caption}
```

What it does: Allows customization of figure and table captions

Why needed: To format captions as "**Figure 1.** *Description*" (bold number, italic description)

```
\usepackage{fancyhdr}
```

What it does: Provides control over headers and footers

Why needed: To place page numbers at bottom center

```
\usepackage{indentfirst}
```

What it does: Indents the first paragraph after a section heading

Why needed: Requirement: "Indent first line of each paragraph"

```
\usepackage[tile]{appendix}
```

What it does: Provides proper appendix formatting with titles

Why needed: To create properly formatted appendices as required

```
\usepackage{etoolbox}
```

What it does: Provides programming tools for modifying LaTeX behavior

Why needed: For fine-tuning spacing and formatting details

Font Package

```
\usepackage{mathptmx}
```

What it does: Changes the default font to Times New Roman

Why needed: Requirement: "Font, Paper Size: Times New Roman"

Citation Package

```
\usepackage[style=apa, backend=biber]{biblatex}  
\addbibresource{references.bib}
```

What it does:

- Sets up APA citation style
- Specifies biber as the bibliography processor
- Points to your bibliography file

Why needed: Requirement: "APA style, with proper in-text parenthetical citations"

Heading Formats

Level 1 Headings (Main Sections)

```
\titleformat{\section}  
{\normalfont\fontsize{14}{16}\bfseries\centering}  
\{\thesection}{1em}{}
```

Breaking it down:

- `\titleformat{\section}` → Customizes how `\section` commands appear
- `\normalfont` → Uses the document's normal font (Times New Roman)
- `\fontsize{14}{16}` → 14pt font size, 16pt line height
- `\bfseries` → Bold font
- `\centering` → Center alignment

Requirement enforced: "Heading Level 1: Center aligned, bold, 14pt font, Title Case"

Level 2 Headings (Subsections)

```
\titleformat{\subsection}
{\normalfont\fontsize{12}{14}\bfseries\raggedright}
{\thesubsection}{1em}{}
```

Breaking it down:

- `\fontsize{12}{14}` → 12pt font size
- `\bfseries` → Bold
- `\raggedright` → Left alignment

Requirement enforced: "Heading Level 2: Left aligned, bold, 12pt font, Title Case"

Level 3 Headings (Subsubsections)

```
\titleformat{\subsubsection}
{\normalfont\fontsize{12}{14}\bfseries\itshape\raggedright}
{\thesubsubsection}{1em}{}
```

Breaking it down:

- `\bfseries\itshape` → Bold AND italic
- `\raggedright` → Left alignment

Requirement enforced: "Heading Level 3: Left aligned, bold italic, 12pt font, Title Case"

Remove Section Numbering

```
\setcounter{secnumdepth}{0}
```

What it does: Prevents automatic numbering of sections (1, 1.1, 1.1.1, etc.)

Requirement enforced: "Table of Contents: Do not number sections"

Table of Contents Formatting

Control TOC Depth

```
\setcounter{tocdepth}{2}
```

What it does: Only includes sections and subsections in TOC (not subsubsections)

Requirement enforced: "Include only Level 1 and Level 2 section headings" in TOC

TOC Title Formatting

```
\renewcommand{\cfttoctitlefont}{\hfill\fontsize{14}{16}\bfseries}  
\renewcommand{\cftaftertoctitle}{\hfill}  
\renewcommand{\contentsname}{Table of Contents}
```

What it does:

- `\cfttoctitlefont` → Makes "Table of Contents" title 14pt and bold
- `\hfill` commands → Centers the title
- `\contentsname` → Sets the actual text to "Table of Contents"

Requirement enforced: "Center the words 'Table of Contents' at the top of this section (boldfaced, 14-point font)"

Add Dots for Sections

```
\renewcommand{\cftsecleader}{\cftdotfill{\cftdotsep}}
```

What it does: Adds dotted lines between section names and page numbers

Requirement enforced: "Include page numbers connected with dots"

Indent Subsections

```
\setlength{\cftsubsecindent}{2em}
```

What it does: Indents Level 2 headings in the TOC

Requirement enforced: "Indent second order headings" in TOC

Figure and Table Caption Formatting

```
\captionsetup{  
  labelfont=bf,  
  textfont=it,  
  justification=centering,  
  singlelinecheck=false  
}
```

Breaking it down:

- `labelfont=bf` → Makes "Figure 1." bold
- `textfont=it` → Makes the description italic
- `justification=centering` → Centers the caption
- `singlelinecheck=false` → Forces centering even for short captions

Requirement enforced: "Figure & Table Labels: Type and Arabic # in bold, followed by a period, then a concise description in italics. Center aligned, 12pt font"

Spacing Settings

Double Spacing

```
\doublespacing
```

What it does: Sets line spacing to 2.0 throughout the document

Requirement enforced: "Body Text: 12pt font, left aligned, double spaced (not 1.5)"

Paragraph Indentation

```
\setlength{\parindent}{0.5in}
```

What it does: Indents the first line of each paragraph by 0.5 inches

Requirement enforced: "Indent first line of each paragraph"

Remove Extra Paragraph Spacing

```
\setlength{\parskip}{0pt}
```

What it does: Removes extra space between paragraphs

Requirement enforced: "no extra spaces between paragraphs or headings beyond a regular double space"

Page Number Formatting

Setup Page Style

```
\pagestyle{fancy}  
\fancyhf{}  
\renewcommand{\headrulewidth}{0pt}  
\fancyfoot[C]{\thepage}
```

Breaking it down:

- `\pagestyle{fancy}` → Activates the fancyhdr package
- `\fancyhf{}` → Clears all headers and footers
- `\renewcommand{\headrulewidth}{0pt}` → Removes header line
- `\fancyfoot[C]{\thepage}` → Places page number at bottom center

Requirement enforced: Page numbers at bottom center of page

Title Page

```
\begin{titlepage}
\centering\vspace*{2in}
{\fontsize{18}{22}\bfseries\selectfontYour Research Paper Title Here: \A Com
prehensive Analysis\par}
```

Breaking it down:

- `\begin{titlepage}` → Creates a page with no page number
- `\centering` → Centers all content
- `\vspace*{2in}` → Adds 2 inches of vertical space from top
- `\fontsize{18}{22}\bfseries` → 18pt bold font

Requirement enforced: "Paper Title: Center aligned, 18pt font, bold, Title Case"

```
{\fontsize{12}{14}\selectfontStudent Name\Advisor Name\par}
```

Requirement enforced: "Student and advisor name lines: 12pt font, centered"

```
{\fontsize{14}{16}\selectfontUniversity of Chicago\Master of Science in Analy
tics\Capstone Project\par}
```

Requirement enforced: "Rest of lines on title page: 14pt font, centered"

Abstract Formatting

```
\newpage\pagenumbering{roman}
\setcounter{page}{1}
\section{Abstract}
\noindent This abstract provides...
```

Breaking it down:

- `\newpage` → Starts abstract on new page
- `\pagenumbering{roman}` → Switches to Roman numerals (i, ii, iii)

- `\setcounter{page}{1}` → Starts numbering at i
- `\noindent` → Removes paragraph indentation

Requirements enforced:

- "Abstract...should be on its own page"
 - "The page number, Roman numeral 'i,' should be centered at the bottom"
 - "Consists of a maximum of 50-100 words in one paragraph (not indented)"
-

Switching to Arabic Numerals

```
\newpage\pagenumbering{arabic}  
\setcounter{page}{1}  
\section{Introduction}
```

Breaking it down:

- `\newpage` → Starts Introduction on new page
- `\pagenumbering{arabic}` → Switches to Arabic numerals (1, 2, 3)
- `\setcounter{page}{1}` → Starts numbering at 1

Requirement enforced: "The rest of the paper, starting with the Introduction, has Arabic page numbers (1, 2, 3, ...)"

Citations in Text

Narrative Citation

```
\textcite{author2024} showed that...
```

What it does: Produces "Author (2024) showed that..."

When to use: When the author is part of the sentence

Parenthetical Citation

```
Previous research has shown this \parencite{author2023}.
```

What it does: Produces "Previous research has shown this (Author, 2023)."

When to use: When citing at the end of a statement

Requirement enforced: "APA style, with proper in-text parenthetical citations"

Tables

```
\begin{table}[h]
\centering\caption{Table description}
\label{tab:correlations}
\begin{tabular}{lcc}
\hline\textbf{Feature} & \textbf{Correlation} & \textbf{P-value} \\ \hline Feature 1
& 0.XX & < 0.001 \\ \hline\end{tabular}
\end{table}
```

Breaking it down:

- `[h]` → Place table "here" if possible
- `\centering` → Centers the table
- `\caption{}` → Creates the bold/italic label above table
- `\label{}` → Creates reference point for citing table in text
- `{lcc}` → Left-aligned first column, center-aligned other two
- `\hline` → Horizontal lines
- `\textbf{}` → Bold text for headers

Requirement enforced: "The label/description should always be above and on the same page as the figure/table"

Figures

```
\begin{figure}[h]
\centering\includegraphics[width=0.7\textwidth]{distribution.png}
\caption{Distribution of the dependent variable}
\label{fig:distribution}
\end{figure}
```

Breaking it down:

- `[h]` → Place figure “here” if possible
- `\centering` → Centers the figure
- `[width=0.7\textwidth]` → Makes image 70% of text width
- `\caption{}` → Creates the label
- `\label{}` → Creates reference point

To reference in text:

```
Figure \ref{fig:distribution} shows...
```

This produces: “Figure 1 shows...”

Appendices

```
\begin{appendices}  
\section{Additional Data Analysis}  
\label{appendix:a}
```

What it does:

- Automatically labels sections as “Appendix A”, “Appendix B”, etc.
- Automatically prefixes figures/tables (Figure A.1, Table B.2)

Requirement enforced: “Use appendices to present detailed information... numbering them consecutively”

Bibliography

```
\printbibliography[title={References}]
```

What it does:

- Generates bibliography from your .bib file
- Formats it in APA style
- Titles the section “References”

Requirement enforced: "Lists the sources that were consulted and that are relevant for the project in APA format"

Key Commands Summary

Requirement	LaTeX Command
Double spacing	<code>\doublespacing</code>
First-line indent	<code>\setlength{\parindent}{0.5in}</code>
No extra paragraph spacing	<code>\setlength{\parskip}{0pt}</code>
Roman numerals (i, ii, iii)	<code>\pagenumbering{roman}</code>
Arabic numerals (1, 2, 3)	<code>\pagenumbering{arabic}</code>
New page	<code>\newpage</code>
No indent (for Abstract)	<code>\noindent</code>
Center alignment	<code>\centering</code> or <code>\begin{center}...\end{center}</code>
Bold text	<code>\textbf{text}</code>
Italic text	<code>\textit{text}</code>
Font size change	<code>{\fontsize{14}{16}\selectfont text}</code>
Cite author in sentence	<code>\textcite{key}</code>
Cite in parentheses	<code>\parencite{key}</code>
Reference figure/table	<code>\ref{label}</code>

Common Pitfalls and Solutions

Problem: Triple spacing appears

Cause: Extra blank lines in your .tex file

Solution: Remove blank lines between paragraphs in the source code

Problem: Section numbers appear (1, 1.1, etc.)

Cause: `secnumdepth` not set to 0

Solution: Ensure `\setcounter{secnumdepth}{0}` is in preamble

Problem: First paragraph not indented

Cause: Missing `indentfirst` package

Solution: Add `\usepackage{indentfirst}` to preamble

Problem: Citations not appearing

Cause: Need to run biber

Solution: Compile sequence: LaTeX → Biber → LaTeX → LaTeX

Problem: TOC showing subsections

Cause: `tocdepth` not set correctly

Solution: Ensure `\setcounter{tocdepth}{2}` is in preamble

Problem: Figures appearing on wrong pages

Cause: LaTeX float placement algorithm

Solution: Use `[h]` placement option or `\FloatBarrier` command