

COMPLETE TITLE OF THE THESIS



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Department of Electrical, Electronics and Computer Systems

University of Sargodha

Session

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College of Engineering and Technology

University of Sargodha

Sargodha

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Dedicarion (Optional)

CERTIFICATE OF APPROVAL

It is certified that the project titled "**project title**" carried out by **student name 1 (Registration number)** and **student name 2 (Registration number)**, under the supervision of **supervisor name**, at the College of Engineering and Technology, University of Sargodha, is fully adequate in scope and quality as a final year project for the degree of BSc Electrical Engineering.

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ACKNOWLEDGMENTS

This page is intended to thank your supervisor, co-supervisor and all those (students, teachers, TA/SA or any third party) who directly helped you out in the completion of the project/thesis

DECLARATION

It is declared that this is an original piece of my own work, except where otherwise acknowledged in text and references. This work has not been submitted in any form for another degree or diploma at any other university or institution for tertiary education and shall not be submitted in future for obtaining any degree from this or any other university or institution.

Student Name 1 _____

Registration No

Student Name 2 _____

Registration No

August, 2024

ABSTRACT

The abstract is the most important part. Any abstract will be read by ten or twenty times more than any other words in the report. So, to make a positive impression, or just convey information, here's where to really pay attention to writing. The purpose of abstract is not just to tell the reader about what was done: it is to tell him/her what was done in the simplest, most informative way possible. Making an abstract understandable for a non technical person should be the first priority. Discussed below are the basic components of an abstract in any discipline and should be handled in separate paragraphs. First paragraph should be about Motivation/problem statement: Why do you care about the problem? What practical, scientific, theoretical gap is your research/project filling? Methods/procedure/approach: What did you actually do to get your results? (e.g. Designed something, developed your own algorithms/software/techniques, did some survey, worked with some organization etc.) Results/findings/product: As a result of completing the above procedure, what did you learn/invent/create? Conclusion/implications: What are the larger implications of your findings, especially for the problem/gap identified in Motivation/problem statement paragraph?

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List of Acronyms

MATLAB	MATrix LABoratory
NCC	Normalized Cross Correlation
USB	Universal Serial Bus
DC	Direct Current
TF	Transfer Function
SSE	Steady State Error
GUI	Graphical User Interface
CV	Computer Vision

List of Symbols

$\theta(t)$	Shaft angular position of DC motor
$\dot{\theta}(t)$	Shaft angular velocity of DC motor
$i(t)$	Electric current across armature of DC motor

Chapter 1

Introduction to Thesis Writing in L^AT_EX

All the information provided in this section is regarding the format of the report. Read it carefully and make sure that your report is according to the required format. For your ease, the format is not only explained but also has been demonstrated with proper font, font size, style and other formatting requirements.

Once the project work is complete, students are required to submit hard bound copies of the report and a CD containing the MS Word/ PDF file and related software/ code etc of the project in the format explained in this document. The report should be around 60 pages or according to the limits set forth by your supervisor.

This template adheres to all the formatting requirements set by the FYP committee of the Department of Electrical, Electronics, and Computer Systems at the University of Sargodha.

1.1 Why L^AT_EX?

Your thesis could be the longest and most complicated document you'll ever write, which is why it's such a good idea to use L^AT_EX instead of a common word processor. L^AT_EX makes tasks that are difficult and awkward in word processors, far simpler.

When writing something like a thesis it's worth splitting up the document into multiple .tex files. It's also wise to organise the project using folders; therefore, we'll create two new folders, one for all the images used in the project and one for all the .tex files making up the main body of the thesis.

1.1.1 Writing a thesis in L^AT_EX

All packages and formatting are handled in packages .sty. The main .tex file integrates all the .tex files of the template. Additionally, there is a bibliography .bib file that contains all the references used throughout the document. Each folder also includes a subfolder named fig, where images relevant to the specific section or chapter should be stored.

The template is divided into three main sections:

1. Front Matter
2. Chapters
3. Back Matter

1.1.1.1 Front Matter

It contains following tex files

1. `abstract.tex` - Contains the abstract of the thesis.
2. `acknowledgments.tex` - Includes the acknowledgments section.
3. `acronym.tex` - Defines acronyms used in the document.
4. `certificate.tex` - Contains the certificate page.
5. `contents.tex` - Generates the Table of Contents.
6. `copyright.tex` - Contains the copyright statement.
7. `declaration.tex` - Contains the declaration statement.
8. `dedication.tex` - Includes the dedication page.
9. `list of figures.tex` - Generates the List of Figures.
10. `list of tables.tex` - Generates the List of Tables.
11. `symbols.tex` - Lists symbols and their meanings.
12. `titlepage.tex` - Contains the title page of the thesis.

1.1.1.2 Chapters

Each chapter has a separate folder containing a `.tex` file where the LaTeX code for that chapter is written. Additionally, each folder includes a subfolder named `fig`, which contains the figures related to the chapter.

1.1.1.3 Backmatter

It contains following .tex files

1. `appendix.tex` - Contains the appendix material, including any supplementary information or additional data relevant to the thesis.
2. `bibliography.tex` - Manages the bibliography, integrating references from the `bibliography.bib` file and formatting them according to the citation style used in the document.

1.2 Formatting

The single-sided, normal character spaced manuscript is to be arranged as follows:

1.2.1 Submissions Required

A Spiral binding must submitted before the Final Evaluation containing complete Project/Thesis, level of work i.e. BS Project and the year of submission on the prescribed template. Upon a successful final evaluation, you will be required to submit four (04) hard-bound copies of the final project documentation /thesis to your supervisor along with a CD within one week after the final evaluation. Please keep in mind that the hard-binding takes 3-4 days to complete.

1.2.2 Binding

Color of binding should be Black for BSc Electrical Engineering and Maroon for BS Electrical Engineering Technology. Use 80 grams paper; A4 (8.27 x 11.69) and make sure that right paper is selected for both page setup and printer. All copies to be submitted should be printed, photocopies will not be accepted.

1.2.3 Fonts and Spacing

The preferred font is Times New Roman; acceptable font size is 12 for body text, 14+bold for level 3 heading, 16+bold for level 2 heading, 18+bold for chapter heading. Only chapter heading is centered, rest of the headings is left aligned. Different typefaces (e.g., italics) may be used only to show differences in captions and special text. Starting from chapter 1, the line spacing must be 1.5 whereas the spacing both before and after paragraph and/or heading must be 6 points.

For the L^AT_EXtemplate, these formatting requirements have already been addressed.

1.2.4 Chapter Heading

Chapters and section numbering should be same as given. Chapter should begin with ‘CHAPTER XX’ on the first line, in font size 18, centered and bold. Here XX refers to the chapter number. Spacing before ‘Chapter XX’ should be 6 points and after should be 20 points. The following line should contain ‘CHAPTER HEADING TITLE’, all Upper case, font size 18, center aligned and bold. Spacing before ‘CHAPTER HEADING TITLE’ should be 6 points and after should be 20 points.

1.2.5 Section Heading

Font size 16, Bold, Title case, left-aligned, spacing before and after 6 points.

1.2.5.1 Sub-Section Heading

Font size 14, Title case, left-aligned, spacing before and after 6 points.

1.2.5.1.1 Sub-Sub-Section Heading

Font size 12, left-aligned, spacing before and after 6 points.

If (Code has to be included) lstlistings feature can be used it uses default font of arduino ide.

```
1 #include <Arduino.h>
2
3 void setup() {
4   // Initialize serial communication
5   Serial.begin(9600);
6 }
```

1.2.6 Print Quality

Use laser printers or minimum 600 dpi inkjet printers.

1.2.6.1 Margins and Pagination

Left Margin 1.5 inches from the edge of paper. Gutter 0 inches. Top Margin 1 inch from edge of paper. Bottom Margin 1.2 inches from edge of paper. Right Margin 1 inch from edge of paper.

1.2.7 Equations

\LaTeX 's features for typesetting mathematics make it a compelling choice for writing technical documents. This article shows the most basic commands needed to get started with writing maths using \LaTeX .

Writing basic equations in \LaTeX is straightforward, for example: The well known Pythagorean theorem $x^2 + y^2 = z^2$ was proved to be invalid for other exponents. Meaning the next equation has no integer solutions:

$$x^n + y^n = z^n$$

As you see, the way the equations are displayed depends on the delimiter, in this case \[...] and \(...\) .

1.2.7.1 Equation

Another method is to use $\text{\begin{equation}}$ mode this mode offers equation number and allows to label and cite equation as 1.1 by using $\text{\ref{eq label}}$ command

$$E = mc^2 \tag{1.1}$$

1.3 Referencing and Citations

In \LaTeX , all references can be conveniently managed and stored in a 'bibliography.bib' file. They are automatically formatted according to the IEEE style. You can cite these references anywhere in your document using the $\text{\cite{citation_key}}$ command.

All references used in the report should be provided in a separate section after the last chapter and before the appendices. IEEE style of citation should be used in the entire thesis. When referring to the very first reference in the text of the document, put the number of the reference in square brackets. E.g., [1]. All the forthcoming references should be numbered as [2], [3] and so on.

The reference section in the end will then be used to provide the complete reference detail e.g. Author Name, Book, Journal, Paper, Weblink, Location, Printing company, Year etc. In this section, all the references should be sorted in ascending order by the number of the reference.

1.4 Figures and Tables

Figures and tables should be like

Table 1.1: Title of the Table

Header 1	Header 2	Header 3
Row1, Col1	Row1, Col2	Row1, Col3
Row2, Col1	Row2, Col2	Row2, Col3
Row3, Col1	Row3, Col2	Row3, Col3

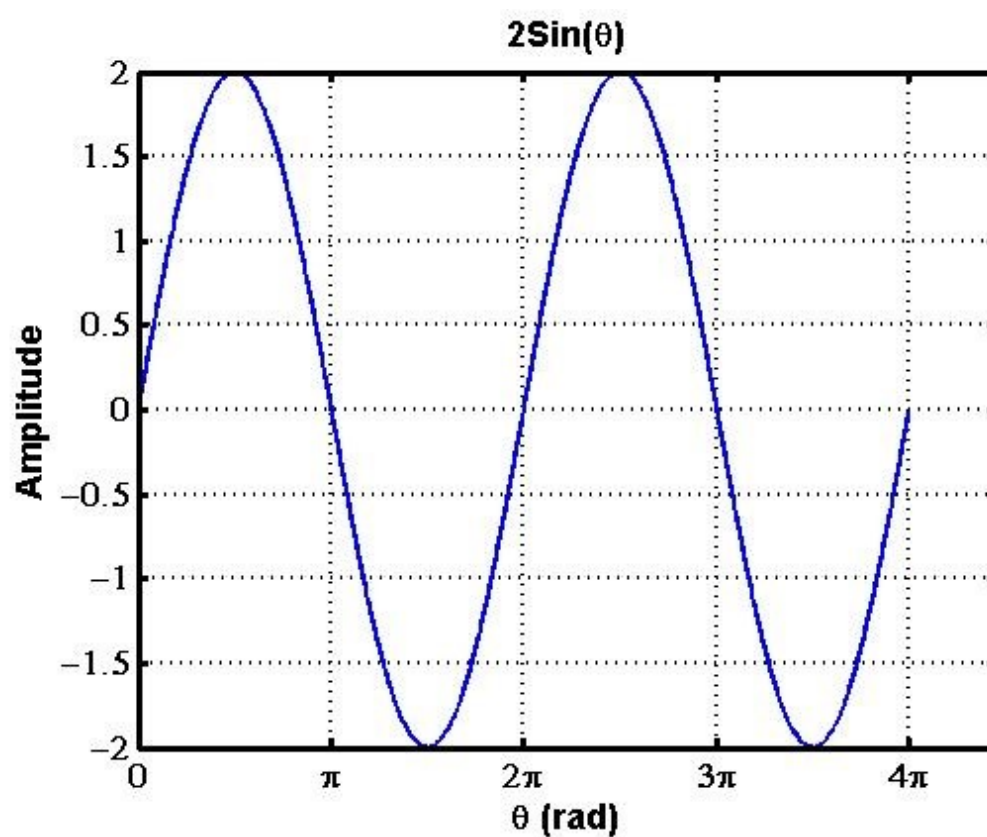


Figure 1.1: Title of the Figure

Figures with high resolution are recommended to avoid blurring (jpeg or eps).

Chapter 2

Literature Review

Chapter 3

System Description

Chapter 4

Results and Discussions

Chapter 5

Conclusions and Future Work

Note: PLO7——— Environment and sustainability

One section here in this chapter must be included to explain how project is affective from perspective of 17 SDGs (sustainable development goals or global goals). The 17 SDGs are: No poverty, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry, innovation and infrastructure, Reduced Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life On Land, Peace, Justice, and Strong Institutions, Partnerships for the Goals. Your FYP project will be helpful in achieving which SDGs goal or goals and with which target level? These levels are mentioned in [1]. Each goal has different levels of targets and levels of indicators for it. Balance for having other goals while improving one goal is important. Some of the known and much discussed conceptual problem areas of the SDGs include: The fact that there are competing and too many goals (resulting in problems of trade-offs), that they are weak on environmental sustainability and that there are difficulties with tracking qualitative indicators. For example, these are two difficult trade-offs to consider: "How can ending hunger be reconciled with environmental sustainability? (SDG targets 2.3 and 15.2) How can economic growth be reconciled with environmental sustainability? (SDG targets 9.2 and 9.4).

The global goals are ambitious, but with great ambition we can achieve great things. To the small organizations advocating for girls to be educated, to the individuals turning plastic waste into something reusable and the businesses innovating to drive change, what we see your part in making this world a better place? If we all take an active part in championing at least one goal without affecting balance for other global goals, our society will be better for all of us, What will your contribution be if your FYP project is taken into consideration?

References

- [1] M. Olivares-Mendez, P. Campoy, C. Martinez, and I. Mondragón, “A pan-tilt camera fuzzy vision controller on an unmanned aerial vehicle,” Dec. 2009, pp. 2879–2884. DOI: [10.1109/IROS.2009.5354576](https://doi.org/10.1109/IROS.2009.5354576).
- [2] T. Weigel, S. Gutmann, M. Dietl, A. Kleiner, and B. Nebel, “Cs freiburg: Coordinating robots for successful soccer playing,” *Robotics and Automation, IEEE Transactions on*, vol. 18, pp. 685–699, Nov. 2002. DOI: [10.1109/TRA.2002.804041](https://doi.org/10.1109/TRA.2002.804041).
- [3] R. Stanciu and P. Oh, “Feedforward control for human-in-the-loop camera systems,” vol. 2004, Jan. 2004, 1–6 Vol.1, ISBN: 0-7803-8232-3. DOI: [10.1109/ROBOT.2004.1307120](https://doi.org/10.1109/ROBOT.2004.1307120).

Websites consulted

- Wikipedia – www.wikipedia.org
- Google Scholar – <https://scholar.google.com/>
- IEEE Explore – <https://ieeexplore.ieee.org/Xplore/guesthome.jsp>

Appendix A

Title

Appendix B

Title