

# Place the Title of your paper here!

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## Abstract

This is a working template for the research paper to be presented at the IOE Graduate Conference. The template has been typeset in L<sup>A</sup>T<sub>E</sub>X. You have to replace certain sections of this template by your content and produce a pdf file as final output. Format for different types of elements that could occur in the paper are already defined in this template. The authors are to strictly follow the style/formatting as defined in this template for consistencies in a single paper and across different papers. The contents of the paper appears in a two column format, with a few exceptions. Your paper should be limited to 8 pages and abstract should not exceed 300 words. Each of the keywords need to be separated by commas as given in the example below.

## Keywords

keyword-1, keyword-2, keyword-3, ...

## 1. Introduction

In the past, the papers for IOE Graduate Conference were submitted as Microsoft Word document. Although standard templates were created for the submission, there used to be a lot of technical problems in the submitted documents. Only a few papers seemed to follow proper guidelines. This resulted in difficulty in compiling the final conference proceeding. To overcome this, the IOE Graduate Conference has been using L<sup>A</sup>T<sub>E</sub>X as the standard and only tool for preparing the manuscript, starting from the year 2015. In word processing softwares like Microsoft Word, it is very likely that people create unorganized document, whereas in typesetting software environment like L<sup>A</sup>T<sub>E</sub>X, one has to create a document in an organized fashion.

On the other hand, L<sup>A</sup>T<sub>E</sub>X is being adapted as the standard tool for producing technical documents by most of the top class universities and institutions. This means that if the graduate students do not learn L<sup>A</sup>T<sub>E</sub>X at the right time, they will poise some limitations on themselves. So, it should be taken as an opportunity to learn L<sup>A</sup>T<sub>E</sub>X. A lot of resources for learning L<sup>A</sup>T<sub>E</sub>X can be found online. It would take 10–20 hours of learning for getting started with L<sup>A</sup>T<sub>E</sub>X and would be beneficial for life long.

## 2. What is L<sup>A</sup>T<sub>E</sub>X?

L<sup>A</sup>T<sub>E</sub>X is a document preparation system for the T<sub>E</sub>X typesetting program. It offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and desktop publishing, including numbering and cross-referencing, tables and figures, page layout, bibliographies, and much more.

- A family of programs designed to produce publication-quality typeset documents.
- Particularly good at working with mathematical symbols.

- WYSIWYM<sup>1</sup> rather than WYSIWYG<sup>2</sup>.

The history of L<sup>A</sup>T<sub>E</sub>X begins with a program called T<sub>E</sub>X. In 1978, a computer scientist by the name of **Donald Knuth** grew frustrated with the mistakes that his publishers made in typesetting his work. He decided to create a typesetting program that everyone could easily use to typeset documents, particularly those that include formulae, and made it freely available.

Knuth's product is an immensely powerful program, but one that does focus very much on small details. A mathematician and computer scientist by the name of Leslie Lamport wrote a variant of T<sub>E</sub>X called L<sup>A</sup>T<sub>E</sub>X that focuses on document structure rather than such details.

## 3. Getting the L<sup>A</sup>T<sub>E</sub>X Software

There are two major standard distributions of L<sup>A</sup>T<sub>E</sub>X:

- TeXLive  
<https://www.tug.org/texlive/>
- MikTeX  
<https://miktex.org/>

These are freely downloadable from the internet. TeXLive works in all the major PC platforms like Windows, Unix, Linux, and Mac. Whereas, MikTeX is for Windows only. When you install these, you also get the TeXWorks editor as your frontend. More than a dozen other frontend GUIs are available for L<sup>A</sup>T<sub>E</sub>X. Some of these are:

- TeXMaker  
<http://www.xmlmath.net/texmaker/>
- TeXnic Center  
<http://www.texniccenter.org/>

<sup>1</sup>What You See Is What You Mean

<sup>2</sup>What You See Is What You Get

## 4. Template Structure

This  $\LaTeX$  template resides on a folder with the following files/folder:

**example.tex** The main  $\LaTeX$  source file of this document (example.pdf). Working Example on using the template with some description.

**article.tex** A minimal alternate of example.tex.

**paperinfo.tex** Contains the abstract and other author information.

**pagenum.tex** Contains the code for starting page number which will be edited during final compilation.

**IOEGC.cls**  $\LaTeX$  class file for managing the styles and formats of the document. Prohibited to edit.

**refs.bib** File for placing the bibliography data in BibTeX format.

**Graphics** Folder for keeping all the final graphics files (.jpg, .png, etc.) used in the document.

## 5. Sections

Paragraphs within a document can be separated just by leaving one blank line between them.

$\LaTeX$  supports section headings upto 3 levels via the following commands:

- `\section{...}`
- `\subsection{...}`
- `\subsubsection{...}`

These have been illustrated properly in section 9 of this example. You can use their starred variants given below to suppress section numbering which has been demonstrated in the *Acknowledgment* section.

- `\section*{...}`
- `\subsection*{...}`
- `\subsubsection*{...}`

## 6. Typesetting Mathematics

$\LaTeX$  has very rich features for typesetting mathematics. Please refer to  $\LaTeX$  and AMSmath manuals or online resources for further information. Here are a few examples.

The formula given in equation 1 can be used to determine the roots of a quadratic equation of the form:

$$ax^2 + bx + c = 0$$

Here,  $a$ ,  $b$ , and  $c$  are constants/coefficients and  $x$  is a variable.

Numbered equation:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (1)$$

Equation without a number

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

## 7. Creating Tables

Table 1 is an example of a simple table in  $\LaTeX$ . To create complex tables, please refer to  $\LaTeX$  manuals or online resources. Use `\begin{table*}` to take up the entire page width. However, the use of tables spanning the entire page width is discouraged as it needs extra caution.

**Table 1:** No. of papers presented in IOEGC

SN	Year	No. of papers
1	2013	42
2	2014	79
3	2015	46
4	2016	49
5	2017	83
	Total	299

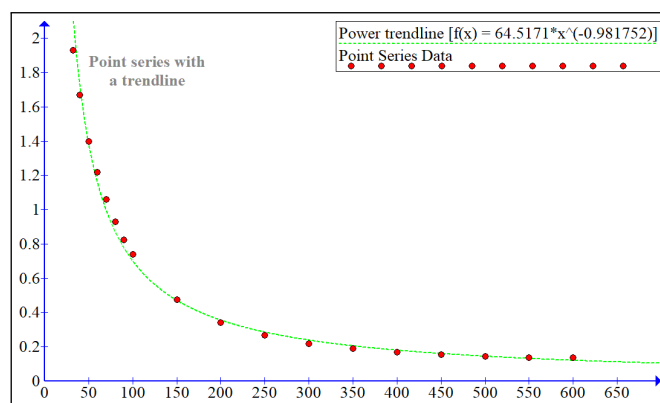
Here are a few online tools to generate latex code for tabular data:

- <https://tablesgenerator.com/>
- <https://www.latex-tables.com/>

## 8. Placing Figures

One can generate technical graphs or diagrams from  $\LaTeX$  also, but this requires another level of expertise. Another alternate is to use R-programming code to generate graphs on the fly thus producing reproducible documents, which requires S-Weave. However, it is very common to include figures generated from other sources or programs. Here are a few examples on placing figures with proper captioning and label for cross referencing. The most suitable format for figure files to produce final output in raster format as pdf are:

1. PNG
2. PDF
3. JPG



**Figure 1:** Figure taking up 95% width of the column



**Figure 2:** Placing a wide picture (Discouraged! as it always appears at the top of a page)

Figure 1 takes up 95% of the width of a column and Figure 2 takes the width of the entire width of the page.

## 9. Lists

### 9.1 Simple Lists

Simple Bulleted and Numbered lists have already been presented in Section 3 and Section 8 respectively.

### 9.2 Nested Lists

Lists can be nested upto three levels in  $\LaTeX$ .

#### 9.2.1 Numbered Nested List

Here is a nested numbered list:

1. Fruits
  - (a) Apple
  - (b) Orange
2. Vegetables
  - (a) Spinach
  - (b) Carrot

#### 9.2.2 Bulleted Nested List

Here is a nested bulleted list:

- Fruits
  - Apple
  - Orange
- Vegetables
  - Spinach
  - Carrot

### 9.2.3 Mixed Nested List

Here is a mixed nested list:

1. Fruits
  - Apple
  - Orange
2. Vegetables
  - Spinach
  - Carrot

### 9.3 Description List

This is for dictionary-like word and description list.

**Word** Definition ...

**Concept** Explanation ...

**Idea** Text ...

## 10. Paragraphs with heading

**Hello** Place your paragraph heading inside the curly braces and your paragraph text here.

## 11. Referencing

The list of references should be produced using BibTeX. The BibTeX entries should be placed in the "refs.bib" file. Please refer BibTeX manuals or online resources on creating bibliography databases using BibTeX and citation. You can easily create bibliography database files using the GUIs like TeXMaker or JabRef. You can even search for BibTeX entries for a majority of publications at Google Scholar in the following url:

`http://scholar.google.com`

Examples: This is citation one[1] and these are two citations in one [2, 3].

## 12. Compilation

Since, this template contains citations and cross referencing along with reference list generated via BibTeX, the  $\LaTeX$  source file should be processed four times in the following sequence to generate the final pdf output.

1. PDFLatex
2. BibTeX
3. PDFLatex
4. PDFLatex

Do not worry, if there is an extra blank page at the end of the paper, this is an intended behavior. It happens to make the number of pages of the paper even, if the paper ends in an odd-numbered page. This is to make sure that every other article always starts with an odd-numbered page.

## 13. Submission

Before submitting the paper, the source file must be compiled without any error. The files that need to be submitted are:

- article.tex (with your content)
- article.pdf (with your content)
- pagenum.tex (as-is)
- paperinfo.tex (with your content)
- refs.bib (with your content)
- IOEGC.cls (as-is)
- Graphics folder (with your content)

All these should be placed in compressed / zipped folder and submitted electronically.

## 14. Review

Your paper will be peer reviewed in blind by expert(s) before the conference. Comments may be provided in the submitted pdf file. You have to re-submit your paper by recompiling the  $\LaTeX$  source file as described in section 12 and submit as described in section 13.

## Still Having Problem?

There are a lot of online tutorials on  $\LaTeX$  available for free download. One of them being *LaTeX Tutorials – A Primer* by Indian  $\TeX$  Users Group [4].

Further, there are websites like `sharelatex.com`, `overleaf.com`, etc., which are very helpful in finding out how to perform a specific task in  $\LaTeX$ .

If you still face technical problems in compiling your document in  $\LaTeX$  using this template, please feel free to contact the primary author of this template via the following email address:

`jayandra@ioe.edu.np`

## Future Enhancements

Lately, there has been a lot of demand for the creation of reproducible documents in research. One of the alternates in producing publication quality reproducible documents is the combination of  $\LaTeX$  and R-programming called S-weave. In the near future, IOEGC is planning to adapt this mechanism to support reproducibility of research documents.

This template has undergone a few iterations of improvement over the past few years and is constantly evolving. Please feel free to send in your valuable comments/suggestions and/or feature requests via email to the primary author of this template.

## Acknowledgments

The authors are thankful to ...

## References

- [1] Leslie Lamport. *LaTeX: A document preparation system, User's guide and reference manual*. Addison-Wesley Professional, 2nd edition, 1994.
- [2] Tobias Oetiker, Hubert Partl, Irene Hyna, and Elisabeth Schlegl. The not so short introduction to latex 2 $\epsilon$ . 2001.
- [3] H Kopka and PW Daly. A guide to  $\{\LaTeX\}$ -document. 1995.
- [4] Indian  $\TeX$  Users Group. *LaTeX Tutorials – A Primer*.