

**Eastern Mediterranean University L^AT_EX Template
for Master and PhD Theses**

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
in
Applied Mathematics and Computer Science

Eastern Mediterranean University
June 2021
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

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ABSTRACT

Use this section to write down the abstract of your thesis. The length of the abstract must *not* exceed 300 words. To keep the abstract short, avoid using too many introductory materials, and keep them for the introduction chapter.

At the end of the abstract, you need to provide 3 to 5 keywords related to the topic of your thesis. Keywords help others interested in your field to find your work more easily. The keywords need to be separated using a comma or a semicolon. Use the same separator for ÖZ as well.

Keywords: keyword1, keyword2, ...

ÖZ

Tezinizin özetini yazmak için bu bölümü kullanın. Özetin uzunluğu 300 kelimeyi *geçmemelidir*. Özeti kısa tutmak için çok fazla giriş materyali kullanmaktan kaçının ve bunları giriş bölümü için saklayın.

Özetin sonunda tezinizin konusu ile ilgili 3 - 5 anahtar kelime sağlamanız gerekmektedir. Anahtar kelimeler, alanınızla ilgilenen diğer kişilerin çalışmanızı daha kolay bulmasına yardımcı olur. Anahtar kelimelerin virgül veya noktalı virgül kullanılarak ayrılmalıdır. ABSTRACT için de aynı noktalama işaretini kullanınız.

Anahtar Kelimeler: anahtar kelime1, anahtar kelime2, ...

... *Dedicated to X*

The current page is using notitlededication for the Dedication page, this option will not print the title of this page. You may use the dedication if you want to include the title for this page. Also you may use any standard font face other than Times New Roman in this page.

ACKNOWLEDGMENTS

In the acknowledgments section, you may express your gratitude towards others who helped you in completing your study and contributed to preparing your thesis.

Keep your acknowledgments section short and avoid going beyond one page.

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LIST OF SYMBOLS AND ABBREVIATIONS

c	Speed of light in a vacuum inertial frame
h	Planck constant
μ	Micro sign
ϕ	Golden ratio
IMU	Inertial Measurement Unit
DMP	Digital Motion Processor
DSP	Digital Signal Processor
GPIO	General Purpose Input/Output
LED	Light-Emitting Diode
QFN	Quad Flat No-leads
SoC	System on Chip
sps	Samples Per Second

Chapter 1

INTRODUCTION

1.1 General Instructions

This \LaTeX template is prepared and suggested by the Institute of the Graduate Studies and Research (IGSR) for the graduating students who are willing to use \LaTeX for their thesis report. The current version is a general template for engineering and mathematics programs. You may add other packages for any special input that is deemed necessary for your own thesis. However, the custom modifications need to be within the boundaries of the formatting guidelines provided by the IGSR. You may inquire your questions during format control sessions [1].

The current document is tested and works best with Overleaf online \LaTeX editor [2]. It has been tested on TeXstudio with Tex Live as well. One important note that you should be keeping in mind while working with this template is that, you always need to put an empty line break or `\par` between your paragraphs or equations but not after the chapters or sections. Otherwise it may not work as intended and it would create some spacing issues.

1.2 Chapters and Sections

Chapters and Section headings must be declared by `\chapter`, `\section`, `\subsection`, and `\subsubsection`. However, `\part` and `\paragraph` commands are not supported.

The title of the chapters should appear in *ALL CAPITALS*, and the title of the sections

can be either *Sentence capital* or *Initial Capital* but not both. All section titles must use justified alignment. Below is an example of `\subsection`, and `\subsubsection`:

1.2.1 Subsection Example with an Unusually Long Title That May Exceed a Single Line

This is an example of how a subsection title should look like.

1.2.1.1 Sub-subsection Example

Here is an example of how a sub-subsection title should look like.

1.3 Paragraphs

Paragraphs can follow one of the following styles. Either indented at the first line with double spacing between every paragraph, or no indent but 24 pt space between every paragraph. The current template only supports the latter.

For paragraphs that end with ‘:’, ‘;’, or ‘,’ the author must reduce the space between the current paragraph and the next paragraph to 0pt with double spacing. For this purpose you may use the `\noskip` command at the end of your paragraph. Do not use the mentioned command if the paragraph is followed by an equation.

For example:

The space between the above line and this paragraph is reduced by `\noskip` command because it is considered a continuation to the previous paragraph.

1.3.1 Quotations

Quotation with more than 40 words or 3 lines need to be put in quotation environment with no paragraph spacing before the quotation. Below is an example of how a quotation should look like:

 Lorem ipsum, or lipsum as it is sometimes known, is dummy text used in laying out print, graphic or web designs. The passage is attributed to an unknown typesetter in the 15th century who is thought to have scrambled parts of Cicero’s

De Finibus Bonorum et Malorum for use in a type specimen book.

If there are several consequent quotations that are related together, you may use `\noskip` between each of them.

1.4 Equations

Equations can be generated using different environments. An empty line is always required before beginning your equation environment. Normally, the space between the equations and between the equation and its previous and next paragraphs is the same as the normal line skip. However, if necessary, the space after can be 24pt when the next paragraph is not related to the current equation. For this purpose, just place an empty line after the equation.

Some examples for equations are given below:

$$G_{\mu\nu} = 8\pi GT_{\mu\nu} \quad (1.1)$$

where G is the Newton constant, $G_{\mu\nu}$.

Equation Array:

$$\begin{aligned} \sum |M_g^{\text{viol}}|^2 &= g_S^{2n-4} (Q^2) N^{n-2} (N^2 - 1) \\ &\times \left(\sum_{i < j} \right) \sum_{\text{perm}} \frac{1}{S_{12}} \frac{1}{S_{12}} \sum_{\tau} c_{\tau}^f. \end{aligned} \quad (1.2)$$

Use the following blocks to create your equations for the best results. If you encountered any issues, please report them to the format check office of the IGSR.

Recommended equation formats are as follows:

Another simple Equation:

$$e^{\pi i} + 1 = 0 \quad (1.3)$$

The beautiful equation (1.3) is known as the Euler equation.

Long equations can be broken in several lines using the `split` environment from `amsmath` package or using multi-line equation environment. For example, see the equation below.

$$p(x) = 3x^6 + 14x^5y + 590x^4y^2 + 19x^3y^3 - 12x^2y^4 - 12xy^5 + 2y^6 - a^3b^3 - 2a^2b^2 + 3x^3y^3 \quad (1.4)$$

Multi-line equation version:

$$\begin{aligned} p(x) = 3x^6 + 14x^5y + 590x^4y^2 + \\ 19x^3y^3 - 12x^2y^4 - 12xy^5 + \\ 2y^6 - a^3b^3 - 2a^2b^2 + 3x^3y^3 \end{aligned} \quad (1.5)$$

Split equation version:

$$\begin{aligned} p(x) = 3x^6 + 14x^5y + 590x^4y^2 + \\ 19x^3y^3 - 12x^2y^4 - 12xy^5 + \\ 2y^6 - a^3b^3 - 2a^2b^2 + 3x^3y^3 \end{aligned} \quad (1.6)$$

Equation using `align`:

$$\begin{aligned} 2x - 5y &= 8 \\ 3x + 9y &= -12 \end{aligned}$$

Equation with nested aligned environment. This is for multi line equations with only one equation number using aligned nested in equation:

$$\begin{aligned} x = y \quad w = z \quad a = b + c \\ 2x = -y \quad 3w = \frac{1}{2}z \quad a = b \\ -4 + 5x = 2 + y \quad w + 2 = -1 + w \quad ab = cb \end{aligned} \quad (1.7)$$

Grouping:

$$2x - 5y = 8$$

$$3x^2 + 9y = 3a + c$$

1.5 Lists

You can use the `\itemize` environments for unordered lists or `\enumerate` command for ordered lists to generate lists. Unordered list example:

- One entry in the list,
- Another entry in the list.

Ordered list example:

1. The labels consists of sequential numbers.
2. The numbers starts at 1 with every call to the `enumerate` environment.

Ordered list example with roman labels:

- i. The labels consists of sequential numbers.
- ii. The numbers starts at i with every call to the `enumerate` environment.

Nested list example:

1. The labels consists of sequential numbers.
 - The individual entries are indicated with a black dot, a so-called bullet.

$$e^{\pi i} + 1 = 0 \tag{1.8}$$

- The text in the entries may be of any length.
2. The numbers starts at 1 with every call to the `enumerate` environment.

Chapter 2

PRELIMINARY SECTIONS, FIGURES, TABLES, AND REFERENCE MATERIALS

For the preliminary sections, please, refer to the comments written before every section environment in the `tex` file.¹ For the list of symbols and abbreviations, the list has to be either sorted by the order of appearance or by alphabetic order. For the latter, symbols must be sorted first and then abbreviations, also, it should be sorted first by the order of English letters then Greek letters.

2.1 Theorems, Definitions, Examples, etc.

Currently, this template has support for remark, definition, proposition, conjecture, theorem, lemma, and corollary sections. You may use the exact wording as mentioned for the environments. For instance, use `\begin{definition}[]` for initiating a definition. Some examples are given below.²

Remark 2.1 (Remark Name (optional)): This is a Remark.

Definition 2.1 (Definition Name (optional)): Let U be the domain of discourse.

$$\tilde{A} = \{(u, \mu_{\tilde{A}(u)}) \mid u \in U\}$$

$$\mu_{\tilde{A}} : U \longrightarrow [0, 1]. \quad (2.1)$$

¹ Comments start with a `%` mark and usually have different color in the code editor.

² If you need a theorem style caption that is not listed here, you may create it yourself by following the appropriate style, or contact IGSR for help.

Proposition 2.1 (Proposition Name (optional)): This is a proposition.

Conjecture 2.1 (Conjecture Name (optional)): This is a Conjecture.

Example 2.1 (Example Name (optional)): This is an example.

Theorem 2.1 (Theorem Name (optional)): This is a theorem.

Proof. Assume this is proof of the theorem. □

Lemma 2.1 (Lemma Name (optional)): This is a lemma.

Corollary 2.1 (Corollary Name (optional)): This is a corollary.

The numbering here is set to be based on the chapter. However, you may change it to be based on the section as well.

2.2 Tables and Figures

Tables and figures are preferred to be on the top of the page unless it is necessary to be between certain paragraphs, or the bottom of the page. However, they should not appear stand alone in the middle of the page with no text, in this case it should be at the top of the page. It is a good practice to define multiple position choices and find the best option for your thesis. Figures have their caption under the figure, but table captions should be above the table.

Table 2.1 is defined to be immediately after its preceding paragraph, while, Table 2.2 and Figure 2.1 are defined to be on top of the page.

Table 2.1: First Table to test placement.

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

Table 2.2: Second Table to test placement.

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

The Space between two tables, table and paragraph should be all 24pt. Meaning it should be the same as the space between two normal paragraphs. The best practice is to copy the codes that are currently used for figures and tables here to create your own content. It is recommended to have figures and tables either at the top or bottom of the page and not between paragraphs. However, if you have to do it please use [!htbp] tag.

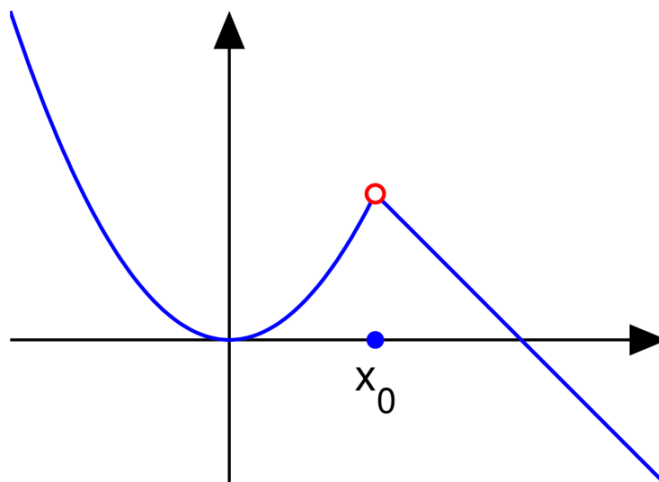


Figure 2.1: Removable discontinuity

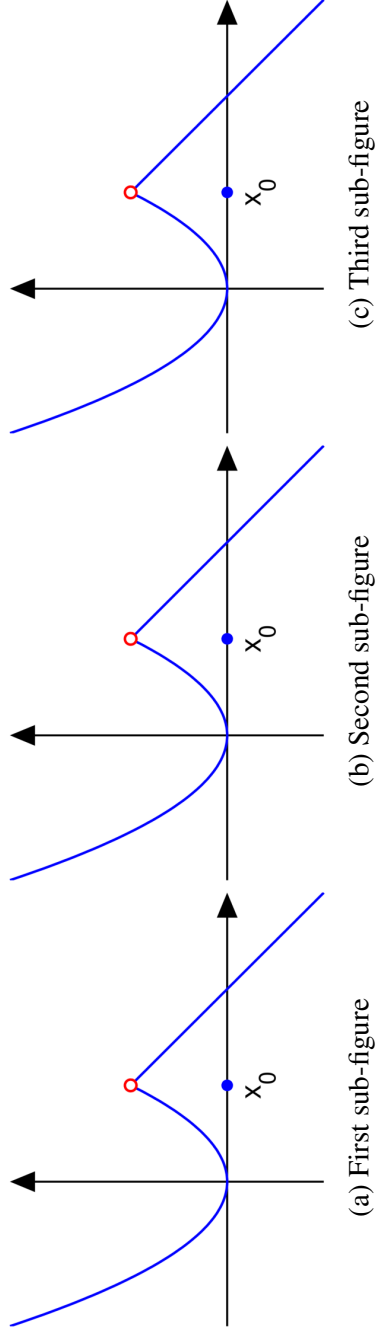


Figure 2.2: Using sub-figures

2.2.1 Sub-figures, Sub-tables, and Landscape Pages

For the figures or tables that include sub-parts you can use `\begin{subfigure}` within figure environment, as shown in this page to create and cite sub-figures, or similarly sub-tables. For instance, you can cite First sub-figure (see Figure 2.2a), and Second sub-figure (Figure 2.2b) or you can cite the whole figure as Figure 2.2.

Notice that this is a landscape page and it has no page number. Sometimes when you have a large figure or a figure with multiple sub-figures that do not fit into the width of the page. In this case you may create a landscape page by using the `\begin{landscape}` environment. Only write down the related content in this page and continue the rest of the thesis outside of the landscape page.

2.3 References

For references you may use any standard style such as APA, IEEE, Chicago, etc. You have to be consistent with the citation and bibliography style throughout your entire thesis.

2.4 Appendices (Optional)

If available, you may use `appendix` or `appendices` environment. The former is used when you have only one appendix, and the former is used when you have multiple appendices which need to be separated as Appendix A, Appendix B, etc.

2.5 Index (Optional)

Similar to appendices, if available, You may create index for your thesis by defining indices using `\index{}` command in a proper place after the indexed word. For example if I use the command `\index{Index}` exactly after the word index, it will appear in the INDEX section with its page number reference.

You can also create a nested index by prefixing the parent index word with ! mark to the child index. For example `\index{Index!Nested Index}` will create a nested index.

REFERENCES

- [1] “Writing your thesis, defence and graduation procedures.” [Online]. Available:
<https://grad.emu.edu.tr/en/academic-issues/theses>
- [2] “Overleaf, online latex editor.” [Online]. Available: <https://www.overleaf.com/>

APPENDICES

Appendix A: Important Notes

You always need to use a blank line between paragraphs to indicate a new paragraph otherwise the compiler will merge the two paragraphs together as one. Refer to the `tex` file for demonstration.

Similarly, for equations you need to have a blank line before and after them, otherwise it will overlap with the previous paragraph.

The first paragraph of every chapter should be written under the chapter declaration without any extra line breaks; otherwise it will cause some spacing issues with the next section.

Contents below are for test only.

Definition A.1: Let U be the domain of discourse

Table A.1: A table for the Appendix A to test the appendix captions.

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

$$G_{\mu\nu} = 8\pi GT_{\mu\nu} \tag{A.1}$$

Appendix B: Second Appendix with yet Another Really Long Title to Test Multi-line Titles

This appendix is solely for testing the table, figure, and equation numbering.

$$G_{\mu\nu} = 8\pi GT_{\mu\nu} \quad (\text{B.1})$$

$$\begin{aligned} \sum |M_g^{\text{viol}}|^2 &= g_S^{2n-4} (Q^2) N^{n-2} (N^2 - 1) \\ &\times \left(\sum_{i < j} \right) \sum_{\text{perm}} \frac{1}{S_{12}} \frac{1}{S_{12}} \sum_{\tau} c_{\tau}^f. \end{aligned} \quad (\text{B.2})$$

$$e^{\pi i} + 1 = 0 \quad (\text{B.3})$$

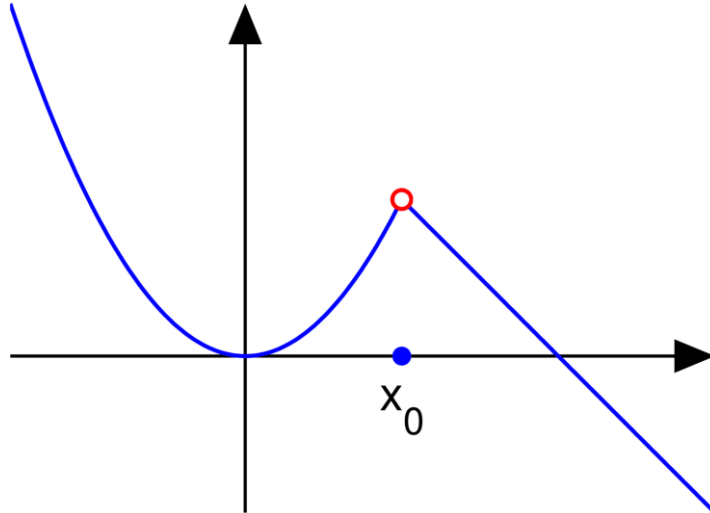


Figure B.1: Removable discontinuity, but it is scaled to 1.5 times the size of the original figure.

Table B.1: Appendix B table.

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

$$p(x) = 3x^6 + 14x^5y + 590x^4y^2 + 19x^3y^3$$

$$- 12x^2y^4 - 12xy^5 + 2y^6 - a^3b^3$$

$$p(x) = 3x^6 + 14x^5y + 590x^4y^2 + 19x^3y^3$$

$$- 12x^2y^4 - 12xy^5 + 2y^6 - a^3b^3$$

Table B.2: Another appendix table.

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

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