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|  |
| Student ID: 11006412  Academic Year: 2024-25 |

# Abstract

Here goes the Abstract in English of your thesis followed by a list of keywords. The Abstract is a concise summary of the content of the thesis (single page of text) and a guide to the most important contributions included in your thesis. The Abstract is the very last thing you write. It should be a self-contained text and should be clear to someone who hasn’t (yet) read the whole manuscript. The Abstract should contain the answers to the main scientific questions that have been addressed in your thesis. It needs to summarize the adopted motivations and the adopted methodological approach as well as the findings of your work and their relevance and impact. The Abstract is the part appearing in the record of your thesis inside POLITesi, the Digital Archive of PhD and Master Theses (Laurea Magistrale) of Politecnico di Milano. The Abstract will be followed by a list of four to six keywords. Keywords are a tool to help indexers and search engines to find relevant documents. To be relevant and effective, keywords must be chosen carefully. They should represent the content of your work and be specific to your field or sub-field. Keywords may be a single word or two to four words.

**To use correctly this template read carefully the tips reported in the introduction.**

**Key-words:** here, the keywords, of your thesis.

# Abstract in italiano

Here goes the Abstract in English of your thesis followed by a list of keywords.

Qui va l’Abstract in lingua italiana della tesi seguito dalla lista di parole chiave.

**Parole chiave:** qui, le parole chiave, in italiano, della tesi.

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# Introduction

This document is intended to be both an example of the Polimi WORD template for Master Theses, as well as a short introduction to its use. It is not intended to be a general introduction to WORD itself, and the reader is assumed to be familiar with the basics of creating and compiling WORD documents.

**Use the English version of Word and to see properly the format use the “Paragraph mark (New Shot, New Paragraph | Scriptwrecked)”.**

***For any doubt refer to:***[*https://support.microsoft.com/en-us/word*](https://support.microsoft.com/en-us/word)[1]

The cover page of the thesis must contain all the relevant information: title of the thesis, name of the Study Program and School, name of the author, student ID number, name of the supervisor, name(s) of the co-supervisor(s) (if any), academic year. Be sure to select a title that is meaningful. It should contain important keywords to be identified by indexer. Keep the title as concise as possible and comprehensible even to people who are not experts in your field. The title must be chosen at the end of your work so that it accurately captures the main subject of the manuscript.

This Layout is featured by 2,5 cm margin both on Left and Right, for a correct bookbinding minds the *Gutter* *(Layout-Margins-Customs Margins-Gutter)* and speak with your bookbinder of trust.

Since a thesis might be a substantial document, it is convenient to break it into chapters. Be sure to be confident with *“Section breaks”* and *“Styles”*. Chapters titles are identified by the *“Heading 1”* and numbered by *“Multilevel list”*. Sub chapters are identified by *“Heading 2”* and so on.

Use the style *“Text”* for the body of the thesis. You can also create a personal style for your own porpoise, please use “Palatino Linotype” as Theme. The *“Headers”* colour is #728FA5.

To start a new chapter: end the previous one with *“Section breaks-odd page”* and the new one will start in an odd page.

The header of the first page of the chapter is different from the even and from the odd page of the chapter itself. In the header, a two rows-table *(with no-borders)* is present: the header in the first page contains the page number *(Insert-Header-Page number)* on the right; the even page contains the page number on the left and the chapter title *(Insert-Quick Parts-Field-StyleRef-Heading 1)* on the right and the chapter number *(Insert-Quick Parts-Field-StyleRef-Heading 1 and Paragraph Number)*. The odd page is the mirror image of the even one’s.

# Chapter one

In this chapter additional useful information are reported.

## Section and subsection

Chapters are typically subdivided into sections and subsections, and, optionally, subsubsections, paragraphs, and subparagraphs. All can have a title, but only sections and subsections are numbered. A new section is created by “*Heading 2*” the sub-sections are created by “*Heading 3*” and so on.

## Equations

This section gives some examples of writing mathematical equations in your thesis.

Maxwell’s equations read:

|  |  |  |
| --- | --- | --- |
|  |  | (1.1a) |
| (1.1b) |
| (1.1c) |
| (1.1d) |

The equations must be labeled and cited in the text, such as Equation (1.1a), Equation (1.1b), Equation (1.1c) and Equation (1.1d) need to be cited in the text. To automatically name the equations and to cite them use “*References, Insert Caption and Cross Reference*”.

The following Equations (1.2), (1.3), (1.4) and (1.5) show the same equation as before, with multiple global references rather than sub-references and without brace:

|  |  |  |
| --- | --- | --- |
|  |  | (1.2) |
|  | (1.3) |
|  | (1.4) |
|  | (1.5) |

Equation (1.6) is the same as before, but with just one label:

|  |  |  |
| --- | --- | --- |
|  |  | (1.6) |

## Figures, Tables and Algorithms

Figures, Tables and Algorithms must contain a Caption that describe their content and must be properly referred in the text.

### Figures

Insert a High-definition image and take care about “*Wrap*” and “*Anchor*” to avoid text sliding. You can also insert the image in a one-row table with *no-borders*.

Remember to cite the Figure 1.1 using “*References-Cross reference-Figure*” after having insert the caption “*References-Insert caption-Figure*”. At the end of the manuscript there is a section dedicated to the List of figures (*Reference-Insert Table of Figures-*choose *figure*).

Logo

Description automatically generated

Figure 1.1: Polimi logo.

Figures can also contain multiple sub-figures (better use *no-border* table) with their own caption and label, e.g. Figure 1.2a and Figure 1.2b.

|  |  |
| --- | --- |
| Logo  Description automatically generated  (a) One PoliMi logo. | Logo  Description automatically generated  (b) Another PoliMi logo. |

Figure 1.2: This is a very long caption that you don’t want to be displayed on the List of Figures.

### Tables

In the following examples of tables are reported. Remember to label and to cite them such as in Table 1.1. At the end of the manuscript there is a section dedicated to the List of Tables (*Reference-Insert Table of figures-*choose *table*). Cell colour HEX #8EA5B6.

Table 1.1: Caption to be displayed in List of Tables.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **column1** | **column2** | **column3** |
| **row1** | 1 | 2 | 3 |
| **row2** | α | β | γ |
| **row3** | alpha | beta | gamma |

You can also consider highlighting selected columns or rows to make tables more readable (Table 1.2 and Table 1.3).

Table 1.2: Highlighting the columns.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **column1** | **column2** | **column3** | **column4** | **column5** | **column6** |
| **row1** | 1 | 2 | 3 | 4 | 5 | 6 |
| **row2** | a | b | c | d | e | f |
| **row3** | α | β | γ | δ | φ | ω |
| **row4** | alpha | beta | gamma | delta | phi | omega |

Table 1.3: Highlighting the rows.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **column1** | **column2** | **column3** | **column4** | **column5** | **column6** |
| **row1** | 1 | 2 | 3 | 4 | 5 | 6 |
| **row2** | a | b | c | d | e | f |
| **row3** | α | β | γ | δ | φ | ω |
| **row4** | alpha | beta | gamma | delta | phi | omega |

### Algorithms

Pseudo-algorithms can be reported as in Algorithm 1.

|  |  |
| --- | --- |
| **Algorithm 1** Name of the Algorithm | |
| 1: | Initial instructions |
| 2: | **for** *for – condition* **do** |
| 3: | Some instructions |
| 4: | **if** *if – condition* **then** |
| 5: | Some other instructions |
| 6: | **end if** |
| 7: | **end for** |
| 8: | **while** *while – condition* **do** |
| 9: | Some further instructions |
| 10: | **end while** |
| 11: | Final instructions |

## Theorems, propositions, and lists

### Theorems

Theorems must be formatted as:

**Theorem 1.1.** *Write here your theorem.*

*Proof.* If useful you can report here the proof.

### Proposition

Propositions must be formatted as:

**Proposition 1.1**. *Write here your proposition.*

### Lists

How to insert itemized lists:

* first item;
* second item;
* third item.

How to insert numbered lists:

1. first item;
2. second item;
3. third item.

## Use of copyrighted material

Each student is responsible for obtaining copyright permissions, if necessary, to include published material in the thesis. This applies typically to third-party material published by someone else.

## Plagiarism

You must be sure to respect the rules on Copyright and avoid an involuntary plagiarism. It is allowed to take other persons’ ideas only if the author and his original work are clearly mentioned. As stated in the Code of Ethics and Conduct, Politecnico di Milano promotes the integrity of research, condemns manipulation and the infringement of intellectual property, and gives opportunity to all those who carry out research activities to have an adequate training on ethical conduct and integrity while doing research. To be sure to respect the copyright rules, read the guides on Copyright legislation and citation styles available at:

<https://www.biblio.polimi.it/en/tools/courses-and-tutorials>

You can also attend the courses which are periodically organized on "Bibliographic citations and bibliography management".

## Bibliography and citations

Your thesis must contain a suitable Bibliography which lists all the sources used or consulted on developing the work. The list of references is placed at the end of the manuscript after the chapter containing the conclusions.

To insert citation using Word: *References-Insert citation-Add a new source*; here you can choose the type of source: website [1], book [2], journal article [3], patent [4], etc.

Fill all the field with the required information (title, author, year, …) and use the style IEEE to have the number in square brackets.

At the end of the manuscript there is a section dedicated to the Bibliography *(References-Bibliography)*.

# Conclusion and future developments

A final chapter containing the main conclusions of your research/study and possible future developments of your work must be inserted in this chapter.

# Bibliography

|  |  |
| --- | --- |
| [1] | D. Alighieri, Comedia, Firenze: Goose Feather Press, 1321. |
| [2] | J. Watson, F. Cric, "Molecular structure of nucleic acids: a structure for deoxyrobose nucleic acid," *Nature,* vol. 171, p. 737–738, 1953. |
| [3] | "https://support.microsoft.com/en-us/word," [Online]. |
| [4] | Prometeus, "Fire". Olympus Patent 1, 300.000 BC. |

# Appendix A

If you need to include an appendix to support the research in your thesis, you can place it at the end of the manuscript. An appendix contains supplementary material (figures, tables, data, codes, mathematical proofs, surveys, …) which supplement the main results contained in the previous chapters.

## Headings

To change the numbering of the headings of the index, select the heading then “*Multilevel list*” and apply the style “A”.

# Appendix B

It may be necessary to include another appendix to better organize the presentation of supplementary material.

## Headings

To change the numbering of the headings of the index, select the heading then “*Multilevel list*” and apply the style “B”.

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# List of symbols

|  |  |  |
| --- | --- | --- |
| **Variable** | **Description** | **SI unit** |
| ***u*** | solid displacement | m |
| ***uf*** | fluid displacement | m |

# Acknowledgments

Here you might want to acknowledge someone.