



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Guideline for Writing Scientific Papers

**Advice for writing Protocols, Internship Reports and
Bachelor and Master Theses**

Chair of Power Electronics and Electromagnetic Compatibility

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1 Basic Structure

If the title of the work is written in English, then the work has to be written in English as well. The same goes for a German title.

The aim of a scientific written report is the objective, purposeful and concise documentation of a task which has been solved thoroughly.

In the following chapters, differences between several document types will be described.

1.1 Title Page

The title page has to contain the following information:

1. University, faculty and chair the work has been compiled at
2. Type of document
3. Complete name of the author
4. Submission date

Furthermore, the following information has to be mentioned according to Table 1.1.

Table 1.1: Layout of the title page according to the type of document

Protocols	Internship Reports	Theses
<ul style="list-style-type: none">• See template	<ul style="list-style-type: none">• University course of the author• Title/summary of the task• Matriculation number• Time period of the internship• Supervisor• Research institution / company	<ul style="list-style-type: none">• University course of the author• Title of the work• Matriculation number• Supervisor• First/ second examiner• Date of issue

Headers and footers are not used on the title page.

1.2 Table of Contents

The table of contents shall be compiled dynamically and according to the regulations of the document software being used. Please note:

- Page numbers in Roman style (I, II, III ...), for the rest of the text Arabic numbering (1,2,3,...)
- A maximum of 3 structure levels (1, 1.1, 1.1.1)

1.3 Complementary Lists before the actual Text

Due to reasons of saving resources, it is not advisable to compile lists of illustrations or tables.

However, a list of abbreviations and symbols shall be compiled. It is up to the author to add personal acknowledgements, which are not a general requirement.

Every list has to be put on a new page. Page numbering has to be made with Roman numbers, in accordance with the table of contents.

1.4 Task

Table 1.2: Listing of the task

Protocols	Internship Reports	Theses
Separate tasks will be provided for every practical training lesson. Every task has to be prepared in advance. Note that proposed solutions listed in the protocol have to be clearly allocated to the respective task.	The task of the internship has to be included before the table of contents. Alternatively, it can be inserted into the introduction. It should be pointed out which tasks have been solved individually and which tasks were solved in a group.	The task, which has been assigned in agreement with the professor and the advisor of the examination office, should be inserted before the table of contents.

1.5 Introduction

With only a small amount of pages (max. 3), an introduction guides the reader to the task of the final paper and tries to relate the topic under investigation to the current state of the art.

The actual content of the work starts with the introduction. Hence, the introduction starts with chapter 1. Arabic numbers (1,2,3,...) have to be used as page numbers. Every new chapter starts on a new page. The chapter always starts at the odd page when printing duplex.

Depending on the type of document, the introduction includes other aspects as well, listed in table 1.3.

Table 1.3: Introduction according to the type of document

Protocols	Internship Reports	Theses
A reference to the tasks related to the practical training lessons is sufficient when writing an introduction. There is no need for a separate introduction here.	The introduction should entail a short presentation of the author's own task structure.	(Current) Sources should highlight the meaning of the problem under investigation. Moreover, a reference to the task should be provided here.

1.6 Continuous Text

The continuous text includes all information which was essential for solving the task. A rough structure could look like this:

Table 1.4: Structure proposal according the type of document

Protocols	Internship Reports	Theses
<ul style="list-style-type: none"> • Tasks for preparation • Test procedure • Test evaluation 	<ul style="list-style-type: none"> • Introduction • Documentation of tasks • Critical discussion • Subjective summary 	<ul style="list-style-type: none"> • Introduction • Theoretical background • Measurement setup • Results • Summary and outlook

1.7 Appendix

The appendix lists all information which should complement the continuous text. The appendix addresses all data which is not necessary for the general understanding, but which provides the following details:

- Detailed calculations or calculation tables
- Programming code
- Further theory
- Measuring equipment used

The appendix has to be numbered with capital letters (A.1, A.2, A.2.1, ...). For page numbering, small Roman letters (I, ii, iii, ...) have to be used.

Including an appendix is not necessary when writing a protocol or an internship report.

1.8 References

The reference list includes all sources being used in the continuous text as well as in the appendix. The IEEE formatting standard is the basis for formatting the reference list.

Using an adequate software program (such as Citavi, JabRef or the “manage sources” function in Word) helps to compile a reference list. Information for using and implementing respective citing standards in Word can be looked up [>here<](#). A general guideline can be found [>here<](#). Three simple examples: Paper [1], book[2], internet [3].

[1] J. LUTZ; *Packaging and Reliability of Power Modules*; Proceedings of CIPS 2014 Nuremberg, pp 1-8

[2] J. LUTZ, H. SCHLANGENOTTO, U. SCHEUERMANN, R. DE DONCKER; *Semiconductor Power Devices – Physics Characteristics, Reliability*; Springer 2018

[3] <https://www.infineon.com/MOSFET> [Access: 01/ 01/ 2000]

2 Formatting

The following sections will deal with the layout of the document. For final papers in particular, it is important to keep an adequate format.

2.1 Layout of a Document Page

For reasons of saving resources, it is advisable to print duplex.

Table 2.1: Formatting of a document page

Single-sided print	Duplex (book)
<ul style="list-style-type: none">• Binding margin(left): 4 cm• All other margins: 3 cm	<ul style="list-style-type: none">• Odd pages<ul style="list-style-type: none">○ Binding margin (left): 4 cm○ All other margins: 3 cm• Even pages<ul style="list-style-type: none">○ Left margin: 3 cm○ Right margin: 4 cm○ Upper and lower margin: 3 cm

2.2 Page Numbers

As mentioned in Chapter 1, page numbers have to be formatted as follows:

- Lists before the continuous text: capital Roman letters (I, II, III ...)
- Continuous text: Arabic numbers (1, 2, 3 ...)
- Appendix and References: lowercase Roman letters (i, ii, iii ...)

The page numbers have to be placed at the lower margin which is not bound. The title page does not carry a page number.

2.3 Headers and Footers

The layout of the header is up to the author. It is recommended to include the title of the chapter and/or the section into the headers.

The footer is only used for page numbers.

2.4 Outline Levels

The upper outline level is used for chapters only. Every chapter starts on a new page (duplex style: starting on odd page). Levelling should only be made up to the third level by using smaller font sizes on every new level.

The lists of references, contents, abbreviations or symbols are being formatted in the top outline level, but they are not numbered.

The appendix has to be numbered using capital letters (A, A.1, A.1.1 ...).

Outline levels have to be positioned at the left margin using black printing color. Even space has to be kept between the outline levels and the continuous text.

Every outline level needs a short description in the form of a continuous text. A bare listing of bullet points or headings is not allowed.

2.5 Font

Serif font types (Times New Roman, Cambria) are recommended for the continuous text (Times New Roman – 12pt, LaTeX – 12pt). Except for headings, a consistent font type has to be used throughout the work. The same applies to illustrations and diagrams.

The text has to be justified and hyphenated by applying a consistent line spacing of 1,5pt.

The printing color has to be black.

Symbols employed in the text are written in italics or are being inserted by using equation editors (Word: alt + Shift + =, LaTeX: $\$...\$$).

2.6 Captions

2.6.1 Figures

Figures are numbered consecutively with regard to the respective chapter. Numbering of figures in a new chapter always starts with 1. The caption has to be placed below the figure. Note the following format:

Figure x.1: This is the description of a figure [y, S. XYZ]

In case of obtaining the figure from an external source, the source has to be mentioned at the end of the description, adding the page number as well.

The description of a figure has to be placed centered below the illustration. If several figures belong to a figure description, it has to be considered that a figure has to be referenced appropriately (e.g. (above), (right) etc.). Moreover, the line space between the figure and the following text has to be the same as the chosen font size (e.g. Times New Roman 12pt).

2.6.2 Tables

Tables are numbered consecutively with reference to the corresponding chapter. Numbering of tables in a new chapter always starts with 1. The caption has to be placed above the table. Note the following format:

Table x.1: This is the description of a table [y]

In case of obtaining the content of the table from only one source, a reference in the description of the table is sufficient. If the content is obtained from several sources, then every single entry has to be referenced separately.

The description of the table is placed centered above the table itself. Note that tables should not extend over several pages and that every description can be clearly allocated to the respective table. If a table has to be separated, then the table header has to be repeated at the next page. Moreover, the line space between the description of the table and the continuous text has to be the same as the chosen font size (e.g. Times New Roman 12pt).

2.6.3 Equations

Equations are numbered consecutively according to the respective chapter. Numbering of the first equation in a new chapter always starts with 1. An equation does not require a separate caption. However, they have to be placed centered, with the corresponding number put in parentheses. Note the following format:

$$R = \frac{U}{I} \quad (\text{x.1})$$

In case of obtaining the equation from an external source, then the source has to be mentioned in the continuous text, after the respective equation has been referenced. Equations do not have to be numbered if they get embedded into the text.

2.6.4 Numbers with Units

A blank space has to be put between a number and the corresponding unit (Word: Strg + Shift + space; Latex: \,)

3 Citation Style and Referencing

Apart from the autonomous work of the author, a scientific paper is based on those findings which have been provided by other authors in the form of books, publications or other written works.

It is essential to list all the sources used when employing external findings, figures or other illustrations. Different rules have to be taken into account according to the citation being integrated directly or only analogously.

3.1 Direct Citation

A direct citation consists of parts of the content of an external source without making any changes in the wording. It is allowed to leave out parts of the text, if they are marked by [...] and the sense of the citation does not get confused.

A direct citation is marked by opening and closing quotation marks. Moreover, it is essential to verify the citation by a source with the corresponding page number.

A direct citation has to look as follows:

„This is a direct citation.“ ([1], p.1)

3.2 Indirect/Corresponding Citation

If, in contrast to a direct citation, the author uses his or her own words to express externally gained findings, then the citation is an indirect or corresponding citation.

It is not necessary to provide a source for every single sentence separately; instead, a complete paragraph can be referenced with the respective source. Referencing several sources simultaneously is equally possible.

Indirect citations can have the following format:

It is an indirect citation if the external content does not get copied word-for-word. [1]

According to [1,2,3], an indirect citation can even be used for a complete paragraph.

If the indirect citation is only used for a special sentence, then the reference has to be placed before the full stop. If a complete paragraph is referenced, then the source has to be placed after the full stop of the last sentence.

3.3 Position and Format of References

The source is indicated by a consecutive number in square brackets (example: [1]). Moreover, the source is being allocated to the reference list ordered according to the first use of the citation.

Footnotes shall not be used neither for referencing nor for further information.

4 Contents

4.1 Protocols

Protocols have to be completed as either group protocols or individual protocols and have to be handed in 14 days after performing the practical experiment, if not agreed on something else with the supervisor of the experiment. If not handed in on time, the practical training is considered as failed!

A protocol does not only entail the tasks solved in the preparation process, but also the documentation of the experimental procedure as well as the final analysis. The following content has to be kept in mind:

4.1.1 Experimental Procedure

- Which measurement task will be performed?
- Which measurement device will be used?
- Which devices under test will be measured?
- Which environmental conditions do exist?
- Did any anomalies occur during the test?
- Have some parts of the test been left out due to specific circumstances?

4.1.2 Evaluation of the Experiment

The evaluation of the experiment serves to critically deal with the measurement results with regard to the previously stipulated tasks.

4.2 Report of a Research Internship or Internship Abroad

The internship report fulfills several functions:

- Description of the task
 - Which task has been dealt with/investigated individually?
 - At which tasks has the author of the report assisted somebody else?
- Presentation of the solved task
 - Putting the task into the context or in the complete field of work of the company or the research institution
 - Classification into the current state of the art
 - Discussion of advantages and disadvantages, benefits and problems

A highly objective and scientific work will be expected.

Finally, including a subjective summary of all tasks which contains the requirement of the tasks and the organizational structure of the internship would be desirable as well.

The format of the internship report shall reflect the format of a thesis.

In preparation, it should be clarified with the external supervisor (research institution/company) and the internal supervisor (professor/staff of the chair) which

contents of the internship can be published in the report and which not. Note that a subsequent supervision of an internship is not possible and will not be supported by the Chair of Power Electronics and EMC. Note that adding collateral arrangements to protect internal contents could become necessary.

4.3 Bachelor and Master Theses

The goal of a thesis is to document the solved task scientifically correct. The rules and guidelines mentioned in the previous chapters have to be followed accordingly.

The structure of the Thesis has to be discussed with the university supervisor previously to the compilation of the actual written document.

5 Number of Pages

It is important to stick to the number of pages stipulated below. Always check with the supervisor if you are exceeding or falling below the required number of pages.

Table 5.1: Number of pages according to the type of document

Protocols	Internship Reports	Bachelor Theses	Project Reports	Master Theses
10 – 20 Pages	20 Pages	30 Pages	20 – 30 Pages	60 Pages

6 General Advice

- In general:
 - Avoid informal language
 - Use precise references
 - ☒: „... as can be seen in the table above ...“
 - ☑: „... as can be seen in Table x.x ...“
 - Every figure and every table should clearly be allocated to the respective caption. Figures and tables should not extend over several pages.
 - If figures are taken from an external source and are modified, then the source has to be indicated as follows:
 - ☑: (cf. [x])
 - Examples of every type of scientific papers are available at the chair and can be consulted for research from the staff of the chair.
 - The signed statement of authorship has to be enclosed.
 - Make use of the „Show all ¶“ function (Word: Strg + *)
- Software recommendations:
 - Document production: Word, LaTeX
 - Measurement presentation: MatLab, Origin, Gnuplot
 - Presentation of circuit layouts: Visio, Inkscape
 - Tables: Word, Excel
 - Literature arrangement: Word, JabRef, Citavi
- Internship reports:
 - Discuss the contents of the report with the respective external and internal supervisors as soon as possible
- Theses:
 - It is recommended to discuss the table of contents with the supervisor before starting to work on the details
- References
 - Wikipedia, Youtube or similar sources are useful to start an investigation to a certain topic. However, these references should not be listed within the reference list due to the unscientific character.