

# MASTER THESIS

## Your thesis title

Fachgebiet Elektrische Anlagen und Netze  
der Fakultät für Ingenieurwissenschaften  
der Universität Duisburg-Essen (Campus Duisburg)

by:

**Your name**

Email: **Your email address**

Matriculation Number: **1234567**

Supervisor:

First Reviewer: Prof.

Second Reviewer: Dr.-Ing.

Course of Study: M.Sc.

Semester: Summer Semester 2019

# Versicherung an Eides Statt

Ich versichere an Eides statt durch meine untenstehende Unterschrift,

- dass ich die vorliegende Arbeit - mit Ausnahme der Anleitung durch die Betreuer - selbstständig ohne fremde Hilfe angefertigt habe und
- dass ich alle Stellen, die wörtlich oder annähernd wörtlich aus fremden Quellen entnommen sind, entsprechend als Zitate gekennzeichnet habe und
- dass ich ausschließlich die angegebenen Quellen (Literatur, Internetseiten, sonstige Hilfsmittel) verwendet habe und
- dass ich alle entsprechenden Angaben nach bestem Wissen und Gewissen vorgenommen habe, dass sie der Wahrheit entsprechen und dass ich nichts verschwiegen habe.

Mir ist bekannt, dass eine falsche Versicherung an Eides Statt nach § 156 und nach § 163 Abs. 1 des Strafgesetzbuches mit Freiheitsstrafe oder Geldstrafe bestraft wird.

---

Ort, Datum

---

Unterschrift

## Acknowledgments

# Contents

<b>Contents</b>	<b>I</b>
<b>Figures</b>	<b>II</b>
<b>Tables</b>	<b>II</b>
<b>Abstract</b>	<b>III</b>
<b>1 Introduction to <math>\LaTeX</math></b>	<b>1</b>
1.1 Basic commands and symbols . . . . .	1
<b>2 Using Mathematical Representations</b>	<b>2</b>
<b>3 Text Structure</b>	<b>4</b>
3.1 This is a new section . . . . .	4
3.1.1 This is a new subsection . . . . .	4
3.1.2 Make a list . . . . .	4
<b>4 Figure and Table</b>	<b>5</b>
<b>5 Citation and Bibliography</b>	<b>6</b>
<b>Bibliography</b>	<b>8</b>

**Figures**

**Tables**

# Abstract

This thesis template is based on the one from [GitHub repository of Systems Security Research Group University Duisburg-Essen](#)

**Keywords**— L<sup>A</sup>T<sub>E</sub>X

# 1 Introduction to L<sup>A</sup>T<sub>E</sub>X

L<sup>A</sup>T<sub>E</sub>X is a high-quality typesetting system; it includes features designed for the production of technical and scientific documentation. L<sup>A</sup>T<sub>E</sub>X is the de facto standard for the communication and publication of scientific documents [1].

At the very beginning of this template and short tutorial of using L<sup>A</sup>T<sub>E</sub>X, some basic commands are shown in the following section.

## 1.1 Basic commands and symbols

In L<sup>A</sup>T<sub>E</sub>X, the quotation marks are not recognized as in Microsoft Word or some other text-editing environment. If you type twice ", the output will be "some quotation". Hence, one should use `` combined with " in L<sup>A</sup>T<sub>E</sub>X environment instead and the output will be “some quotation”. You can also check this in the source code.

In L<sup>A</sup>T<sub>E</sub>X, the “space” used in your code after a common command will not be shown as a space in the generated PDF-file. To add such a space, one should try to insert a ~ symbol to generate an extra space character in the text. For example, L<sup>A</sup>T<sub>E</sub>X is a typesetting system , instead of L<sup>A</sup>T<sub>E</sub>X is a typesetting system.

Sometimes it is necessary to add some number with units in the text, however the numbers and their units should not be divided into two different lines, hence try to use {\,} instead of “space” character in this case.

some example

## 2 Using Mathematical Representations

$\LaTeX$  offers powerful support for mathematical representations.

Following are some equations from IEEE Standard 738-2012 [2], which are used here as example and to show some basic operation and  $\LaTeX$  code to insert mathematical equations into your text.

If you want to insert a single equation (as the one shown in Formula 2.1), just create an “equation” environment and type the corresponding equation.

$$q_r = 17.8 \cdot D_0 \cdot \varepsilon \cdot \left[ \left( \frac{T_{max} + 273}{100} \right)^4 - \left( \frac{T_a + 273}{100} \right)^4 \right] \quad W/m \quad (2.1)$$

Maybe you also want to explain meanings of the variables used in the equation,  $\LaTeX$  offers a “tabbing” environment which can be used to align the variables and corresponding explanations. As an example, for the variables used in Formula 2.1, one may write:

where	$D_0$	is the conductor diameter,
	$\varepsilon$	is the emissivity of surface area,
	$T_{max}$	is the maximum operating temperature of the conductor,
	$T_a$	is the ambient temperature.

As shown above, to refer one variable or insert some mathematical expression in the text body, one may use  $\{\$ \$\}$  to create a mathematical expression environment.

It is also useful to write some equations in one block (as shown in Formula 2.3), however to make the equations look better, you may align the equations with each other. For example in the exemplary equations, they are aligned to the equal symbol. To align text in  $\LaTeX$  environment, the  $\&$  symbol is used.



$$q_c+q_r = q_s + I^2 \cdot R(T_s) \quad (2.2)$$

$$I = \sqrt{\frac{q_c+q_r-q_s}{R(T_{max})}} \quad (2.3)$$

Similar to the `\aligh` environment, you may create equations with `\subequations` environment, which will create 2.4a and 2.4b instead of a new number for the second equation as in Formula 2.3 did.

$$q_{c1} = K_{angle} \cdot [1.01 + 1.35 \cdot N_{Re}^{0.52}] \cdot k_f \cdot (T_{max} - T_a) \quad W/m \quad (2.4a)$$

$$q_{c2} = K_{angle} \cdot 0.754 \cdot N_{Re}^{0.6} \cdot k_f \cdot (T_{max} - T_a) \quad W/m \quad (2.4b)$$

## 3 Text Structure

In a chapter it usually has several levels of sections and subsections to keep the contents well organized.

### 3.1 This is a new section

#### 3.1.1 This is a new subsection

Although in  $\text{\LaTeX}$ , there is also a `\subsubsection` command which can generate an extra level of contents under subsection, it is not recommended to be used. The possible solution maybe:

##### **A new paragraph**

instead of

##### 3.1.1.1 A subsubsection

It should be noticed that all font types and spacing before or after the titles can be customized in the `.cls` file.

#### 3.1.2 Make a list

It is also quite often to list out some important points in the text.

- This is an unimportant entry
- This is another unimportant entry :D

## **4 Figure and Table**

## 5 Citation and Bibliography

There are a lot of literature management software in the market, e.g. EndNote, Citavi, Mandelley, etc. Taking Citavi as example, one can add literature and reference sources into this software and exported all references into a bib-file, which can be read by  $\text{\LaTeX}$  and directly added into the generated pdf-file.



# Bibliography

- [1] LaTeX3 Team. *LaTeX – A document preparation system*.

URL: <https://www.latex-project.org/>.

- [2] *IEEE standard for calculating the current-temperature relationship of bare overhead conductors*. eng.

New York: Institute of Electrical and Electronics Engineers, 23 December 2013.

58 pp. ISBN: 9780738188881.

URL: <http://ieeexplore.ieee.org/servlet/opac?punumber=6692856>.