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| **TECHNICAL UNIVERSITY OF KOŠICE**  **FACULTY OF Economics** | |
| **Title**  **Doctoral thesis** | |
| **2010** | **First name LAST NAME** |

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| **TECHNICAL UNIVERSITY OF KOŠICE**  **FACULTY OF Economics** | | |
| **TITLE** | | |
| **Doctoral thesis** | | |
| Study programme: | | Study programme |
| Field of Study: | | Economics and management |
| Department: | | Department (Skratka katedry) |
| Supervisor: | | degree Name Surname, degree |
| Consultant: | | degree Name Surname, degree 1  degree Name Surname, degree 2 |
| **Košice 2010** | **First name LAST NAME** | |

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| **Abstract in English**  Abstract in the Slovak language is a mandatory part of every thesis. It is a concise short description of the content of the document. The abstract is usually informative and preserves the thematic and stylistic features of the thesis. It does not express the evaluative opinion of the author. It contains data on the objectives of the thesis, methods, results and conclusions. The text of the abstract is written as one paragraph. The abstract does not contain references to the text of the thesis. It should have a length of about 250 words, it should not exceed one page. In stylization, whole sentences, verbs in the active gender and a third person are used. Technical terminology is used, less common terms, abbreviations and symbols are defined in the text when they first appear.  . |

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| **Abstract in Slovak**  The text of the abstract in the world language is needed for integration into international information systems (i.e. The Network Digital Library of Theses and Dissertations). If it is not possible to place the language version on one page with the Slovak abstract, it is necessary to place it on a separate page (the foreign language abstract cannot be divided and stated on two pages). |

**Declaration**

I hereby declare that this thesis is my own work and effort. Where others sources of information have been used, they have been acknowledged.

Košice, May 20, 2020

..........................................

*Signature*

**Acknowledgement**

I would like to express my sincere thanks to my supervisor prof. Ing. Miltom Friedman, PhD, the main Supervisor. Special mention should go to Dr. Adam Smith, PhD, for his constant, and constructive guidance throughout the study. To all others who gave a hand, I say thank you very much.

**Preface**

Foreword is a mandatory part of the doctoral thesis.

In the preface, the doctoral student will state the basic characteristics of his / her doctoral thesis and the circumstances of its origin. Explains the reasons that led him to choose the topic, goal and purpose of the work and briefly informs about the main methods he used in the preparation of the thesis.

I.e.:

The issue of .... is the subject of numerous researches. In our country, XY deals with these issues in the textbook (the textbook title). In the world ...

The main reason that led me to choose the topic was ... The intention of my work is ... My ambition is to solve...

The submitted doctoral thesis was created in collaboration with …

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List of Symbols and Abbreviations

μ **micro**, 10-6

SI **S**ystème **I**nternational

V **volt**, basic unit of voltage in the system SI

List of Terms

**The doctoral thesis** is an extensive scientific debate in which a complex professional problem is solved on the basis of scientific research and with the use of rich documentary material as well as scientific methods.

**Font** is a file containing rules for displaying text in a given font, e.g. on the printer. What we see is writing; font is a file and we don't see it.

**Meter** (m) is the distance that the light travels in the vacuum over a time interval of 1/299 792 458 seconds.

**Process** is a sequence or series of timed events so that each previous event participates in determining the next event.

Introduction

The main text of the thesis contains an introduction, core (numbered chapters and subchapters of the second and third level with illustrations and tables), conclusion and a list of used literature. The introduction should not be numbered.

Introduction briefly and clearly, but in more detail than in the preface

* expresses the state of knowledge or practice in the given area, which is the subject of the work,
* justify the topicality of the topic,
* raises problems that he wants to solve,
* explain the purpose and objectives of the work,
* describe the methods used and the solution procedure,
* state the relation of the work to other works in the given area, specify the information sources and sources which he / she used the most (and which he / she shall state in the list of used literature),
* justify the importance of solving the problem,
* outlines the brief content of the chapters.

In the introduction, it is not necessary to repeat what is stated in the abstract. It is not appropriate to describe in detail the methods, the experimental results, or to repeat what is stated in the conclusion. Although the introduction is placed at the beginning, its final version is written by the graduate only after the completion of the entire work.

1. The problem expression

The text of the doctoral thesis may contain within the chapter 1 the formulation of the task resp. tasks solved at work. In this part, the doctoral student will explain the way in which the tasks and theses will be formulated in the assignment. It will also provide an overview of the terms of the solution. If the formulation of the task is not necessary, a different title of this chapter (Title of Chapter 1) will be given according to the solved problem.

The first chapter usually represents the theoretical and methodological part of the work. This section usually contains:

* theoretical knowledge related to the given task (the diplomat presents the knowledge acquired during the study),
* a description of the methods and procedures used by the graduate in solving the task.

1. Analytical considerations
2. Main part of thesis

The core of the next chapters is the analysis and synthesis leading to the solution of the problem.

* 1. Subsection

The subchapters of the diploma thesis are used to divide the text of the diploma thesis with the aim of the greatest possible clarity.

* + 1. Third level of subsection

Edit your work in chapters and subchapters. The numbers of chapters and subchapters (second and third levels) are quoted in the text as follows:

... In Chapter 2 we have already stated that ...; ... see ... etc. ...

The scope of the diploma corresponds to the purpose and content. In some fields of study of technical sciences, works are generally shorter, in the social sciences they are more extensive. The scope of the work is usually 60 - 100 pages. Only the main text, i.e. j. introduction, chapters, conclusion and list of used literature. More important than the scope of work is the quality of work and the level of its processing. When writing, it is important to pay attention to the balance (proportionality) of the individual parts of the work:

* the introduction usually has 2-3 pages,
* the theoretical-methodological part usually makes up one third of the work,
* other chapters make up about two thirds of the work,
* the conclusion is usually 2-3 pages.

#### Fourth level of subsection

… text … text … text … text … text … text … text

1. Illustrations, tables, equations

In addition to verbal text, information expressed in pictorial form and symbols may also appear in the thesis.

* 1. Illustrations

**Illustrations** are pictures containing **graphs, diagrams, maps, diagrams, etc.** It is not necessary to distinguish between different types of illustrations, it is sufficient if all of them are marked as "Image". All illustrations must be numbered in a continuous series of numbers throughout the work and must have captions (image name) for each image. The text of the title must be comprehensible even without context. They should be placed immediately after the text where they are mentioned for the first time (preferably on the same page). The image should be centered if possible. When referencing a given image in the text, cross-references to the image must be used (napr. Chyba! Nenašiel sa žiaden zdroj odkazov.). We insert figures and tables in this template as follows:

* Insert → Image
* Right-click the inserted image → Insert Description
* In the Description window, next to the Label option, select "Fig."
* For the Location option, select the option "Under the selected item"
* In the Description field, enter the name of the image

Sablony\Sevcovic\obrazok.emf

Fig. 1 Graph of dependency

In the text, we create **cross-references** to the created images and tables **(**pozriChyba! Nenašiel sa žiaden zdroj odkazov.**).**

We will create a **cross-reference** to **figures** and **tables** as follows:

* set the cursor where the link should appear,
* select from the toolbar: Insert → Cross-reference,
* in the dialog box for Cross-reference, select Tab or Fig in the Reference Type field.
* in the Insert reference field, select to insert a reference to: Only label and number,
* select a table or image from the list of descriptions and check Hypertext link (Insert as Hyperlink),
* Insert a Close.

**Update cross-references throughout the document: CTRL + A, then F9.**

* 1. Tables

The tables present the ideas and statements described in the work. Any table material that consists of more than four or five rows should be processed into a table form **Chyba! Nenašiel sa žiaden zdroj odkazov.** The description and header of the table should be clear separately without a reference to the text. Headers should express the type of quantity and types of units in the form "quantity / unit", it is necessary to use the same symbols and abbreviations as in the text. Each table must have a serial number and a caption, usually located above the table. The table should have the same orientation as the text of the thesis.

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|  | PP – 01 | PP – 05 | PP – 10 | PP – 16 | PP – 22 |
| C·108 (s−2) | 10.1 | 10.0 | 11.0 | 9.2 | 8 |
| t0 ·10−14 (s) | 2.63 | 1.44 | 0.95 | 2.21 | 10.83 |
| *Ea* (kJ) | 34.26 | 8.33 | 39.76 | 37.31 | 31.86 |
| *Tmin* (K) | 354 | 367 | 367 | 369 | 367 |
| *T1min* (ms) | 141 | 160 | 157 | 175 | 181 |
| *ΔM2* (Gs2) | 5.49 | 5.66 | 5.16 | 5.09 | 5.02 |

Tab. 1 Environments variables

* + 1. Tables taken from other sources

If we take over the table or its part from another author or from another source (i.e. from company materials, internal materials of the institution, etc.), it must be stated below the table.

I.e.:

Source: Internal materials, Ministry of Economy, SR, year 2003.

|  |  |
| --- | --- |
| Title | Unit |
|  |  |

Tab. 2 Numbers

Source: Description of source

* 1. Equations, formulas

The equations are given in the middle of the line, the explanations of the symbols at the beginning of the line. The explanations of the symbols are given from the beginning of the line. If there are more formulas in the work, we enter the formula number in round brackets without spaces located at the right end of the line. Italics are used to write physical quantities and mathematical variables. We use a system of SI units (ISO 31 and ISO 1001). When writing equations we use the equation editor (we must have it installed).

We insert the equations in this template as follows:

* Insert *→ Autotext → Equation*
* mark the number of the equation (in parentheses on the right) and make a bookmark for other links in the text via:
  + Insert *→ Bookmark →* type *Title of equation* to the field *Bookmark name (i.e.. equation\_)*
* In the Description window, select the Label option *„Formula / Equation“*

 , . (1)

 , . (2),

I.e.:

Start with equation

 , . (3)

Graphical course of solving the equation (2) we see in the figure (**Chyba! Nenašiel sa žiaden zdroj odkazov.**).

* 1. Hypertext shortcuts

Using the cross-reference function, it is possible to create references in the text to chapters, subchapters, equations, formulas, figures, tables, etc.

Cross-references can be created for numbered lists, headings, bookmarks, footnotes, descriptions, numbered paragraphs, and so on. The basis is to have a numerical list of references. You can then cross-reference these references, and when the order of the references in the list changes, Word can automatically update the reference numbers. To update cross-references throughout the document, press CTRL + A then F9**.**



Fig. 2 Time vs. amplitude

1. Conclusion

The conclusion should capture a clear and accurate presentation of the deductions based on the core of the work. It must be a factual summary of one's own contribution or view of the problem being solved. Quantitative data may be included, but details should not be provided. The conclusion should not contain anything that is not in the text of the thesis and must follow the considerations and arguments in the text of the thesis.

In conclusion, it is appropriate to point out other open (so far unresolved) problems, which should be paid attention to and which exceed the recommended scope of the diploma thesis. Descriptions of other proposed activities are recommended, which directly result from the conclusions or experiences gained during the processing of the work.

Bibliography

All documents that you use in the work must be included in a list consisting of bibliographic references, which we mark e.g. List of used literature. Standards apply to the creation of lists of used literature. The aim is to make it possible to clearly identify the source used from the list of used literature and to be able to search for it again without difficulty.

The main source of data for creating bibles. references is the title page (ie the first page in the book, where the title is given to the author, etc.), or his reverse. References may relate to books, journals and other sources of information (conference proceedings, patent documents, standards, recommendations, qualification papers, personal correspondence and manuscripts, links through an intermediary source, electronic publications) used in the work.

The **citation technique** determines the way we refer to citations in a document, and according to the standard (see STN ISO 690 [6]) there are several ways of citation:

• method of numerical citations (citations are placed in the work according to reference numbers (number from the List of used literature), which correspond to the order of citations in the text),

• citations in notes,

• first date and date method. (citations are placed alphabetically according to the first data (author's name + year of publication)).

In the **method of numerical citations**, in the list of bibliographic references, each cited work is listed in the order in which it was mentioned and numbered in the text. The numbered references in the text are given in brackets and refer to the documents in the order in which they are cited for the first time. Subsequent citations are given the same number as the first citation. If specific parts of the document are cited, page numbers may be given after the citation number. The numerical citation method is described in detail in the STN ISO 690 standard (see [6]).

**An example of a list of used literature is given on the following page.**

1. MIHALÍK, Ján – ZAVACKÝ, Jozef – GLADIŠOVÁ, Iveta: Signály a sústavy : Návody na cvičenia. Košice : TU-FEI, 2004. 241 s. ISBN 80-8073-138-1
2. CIMBALA, Roman - BALOGH, Jozef - DŽMURA, Jaroslav: Diagnostika výkonových transformátorov s využitím prvkov umelej inteligencie 1. In: Elektrotechnický magazín ETM. roč. 14, č. 1 (2004), s. 8-9.
3. KOVAĽAKOVÁ, Mária - NOVÁK, Ladislav - STANČÁKOVÁ, Anna: Vplyv prímesi chrómu na proces hydrogenácie a dehydrogenácie FeB amorfných zliatin. In: 13. konferencia slovenských fyzikov : Zborník príspevkov. Košice : Slovenská fyzikálna spoločnosť, 2004. s. 145-146.
4. Therion Biologics Corporation, Cambridge, MA: Recombinant fowlpox virus and recombination vector. Inventors: Cohen L. K., Panicali; D. L. Int. Cl.5 C12N/701 United States Patent, 5093258. 03.03. 92.
5. ISO 690-2: 1997, Information and documentation – Bibliographic references - Part 2: Electronic documents or parts thereof.
6. STN ISO 690:1998 : Dokumentácia - Bibliografické odkazy - Obsah, forma a štruktúra.
7. Zákon č. 183/2000 Z.z. o knižniciach, o doplnení zákona Slovenskej národnej rady č. 27/1987 Zb. o štátnej pamiatkovej starostlivosti a o zmene a doplnení zákona č. 68/1997 Z.z. o Matici slovenskej.
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13. KOMOROVÁ, K. Výstava vzácnych kódexov. In Knižnica [online]. Martin : SNK, 2002 [cit. 2003-02-14], 2002, roč. 3, č. 2, s. 84. Dostupné na internete: <http://www.snk.sk/kniznica/kniznica.html>. ISSN 1212-5075
14. PARKER, Elliott. Re: Citing Electronic Journals. In : PACS-L (Public Access Computer Systems Forum) [online]. Houston (Tex.) : University of Houston Libraries, 24 November 1989; 13:29:35 CST [citované 2003-01-05]. Dostupné na internete: <telnet://brsuser@a.cni.org>.
15. BURAN, Daniel. 2003. Environmentálne informačné zdroje a služby v strednej a východnej Európe [elektronická pošta]. Správa pre: Mária MALÁ. 2002-11-15 [cit. 2003-01-05]. Osobná komunikácia.
16. GONDA, Vladimír: Ako napísať a úspešne obhájiť diplomovú prácu. Bratislava : Elita, 2003. 124 s. : il. ISBN 80-8044-076-X
17. Katuščák, Dušan : Ako písať záverečné a kvalifikačné práce. Nitra: Enigma, 2004. 162 s. il. ISBN 80-89132-10-3

Appendices

1. CD media – doctoral thesis in electronic form, appendices in electronic form.
2. User's Guide
3. System Guide

This part of the diploma thesis is mandatory and contains a list of all appendices, including electronic media. The names of the annexes in the list must be the same as those given in the relevant annexes. The printed appendices have identification data on the first page - information identical to the title page of the diploma thesis supplemented by the name of the relevant appendix (System Manual, User Manual). The identification data is also on the enclosed disks or floppy disks. If there are more media, they are also marked numerically in the form I / N, where I is the serial number and N is the total number of media.

Each annex starts on a new page and is marked with a separate letter (Annex A, Annex B, ...). The page numbering of the annexes follows the page numbering in the main text.

Curriculum vitae

This section is optional. The author can state his biographical data, data on interests, participation in projects, participation in competitions, awards received, stays abroad, internships, publications, etc.