



Universität der Bundeswehr München

# Institut für Werkstoffkunde

## Instructions and recommendation for the preparation and design of study and Bachelor's and Master's theses

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# **1 Structure of the thesis**

The thesis should comprise the following listed parts which should be visibly structured in the corresponding order. Depending on the assignment, reasonable deviations may be necessary.

## **1.1 Title page**

The title page contains a mention of the topic, the type of thesis and the name of the author. In addition, the supervising institute, the supervising research assistant as well as the submission date (month/year) are indicated.

## **1.2 Abstract (optional)**

The abstract should briefly state the aim of the thesis. The most important methods and results of the thesis should also be mentioned in the abstract.

## **1.3 Statement of authorship**

The author of a Bachelor's or Master's thesis must provide their thesis with a declaration stating that they prepared the work independently and without the use of sources and aids other than those specified. The declaration must be signed by the student (see Examination Regulations LRT).

## **1.4 List of contents**

A suggested format for the table of contents can be found on the first page of this document. It is recommended to format the headings using template styles from the beginning so that the table of contents can be created automatically and updated quickly and safely in case of subsequent changes.

## **1.5 List of figures (usually unnecessary)**

The list of figures contains an ordered list of the figures included in the main text and the appendix. It is recommended that automatic referencing be used here as well. The list of figures can then be created in a similar way to the table of contents and updated at any time (see chapter 1.4).

## **1.6 List of tables (usually unnecessary)**

The list of tables contains an ordered list of the included tables in the main text and in the appendix. It is recommended to make use of automatic referencing. The table list can then be created in a similar way to the table of contents and updated at any time (see chapter 1.4).

## **1.7 List of abbreviations (optional)**

The abbreviations and formula symbols used are to be listed alphabetically with the corresponding SI units in the order of:

- Upper-case letters
- Lower-case letters
- Greek letters
- Indices
- Abbreviations.

Throughout the thesis, the same formula symbols should not have different meanings and a term should not have different formula symbols. If other or different formula symbols are used by the references, they should be replaced by the author's own formula symbols. If an abbreviation is used in the text for the first time, it must also be written out in full, e.g. SEM (**S**canning **E**lectron **M**icroscope) or to be placed after the written word, e.g. scanning electron microscope (SEM).

Chemical elements or alloy designations do not require explanation.

## **1.8 Introduction**

The introduction should classify the addressed topic in the field of aerospace technology in a goal-oriented manner, **without going into great detail**. The problem is presented, i.e. the motivation for carrying out the research, and the goal of the research is formulated, along with the processing strategy.

## **1.9 Chapters of the main text**

The structure of the main text into individual chapters and subchapters should provide an indication of the content of the following subchapter by means of precisely formulated headings. From any existing literature, the most important results should be worked out as a starting point for the own investigations and summarised in a chapter "State of the art" or "Literature review". It is advisable to briefly reproduce the most important contents that are directly related to one's own problem and to cite the reference. Content that is not related to your own work should not be listed here!

The presentation of own investigations is advantageously divided into:

- State of the Art / Literature Review
- Materials and Methods
  - Method of data acquisition/observation, measurement, physical and chemical analyses, numerical approach/simulation setup, ...
  - Description of the experimental set-up, stating the measuring devices used and their measuring accuracy (graphic representation of the experimental set-up facilitates understanding)
  - Description of the procedure of the experiments as experimental procedure
  - Statistical evaluation methods, model applications etc.

- Results
- Analysis and Discussion of the Results

The information is only complete if it allows the reproduction of the results, i.e. assumptions and prerequisites must be shown. The result is presented on the basis of the measured values obtained or the specified input data for the modelling. The experimental results are given objectively, i.e. without any evaluation of their own. They are interpreted and, if necessary, explained in more detail in connection with the experimental setup and its special features. This also includes the discussion of errors. Calculation methods should be presented concisely and accurately without trivial explanations. The origin of any numerical values must be made clear. **A clear distinction is to be made between the objective presentation of the results and their interpretation. The most appropriate way to do this is to have the results and the discussion in two separate sections.** In certain situations, however, a (partial) discussion can already take place in the results section.

### ***1.10 Summary and outlook***

In this section, the results of the thesis are to be summarised by the student and critically considered as well as evaluated regarding their significance, their transferability and their contribution to research and the expansion of the state of knowledge in the context of the state of knowledge. The final consideration can be supplemented by an outline of the resulting consequences and an outlook on possible further research.

### ***1.11 Appendix (optional)***

Information that is valuable to the reader but interferes with the flow of reading belongs in the appendix. The appendix may contain the following supplements:

- General plans
- List of experiments conducted
- Measurement protocols
- Longer derivations of equations
- Computer programmes, printouts

### ***1.12 References***

The bibliography is to be compiled according to the instructions in subchapter 2.8.

## **2 Shape of the thesis**

### **2.1 Printing and binding of the thesis**

The entire written thesis must be submitted in bound form, e.g. as laminated binding, ring binding or similar. Clip folders, loose-leaf binders, index folders, loose-leaf binders or similar systems from which individual pages can be easily removed or replaced are not permitted. Three copies plus a data carrier (CD/DVD) with the collected data and diagrams must be submitted to the supervisor on time.

### **2.2 Writing instruction**

The work is to be submitted in German or English. Spelling should be checked by the word processor. A font that is easy to read should be chosen. For the text, a font size of 12pt has proven to be suitable when printed in A4 format.

The text should be written in justified style. Headings are written left-aligned, without a full stop at the end and without underlining. Chapters are written either with Arabic numerals or with capital Latin letters. Subchapters are numbered with Arabic numerals.

A comma is used as a decimal separator (in English a full stop). Units are separated from the numerical value by a (possibly half) space (exception: degree symbol, "°"), but must not be separated at a line or page break (protected space). The same applies to pictures and tables, e.g. Figure 1 or Table 1. For larger numbers, readability should be improved by forming groups of three: e.g. 112,438 m.

### **2.3 Numbering of pages**

The following remarks represent common conventions which may be deviated from in individual cases. The following pages are not numbered:

- Cover and end sheet
- Title page
- Abstract
- Statement of authorship

Starting with the table of contents, the following parts of the work are numbered consecutively with Roman numerals:

- List of contents
- List of tables
- List of figures
- List of abbreviations

Starting with the introduction, the following sections of the paper are numbered in Arabic numerals:

- Introduction
- Main text

- Summary and outlook
- References
- Appendix (optional)

The page number is to be inserted either in the footer or in the header.

## **2.4 Header and footer**

Headers and footers facilitate orientation in the thesis. The design of the header or footer with information on page number, chapter heading, etc. is to be done by the student. Footnotes as supplementary comments should be provided in the text with superscript, consecutively numbered and listed at the end of the page. If necessary, a smaller font size (e.g. 10 pt) should be used.

## **2.5 Figures and tables**

Diagrams, drawings and photographs are referred to as figures. Other terms, such as photo, diagram or picture are inadmissible. Figures and tables are to be inserted in the continuous text, if possible after the first reference and before the next section. Figures that are DIN A4 or larger in size are to be inserted in the appendix. Figures and tables that are not referred to in the text do not belong in the paper. Complicated interrelationships and processes should be supported in their comprehensibility with schematic illustrations if possible.

Figures and tables are each given their own consecutive numbering. It is advisable to number by chapter, e.g. Fig. 1.2. **Figures are given a caption below the figure, which should be clearly distinguished from the body text in the layout, and no title. Tables receive a caption above the table.** If figures or tables are taken from other authors, this should be noted in the caption with a reference to the source or, for example, "modified according to DYCK [1]". As a general rule, figures and tables should be labelled in such detail that they can be understood without the surrounding continuous text. As already mentioned, it is advisable to use the referencing function of the word processor, since subsequent changes (e.g. additionally inserted figures) minimise the workload for renumbering and changes in the list of figures.

## **2.6 Equations**

Equations are set off from the text by a blank line and should be indented. The indentation should be uniform throughout the document. Each equation is given a consecutive number in round brackets, e.g.:

$$y = a \cdot x + b \cdot x^2 \quad (1)$$

A list of equations is rarely necessary.

## **2.7 Bibliography**

All passages in the text that refer to studies by other authors are to be marked with a reference in the form of a number in square brackets or as a superscript at the end of the corresponding sentence. The numbering is done according to the specifications in the bibliography. Sources can alternatively be marked by naming the author(s) in capital letters and in connection with the year (e.g. [BAER20]). In this case, only the first author is named with the addition et al. if there

are several authors.

The reference is usually placed at the end of the sentence that is supported. Literal citations and footnotes on each page (humanities citation style) are not customary.

## **2.8 References**

In the list of references, only the references listed in the text and not everything that has been read on the subject are listed in the order in which they are used in the text (if numbers are used) or in alphabetical order (if author-year citation style is used). The following guidelines are to be observed, whereby a complete citation of references and a consistently executed citation style are more important than the exact adherence to the format specifications.

### **2.8.1 Author's names and titles**

Authors' titles are omitted, name affixes ("von", "de") are placed before the family name. For authors, the surname is given first, then the first name.

Example: von Fürst, K.; Kaiser, P.; König, B.; ...

### **2.8.2 Books**

The references are given according to the following scheme: Author(s): Title, publisher, possibly place, possibly edition, year of publication. Example:

Gottstein, G.: Materialwissenschaft und Werkstofftechnik. Springer Vieweg, 4. Auflage 2014.

For books created by very many (>5) authors, no author is given. Example:

Les catastrophes écologiques. McGraw-Hill, Paris, 1987.

### **2.8.3 Compilations, conference proceedings**

If the book was not written by an individual, but published, the abbreviation "ed." is given in brackets after the name. If there are several editors, it is sufficient to give the first name. If there is no indication of the author, the name is given anonymously instead.

The sources are cited according to the following scheme: Authors: Title of contribution, editor, title of work, possibly volume no., (year of publication) pp. ...-... .

[1] Bär, J.: Determination of the cyclic plastic zone using ECCI-Technique, in: A. Carpinteri, F. Iacoviello, L.P. Pook, L. Susmel, (Hrsg.), Proc. of the 4th Int. Conf. on Crack Paths, (2012), 975-982.

The title of the contribution and pp. ...-... are given. in the event that the author has only made a partial contribution to this book or conference proceedings.

### **2.8.4 Journals**

Format: Authors: Title of publication. Journal name, volume, (year) Page ...-... DOI (Digital Objects Identifier).

- [1] Bär, J.; Volpp, T.: Vollautomatische Durchführung von Ermüdungsrißausbreitungsexperimenten. *Materials Testing*, **43** (2001) 242-247, <https://doi.org/10.1515/mt-2001-430610>.

### **2.8.5 Standards and guidelines**

DIN number or guideline designation: Title, publisher, place (year)

### **2.8.6 Habilitations, dissertations, theses, student research projects**

Habilitations and dissertations are eligible for citation. Opinions differ in the case of master's/student theses, as there is no entitlement to public lending for these. In view of the fact that it is also customary internationally to cite personal communications with appropriate reference as the source, it is also acceptable to cite student theses. The following procedure should be followed for student theses:

Author, title of thesis, name of university, faculty or department, type of thesis (year)

- [1] Müller, M.: Untersuchung der Wirkung von Überlasten im Zugschwellbereich an CCT-Proben, Universität der Bundeswehr München, Institut für Werkstoffkunde, Diplomarbeit (1995).

In individual cases, a private message, for example from the supervising university teacher or similar, with the name and year can also be used.

For habilitations/dissertations, the procedure is analogous, with the designation habilitation or dissertation as the type of work. If the work is published by a publisher, e.g. as part of a series, the source is indicated as follows:

Author, title of the work, publisher, place of publication, year. Name of the university, faculty or department, type of work, (year), series in which the work was published, if applicable.

### **2.8.7 Brochures**

Company, title of the brochure, place, possibly (year)

### **2.8.8 Web document**

Title of the website, URL, date of access, e.g.:

Projekt MarioCCArt: Eigenschaften von partikelverstärkten CCA-Legierungen, <https://www.unibw.de/iwk/forschung/marioccart>, abgerufen am 28.11.2020