How to write a thesis...

... at the Institute for Nonferrous Metallurgy and Purest Materials (INEMET) at the TU Bergakademie Freiberg.

The instructions given in this guide must be observed to ensure the proper procedure for the preparation of student research projects and theses and to ensure that the necessary formalities are fulfilled when submitting them.

1 Start of the thesis

1.1 The topics for theses are handed out on the dates specified in the study guidelines.

1.2 After the hand out, students are given an oral introduction on the topic by the academic supervisor, including first references to scientific publications and a time schedule.

1.3 The official registration of the topic (in the student office) must take place before the start of the thesis. Two copies of the cover sheet for the thesis must be signed by the institute director and the head of the study program.

2 Supervision of the work

2.1 Each work is supervised by a research associate of the institute. The supervisor is available for consultations on technical and administrative questions. The consultations requested by the student must be arranged in advance with the supervisor.

2.2 A technical supervisor is assigned to provide support in solving experimental problems, if necessary.

3 Instructions on legal regulations

3.1 Before the beginning of the experimental work, a briefing on the relevant legal regulations for occupational health and safety and fire protection, in which all students must participate, takes place. This participation has to be confirmed by signature. The student is not permitted to start the experimental work prior to the instructions.

3.2 Further instruction on special regulations, which must be observed when undertaking individual tasks, is provided by the scientific supervisors or by authorized persons at the relevant workplaces.

3.3 All students must participate in the regular occupational health and safety trainings at the INEMET during the realization of their work.

3.4 At the beginning of the work, instructions are given on provisions concerning the confidentiality of the documents used for the work and of their own results, if necessary.

3.5 All instructions must be recorded.

4 Working hours at the INEMET

The working hours at the INEMET begin at 7.00 a.m. and end at 4.00 p.m. Students are only entitled to work at the Institute after 4.00 pm but not later than 6.00 pm or up to the times specified in the study guidelines if:

- the remaining time is fully exploited
- at least one supervisor from the institute is available after 4.00 p.m.

During the whole experimental time, at least one second person must always be within earshot.

5 Use of artificial intelligence (AI)

5.1 The use of generative AI (AI that generates new texts, images, videos, etc.) must be disclosed in the declaration of independence (see 6.2). Failure to disclose or incorrect disclosure will result in the work being graded as 'unsatisfactory (5.0)'.

5.2 AI may only be used as a supporting tool. AI must not be used to replace independent thinking or writing.

5.3 The entry of personal data, data from project partners and research results into an AI system is not permitted, as the necessary data protection cannot be guaranteed. Failure to comply may result in legal consequences.

5.4 The student bears full responsibility for the submitted work. Incorrect or missing references will be considered plagiarism. Always check and cite the primary sources (papers, books, etc.).

5.5 Below are some examples of the use of AI:

Permitted (with disclosure)	Prohibited
Improvement of spelling and grammar in individual sentences.	Copying of entire sections of text created by AI.
Let AI give you suggestions for designing diagrams (not with real measurement data!), which you then implement yourself. Create schematic illustrations with AI.	Generate diagrams with real data using AI.
Support in literature research (check specified and missing sources yourself!). Assistance with the translation of literature. Brainstorming with AI to familiarize yourself with a topic (critically examine AI responses!).	Use AI to plan experiments (DoE software may be possible after consultation with supervisor).

6 Preparation and submission of the thesis

6.1 The thesis must be prepared in strict compliance with the guidelines listed in Appendix.

6.2 The thesis must be accompanied by a statutory declaration with the following words:

DECLARATION

I hereby declare that I completed this work without any improper help from a third party and without using any aids other than those cited. All ideas derived directly or indirectly from other sources are identified as such. In the selection and use of materials and in the writing of the manuscript I received support from the following persons:

...

Persons other than those above did not contribute to the writing of this thesis.

In creating this work, I used the following systems based on generative artificial intelligence (AI):

Task	*AI system*	*Type of usage*
literature review	*Scispace*	*Output of possible references, which were then checked manually*
...	...	...
...	...	...

This thesis has not previously been published in the same or a similar form in Germany or abroad.

Date/Signature

6.3 Student theses must be handed in at the secretary of the institute. Bachelor/Master/Diploma theses are to be handed in at the student office of the university for registration and confirmation. Samples, reports, data and other documents or records that have been created during the work are to be handed in for archiving in accordance with the instructions of the academic supervisor.

6.4 Late submission of the thesis will result in a grade of "not passed".

6.5 Any plagiarism submitted will also result in a grade of "not passed.

7 Requests for extension

Requests for an extension of the deadline must be submitted to the Director of the Institute via the academic supervisor in time, but at least 4 weeks before the deadline, with detailed reasons. Requests for the extension of the bachelor/master/diploma thesis are to be submitted to the Dean of Studies of the Faculty via the Institute Director. The official form depends on the study direction.

8 Defence of the Thesis

The date for the defense of the student thesis is set at least 14 days in advance in consultation with the reviewers and supervisors. The defense procedure consists of a presentation of the relevant results (with a duration of 20 min) and the actual defense of the work.

Alexandros Charitos (Institute Director INEMET)

Appendix

Format and Structure of the Thesis

Page format:

White paper with DIN A4 format, margin: left 30 mm (for documents >100 pages, a 40 mm margin on the left side is recommended), top 25 mm, bottom 20 mm (the margins must also be respected for figures and tables); consecutive page numbering, page 1 is the title page (without indication of page number). At the beginning of the introduction at the latest, a header at the top right should be included to make it easier for the reader to find his way around the document. To reduce paper consumption, it is advisable to print double-sided.

Font:

The font size should not be smaller than 10 pt. within the whole document. This also applies to data in figures and tables. A typical font size for the text is 11 or 12 pt. Usable fonts are i.e., Times New Roman, Arial, Courier, or Garamond (in accordance with the supervisor, other fonts may be permitted).

Text layout:

The text is to be written with line spacing 1.5. Chapter, section and subsections always start with a new line. Two blank lines are to be provided between sections and before a new heading. A main chapter always starts with a new page. A heading must be followed by at least three lines of text, otherwise, a new page must be started. Each heading is followed by the text with two times the basic line spacing for a chapter and one basic line spacing for a new section. If several headings follow each other, they are separated by two times the basic line spacing.

Tables and figures (photos, drawings, ...):

They are to be numbered consecutively and provided with captions and legends. The illustrations and tables are to be designed in a way that they can be understood without accompanying text. When arranging them within the text they should be placed as close as possible to the accompanying text. A link to a figure or to a table has always to be added before or on the same page of the respective representation. All representations must be linked. A figure always has the caption below it, a table always

above it. Captions and figures should be made horizontally without visible frames. Folded pictures are to be avoided. Tables shall be divided, if necessary, even if this necessitates repetitions. Tables and pictures should be arranged as far as possible in the direction of the text and not at right angles to it. In the case of photographic images, only the parts that are important for the content are taken over; scales or objects of comparison of known size give the scale. For reproduction, original photographs or their parts are used if possible. If images, especially photographic images, do not originate from the author, the author must observe the valid copyrights and identify the creator.

Chapter/Section numbering:

According to DIN 1421, a threefold subdivision should not be exceeded. It should also be noted that a subdivision must have at least two sections/subsections of the same type. This means that a single section/subsection X.1 or X.Y.1 (without the existence of X.2 or X.Y:2) is not permitted.

Example:

Chapter	Section	Subsection
1 or 1.		
2 or 2.	2.1	
	2.2	
	2.3	2.3.1
		2.3.2
3 or 3.		
4 or 4.		
...		

Equations, reactions and units:

The used brackets should be large enough to clearly indicate which component they enclose. Equations and reactions are to be numbered consecutively within round brackets. A designation with Roman digits is acceptable. The international system of units and the quantities and abbreviations specified in the standards must be used consistently. Accordingly, abbreviations of the units should generally be used instead

of written out units (kg instead of kilogram). In addition, a space should be inserted between the number and the unit (or %) (as the unit is a word in its own right). The number and unit must not be separated by a line break (use non-breaking spaces). When specifying compositions in percent, the quantity referred to must also be indicated (wt%/mol%/vol%).

Structure of the thesis:

The work must be clearly structured and provided with main and subsections. Tables and pictures should be included in the text if possible.

The following items should be included (Deviations in the structure can be discussed with the supervisor):

- ✓ Cover page (first page, without numbering)
- ✓ Cover sheet (final thesis, signed by the institute director and head of the examination committee/board, without numbering)
- ✓ Task, if available (without numbering)
- ✓ Signed declaration (without numbering)
- ✓ Thesis contribution (in papers or conferences, if any)
- ✓ Acknowledgement (optional)
- ✓ List of symbols and list of abbreviations
- ✓ Table of contents (toc)
- ✓ List of figures (lof) and list of tables (lot) (could also be added at the end of the thesis before the references)
- ✓ Text:
  - Introduction and Motivation
  - Literature review
  - Experimental techniques
  - Results and Discussion (inclusive error discussion)
  - Summary/Conclusion
  - Bibliography
  - Appendix (if necessary, in consultation with supervisor)

References:

Any information that you have not obtained yourself must be cited as the source. The used literature is to be identified at the appropriate places in the thesis by consecutive numbers enclosed in square brackets. The consecutive numbers refer to the bibliography. Alternatively, it is also possible to state the authors and the year in the text ([first author, second author, year] or [first author et al., year]). In this case, the bibliography should be sorted alphabetically. When using a book as a reference or a publication which is a part of a bigger collection referencing with the page number(s) used is necessary. For instance, [10, p. 100] or when using information from more than one page [10, p. 100-102]. When referencing from papers the list of references will contain the pages. Using more than one reference within one sentence or section has to be referenced like in the following examples:

- [35, 36, 37] or [35-37]
- combinations: [12, 35-37] or [12, 35, 36 p.100-102, 37-40].

Direct quotes must be enclosed in quotation marks. If a source or several sources are used only within a sentence, the source must be cited at the end of the sentence before the punctuation point. If the source or sources refer to a section or to several sentences, the source reference must be inserted after the punctuation point of the last sentence to clarify the affiliation.

Example:

- "sentence" [35].
- "sentence". "sentence". "sentence". [35]

Example Bibliography (Citavi-style: Journal of Sustainable Metallurgy):

Journal:

[36] Binnemans K, Jones PT, Blanpain B et al. (2013) Recycling of rare earths: a critical review. J. Cleaner Prod. 51:1–22. https://doi.org/10.1016/j.jclepro.2012.12.037

Book:

[37] Hollemann AF, Wiberg E, Wiberg N (2016) Anorganische Chemie, Band 1: Grundlagen und Hauptgruppenelemente, 103rd edn. De Gruyter

In the text:

One or two authors: According to Yuchi and Morimoto "rest of the sentence" [36].
(According to other publications …, According to the authors… and so on.)

More than two authors: According to Yuchi et al. "rest of the sentence" [36].

Not permitted: According to [36], the influence of…

Scope of the submitted theses:

The following page numbers have to be respected (applies to the content section from introduction to summary):

Literature work:	max. 30 pages
Student research project:	max. 50 pages
Engineering internship:	max. 50 pages
Bachelor thesis:	max. 80 pages
Diploma/Master thesis:	max. 100 pages

Number of exemplars to be submitted:

Student research projects as well as diploma and bachelor/master theses must be submitted in tow printed copies and a single digital copy. In addition, all (raw) data in digital form as well as the lab book must be handed over to the supervisor. For other theses, the number of copies to be submitted must be agreed with the supervisor.