



Master Thesis Guideline

Guidelines for curricula design,
organization and implementation

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Date: 2020-11-12

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1. Introduction

An essential part of the study at the TU Berlin is the preparation of scientific work, such as bachelor or master thesis. The following guide will help to avoid content and formal errors and assist in the process of creating such works. This guideline is binding for writing papers in the department of Energy and Resource Management at the Technical University Berlin. It refers primarily to the preparation of bachelor or master thesis but applies analogously to diploma thesis or other written work in the field of energy and resource management, unless otherwise specified. Please note that some criteria might be treated differently in other areas of expertise. Due to the diversity of scientific work as well as various established scientific practices, there may be exceptions to the rules in this guide. Please refer to the TU AssisThesis Leitfaden (Theuerkauf and Steinmetz, 2009) for more detailed information.

Due to the variety of scientific papers as well as various established scientific practices, exceptions to the rules in this guideline may be useful or even necessary. Deviations are permissible in individual points after early consultation with the supervisor. At some points in this guideline, scope for action in the design of the work is named explicitly, so that they do not require any separate agreement with the supervisor. In general, the guide does not replace communication between you and the supervisor. It is therefore advisable to consult one of the caregivers for individual arrangements. If necessary, please contact your supervisor for an appointment.

This guideline contains information on the course and topic assignment of the thesis, the time planning and processing, the content of the work, as well as the presentation and form as well as principles of the evaluation.

A draft for the design of the title page (0) and the affidavit (0) is included. Attached is a brief summary of the most important formal requirements (A) and additional templates (B). The guideline furthermore contains a declaration to the data transfer, please submit it to the department of Energy and Resources Management (C).

Please see also the document Master Thesis Procedure for specific dates!

2. Procedure and topic assignment

The process of preparing a bachelor or master thesis in the field of energy and resource management consists of several stages. Below you will find important information on the ideal course of this process and the topic finding. It is helpful to seek a topic for the thesis as early as possible during your studies. However, it should be considered that the required prerequisites for the preparation of the thesis are met at the desired start time.

2.1. Preparation and topic finding

At the beginning of the process, you must independently check whether you meet the requirements for the completion of a bachelor or master thesis. Please ensure that this is guaranteed before expressing your interest in completing a thesis.

Please inform yourself whether your degree program requires a colloquium on the final thesis as a separate examination and forward this information to the supervising scientific assistant at an early stage.

In addition, another requirement for the preparation of a Bachelor or Master thesis is that you have successfully completed at least one course in the field of Energy and Resources Management or have taken a comparable course in your studies. In individual cases, this will be coordinated with the potential supervisor.

After these important requirements have been clarified, the next step is the orientation phase and topic selection.

First of all, review the topics that are announced on the Internet pages of the Department of Energy and Resource Management, which you can find [here](#). Usually you will find literature recommendations on the respective topic. These can help you to assess whether the topic is potentially interesting for you.

After reviewing the list of topics, you can decide whether

- You want to choose a topic from the Website of the department (as a rule)
- You are finding your own topic and formulate it within the scope of the departments field
- Or write your thesis within the scope of a practice project in cooperation with an external partner

Regardless of your choice, the first step is to complete the meeting sheet for the preliminary discussion of your bachelor or master thesis and send it as a PDF document to the office of the Department of Energy and Resource Management (<mailto:sekretariat@er.tu-berlin.de>). In this meeting sheet, you name your topic preference or formulate a suggestion for your own topic. You can specify up to three preferences. Please indicate whether you intend to write the thesis in cooperation with an external partner.

If you are interested in one or more of the topics advertised, please contact the responsible scientific assistant by e-mail. She or he will then contact you to make an appointment. If you formulate one or more of your own topic suggestions, your request will be forwarded internally, and a scientific assistant will contact you to make an appointment. It is important that your topic formulation leaves room for an analysis section and has so far been as unanswered as possible in the research landscape. This requirement applies more to master thesis than to bachelor thesis. If you would like to work in cooperation with an external partner, please first contact the external partner and clarify the basic conditions before you report to the Department of Energy and Resource Management. When working in cooperation with an external partner, it must be ensured that the scientific requirements of the field of energy and resource management are observed. If you are thinking of doing a group work, please note the information on suitability on the website of the department. An equal division of the topic is essential for the further group work.

In the preliminary discussion your supervisor will provide you with further background information on one or more of the advertised topics. Alternatively, you can present your suggestions and specify it together. The preliminary discussion serves to clarify further important framework conditions, such as your time schedule or other workload details during your studies. The research assistant will give you further information about the process. Take the opportunity to ask questions during the approximately 30-minute conversation.

2.2. Entry and work phase

Before the start of the official processing period, a thorough examination of the preferred subject through extensive literature studies is recommended. The research assistant will ask you to elaborate a brief outline of the problem as well as a proposal for a rough outline. An extensive literature study, the outline of the problem and the rough classification as a structural framework are basic requirements for the successful handling of the topic and must be done in any case. The outline around the problem should be half of a DIN A4 page or maximum one DIN A4 page. Essential components of this outline are:

1. a brief description of the central object of research,
2. the goal or the central question of the work and
3. the methodology or procedure used for answering the question.

In the rough outline, you also define a preliminary structure for your work. Describe why you choose the headings on the first and second outline level of your work and how this creates a common theme throughout the thesis. Phrase one to three sentences for the directory blocks and outline their level of detail, explaining what ideas are developed in each chapter, what their purpose is and how it helps to answer the research question. This presentation usually consists of two DIN A4 pages. The annotated structure is not binding and can be adapted to individual needs during processing. However, you must discuss adjustments that are more fundamental with your supervisor. You can create the outline of the problem as well as the commented rough outline in the same document. Extensions of the deadline are generally possible for justified applications (TU Berlin, 2014).

Send the structure of the thesis as well as the commented outline per e-mail to the supervising scientific assistant. You will receive a short response, which usually asks you to include some changes. After agreeing on the final draft, you and your supervisor must sign the form 'Application to the Bachelor/ Master Thesis' and send it to the Examination Office.

You will introduce your ideas and structure in the **Kickoff-date** with Prof. Dr.-Ing. Müller-Kirchenbauer and the supervisor will introduce you in about 15 to 30 minutes. Make sure that you orient yourself in your oral presentation of your problem as well as the logic of your structure and your preferences. Please bring with you two printouts of the outline of the problem as well as the coordinated outline that you can provide. You

are welcome to print them on both sides. Please bring along the partially completed registration form for the registration of your work (form handed out by the examination office). Please leave the fields for topic creation and care even further

Again: Please see also Master Thesis Procedure for specific dates!

2.3. Submission/Graduation

Submit your work in triplicate form to the Examination Office. The digital submission can be either at the examination office or in person at the Department of Energy and Resource Management. Please provide a USB stick or alternatively a CD or DVD, with the digital version of your work, all relevant data tables, program files or scripts and the used sources. Find further information on Internet sources in chapter 6.7.

After submitting the work, the presentation takes place in the department. After submission and receipt of your work, the supervising scientific assistant will contact you to arrange an appointment for the final presentation. Normally this takes place around 2-4 weeks after receipt, individual appointment requests can be considered if necessary. In the case of bachelor thesis, 20 min-25 min (+ 10%) and for master thesis 25 min-30 min (+ 10%) are available for the presentation of the thesis. In a group work it should be noted that the scope of the presentation increases accordingly. Note that the focus of the presentation should be on self-performance in and there should not be too much time invested on the theory or introducing the topic, since an experienced audience (including the reviewers) can be assumed. After the presentation, there will be a 30-minute technical discussion in which you will answer questions and discussions.

3. Notes on scheduling and editing

The recommendation is to divide the entire process into three timeslots:

1. preparation, study of literature, outline,
2. the first transcript as well as
3. corrections and fair copy

It is advisable to set up a timetable right at the beginning of the project and to consult with the supervisor. Preparation of the topic in the form of first transcripts can be started, before the material search and material analysis are finished. It is advisable to work simultaneously on the research and the draft of your work. An early written first record makes the results visible, gives an impression of scope and weighting of the work, avoids later time pressure and allows the author to understand their own train of thoughts and shows wrong reasoning and weightings. After processing section 1 and 2 of the lists above, you should go back and consult with your supervisor. After this meeting, the development of the work is suggested as followed:

1. Preparation of the main draft
2. factual and formal revision of the main draft (stylistic refinements, linguistic expression, technical terms)
3. Fair copy with error, citation and literature review

Towards the end, it is important for scheduling that the times for writing and binding are not too short. Calculate enough slack time for the final proof reading and the incorporation of corrections. Continuously make backup copies of your files. If you are collecting data or creating quantitative models, be sure to provide adequate documentation of data and source code.

4. Notes on content elaboration

In this section, some hints are given on the content development. Deviations from the principles outlined here are possible after consultation with the supervisor. However, please consider in advance, whether and to what extent a consultation is necessary and if it is not just a minimal deviation that requires no consultation. Overall, at the end of the work, you should feel that you have contributed to research in the field of energy and resource management and can prove it through your extensive literature work.

4.1. Literature work and research

At the beginning of every scientific work there should be an intensive research of the scientific literature. This can be done online (e.g. via the [library catalogs](#)) as well as on the website of the department. Often there are references to interesting literature in the bibliographies of other scientific papers. Important criteria for the selection of the literature are up-to-datedness, relevance for the processing topic and the reliability of the source. For all statements, the traceability must be ensured. In the processing of the task of a study, bachelor, diploma or master's thesis the topmost principle is that for all statements, the traceability must be secured, only with these strict structures, a scientific work is valid. When using literature from the Internet special requirements apply. When selecting sources, consider the extent to which the organization or author stands for high and trustworthy quality. Find detailed information on the assessment of Internet sources here: Kate L. Turabian (2018): A [Manual](#) for Writers of Research Papers, Thesis, and Dissertations, 9th Edition; Chicago Style for Students and Researchers.

4.2. Notes on structure

The structure of a scientific work results from the subject matter and the methodology and is dependent on the necessary or selected form of presentation. It is advisable to put an introduction to the actual main part. The purpose of an introduction is to inform the reader about the topicality of the problem and the basic classification in the research as well as to outline the basic problem definition and methodical procedure. The purpose of the final section is to summarize the considerations and come to a result (outlook). Every scientific paper must have a summary in the sense of a result. If possible, highlight subtotal results of the study by chapter summaries. Emphasize the overall result (conclusion, outlook) at the end of your thesis. Helpful to understand the work is briefly picking up goals and methodologies for each chapter at the

beginning. Thus, common theme of the work for each reader is recognizable. A chapter should contain at least one page, with exceptions allowed for enumerations.

The content structure determines the length of the chapter and the core idea of a chapter is described within the respective upper point, whereby equivalent sub-points are treated in subsections (example: 2, 2.1 ..., 2.2 ..., 2.3 ... etc.). A paragraph consists of at least two sentences. It reflects a coherent thought. If a subdivision does not appear as a heading in the text, it must emerge unequivocally from the thought process. Although the author has some discretion in creating the structure, note the following (Theuerkauf and Steinmetz, 2009, p. 13):

- Firstly, the outline is an external tool for the editor and the reader. Secondly, it also indicates to what extent one can structure a task in a systematically and objectively correct way.
- In the outline, the author also gives a hint to the thought process and shows the weight that is attached to individual problems.
- The structure must be logical, going from general to the specific points. Outline points of a level must be summarized, and individual parts must be in reasonable proportion to each other. Too many sub items often indicate wrong heading choice.
- Do not divide the thesis into too many points. For bachelor thesis, a maximum of three levels (e.g. 3.2.1), for master thesis a maximum of four levels (e.g. 3.2.1.1) are permitted. As a rough guide the correct outline: text blocks of less than one page are too short; Text blocks of more than four pages are too long (deviations are possible here). It is possible to introduce unnumbered subheadings that are bolded off the rest of the text. If used, a stringent application is required.
- There must be at least two sub-points each, which means at least 1.1.1 and 1.1.2 must be included under 1.1, if a corresponding breakdown is required. After 1.1 the sub item 1.2 follows, which means a subdivision of an outline point is only possible where at least two sub items are identified.

4.3. Notes on the introduction

The first sentence in a scientific paper is always the most difficult. Therefore, you can postpone it until later, or take comfort in the fact that you will be rephrasing it towards

the end of the work. In the introduction, the topic of the work is explained and specified. It should contain the following points, some of which can be in any order and which do not always have to be fully considered in a term paper. Care should be taken that the introduction is not too long (2 to 4 pages). Definitions or similar should take place in the theory section and not in the introduction. The points in the introduction are not necessarily sub-chapters.

Points of introduction:

1. Relevance of the topic: Why does the subject represent a social, economic, or engineering problem?
2. Development of the question(s): escalation of the problem and the questions raised on a question. Presentation of possible hypothesis or thesis.
3. Development of the problem: raise the question or topic that is being investigated.
4. Limitation of the topic: It is substantiated in terms of content and not formal colloquialism (example NOT: "because I did not have more time!") Why the work focuses on an aspect of the problem. The topic is delineated by neighboring topics, study period and location are specified (example: German energy industry from 1990-2005). It is important to outline the framework in which the subject is processed, and keywords introduced correctly (What is foreign policy, which part of Germany is meant?) Note that special definitions are to be noted in the theoretical part.)
5. Presentation of sources and literature: Here it is stated which sources and literature are available (or not). This can be done briefly later at the literature part.
6. The evaluation of the sources and the literature leads to a summary of the state of research. Different perspectives of the scientific discussion on the topic are presented (briefly) and their own approach and problem definition are categorized.
7. An explanation and justification of the methods used and the underlying theories or theoretical assumptions with which the initially formulated question is or will be answered. It should be explicitly described which theories or theoretical assumptions are based on, what the assumed premises are and on which theoretical and social level the investigations are based. (in a short manner!)
8. An explanation and justification of the structure of the work. Why is the work structured as it is in the outline? Justification of logic and concept.

4.4. Abstract

The thesis is to be preceded by an abstract (short version) in a language, which is understandable for itself, on which the whole thesis is presented on about half a DIN-A4-page of continuous text and on the basis of which the reader can get a quick overview of content, method and results of the thesis. In the case of German language papers, it is also possible to write an English version of the abstract. This type of abstract can be structured as follows:

- Problem and object of the paper
- tested questions and hypothesis
- methods used
- important results of the study
- validity range and
- questions for further investigations.

4.5. Main Part

The significant part of the thesis is framed with in the main part, whereby it's structure and contents are dependent on the object of investigation, problem formulation and method. Mostly it is subdivided into a basic or theoretical part, an implementation or method part and a result part. In the basic part, the work is embedded in an existing scientific context in which relevant theoretical backgrounds and the state of research are discussed. In the theoretical part, however, no extensive exposition of elementary foundations is required because the work addresses a knowledgeable readership. This part is followed by a description of the own procedure in the implementation section. This results in the division of work into the basic part (theory), implementation part (used method of work) and presentation of results (Theuerkauf and Steinmetz, 2009, p. 99). Finally, the critical appraisal of the results should be made. As a rule, the results are summarized in a summary. Furthermore, an outlook is given on future developments and / or further research needs.

5. Notes on presentation and form

The quality of a scientific work depends not only on the thoughts it contains, but also on its proper presentation by the author. The following points should give an overview. Deviations from these must always be discussed with the supervisor!

5.1. Style of writing

Under certain circumstances, the reference to real companies can be eliminated (please consult with the supervisor), the company name and company-specific abbreviations or designations must be removed or changed. The company can be described in the work as "the considered enterprise". Only after consultation with the company can the company name be mentioned. The guidelines for a good scientific writing style should be observed and be taken from the relevant literature. Own judgements must be separated from factual claims (Theuerkauf and Steinmetz, 2009, p. 83). Evaluations and assertions are to be substantiated by appropriate sources or to be derived in detail. Pay attention to logical and non-erratic sequences of thoughts, use clearly understandable and meaningful words and sentences. Avoid too long sentence constructions. As a rule of thumb, the limitation applies to a main clause and at most a subordinate clause. Use abbreviations sparingly and insert them with the first use of parenthesis and an entry in the list of abbreviations (Bänsch and Alewell, 2009, p. 25).

5.2. Formatting

The work must be done with a suitable word processing system (e.g. MS Office, Open Office, Libre Office, LaTeX...). Figures and tables should be included as far as possible in the text. It is important that illustrations or tables are meaningful to allow the facts to be explained better. To "improve the appearance" they are not useful to use. Illustrations and tables should be self-created as far as possible. The following formal requirements apply to the design of the work:

- Page format: DIN A4
 - title page, affidavit and abstract printed on one side
 - start of double-sided printing with table of content; arrangement of table of content
 - start of text and bibliography on the right-hand side (if necessary, by inserting blank pages)

- Spacing: 1.5; In tables, in bulleted lists or in figures, deviating smaller line spacing (at least single line) is allowed
- Margins: 3 cm left, 2 cm right, 2,5 cm top and bottom; Page numbers within the margin and at least 1 cm from leaf margin.
- Font size and type: Times New Roman (12pt) or Arial (11pt), footnotes 10pt (equivalents also when using LaTeX); Figures and tables allow smaller font sizes (at least 9 pt.)
- Use block justification, but look for blanks, so use (automatic) hyphenation; Deviations from this are permitted for lists, tables or figures
- Page numbers (delimitation of directories and attachments by non-Arabic numerals)
- Header with chapter numbering and chapter heading
- The year, author and title are noted on the spine of the book (B)

The following should be noted when formatting the table of content:

- Decadal classification, single or last digits without a dot: 1, 1.2
- Do not underline outline points
- Highlighting by varying the line spacing, font size and / or boldface, no capitalization, no font variation.

The page numbers of parts 3 to 5 from the following chapter 5.3 are numbered in small roman numerals, starting at I. Parts 1 and 2 do not receive page numbers (and are not counted). The numbering of the actual text is done with Arabic numbers, starting at 1. Each separate attachment is overwritten with a capital letter and the pages are numbered with large Roman numerals, starting at I. In addition, the work (identical!) must be submitted in electronic form (on a USB stick, a CD or DVD). The scope of a bachelor thesis must be 40 pages (+/- 10%), including the figures and tables contained in the text and excluding all lists and appendices. A Master's thesis is 80 pages (+/- 10%), including the figures and tables contained in the text and excluding all lists and appendices. For work done in the context of events, there are different guidelines for the size of the master thesis.

5.3 Arrangement of the parts of the work

The individual parts of the work are arranged as follows:

1. Title page (see 5.4)

2. Affidavit / Declaration of authorship (see 5.4)
3. Abstract
4. For works in other languages: German summary in the style of an abstract (also possible at the end)
5. Table of content
6. List of Abbreviations, Figures and Tables
7. Potential foreword
8. Text (introduction, main part, conclusion)
9. Bibliography
10. Potential appendix

Additional directories (lists of sources of law, list of interviewed experts, ...) are possible, if they are useful, and to be inserted after the bibliography. A breakdown of the bibliography by publication type is possible but is not required. Annexes should be referenced in the text at the appropriate place. If extensive annexes are attached, a separate annex list can be inserted after the bibliography or other additional directories. Data attachments etc. are to be reduced to the essentials. Electronic attachments can be found on the last page of the annex.

5.4 Title page and affidavit

The following are samples for a title page of a scientific paper and an affidavit. The text of the affidavit must be taken word-by-word. It must be inserted on the first page of the paper (after the title page).

Title of the Thesis

Subtitle of the paper

Free scientific thesis to obtain the degree of a Bachelor/Master of
Science

By

Name Surname

Matrikelnumber: 123456

Technical University of Berlin

Faculty VII Economics and Management

ITM Institute for Technology and Management

Chair of Management of Energy- and Resources

First supervisor: Prof. Dr. J. Müller-Kirchenbauer

Second supervisor: Name Surname of the research assistant

Date of submission

Declaration of authorship

By: surname, name

Matrikelnummer: 123456

I affirm that I wrote the master thesis on my own without any assistance of third persons and without other resources and sources as denoted in my work. I indicated all parts which I integrated by wording or by meaning. This work was not in part or in all issue of other examination procedures and was not submitted to other examination authorities.

(place, date)

(signature)

5.5 Illustrations, Tables and Formulas

Illustrations should not be created no reason, but only where they can express facts more clearly or with less effort than pure text. Illustrations must be related to the text, i.e. they must be mentioned and explained there. Each illustration must be numbered and identified (number in the illustration or table, reference in the text with the illustration number). The arrangement of the illustrations as well as the consecutive numbering are based on the order of appearance in the text. The illustration numbering should include the chapter number (e.g. Figure 5.3 corresponds to the third illustration in chapter five etc.). If possible, the figure should appear on the page on which it is mentioned for the first time. If this is not possible for space reasons, it must be placed directly on it, i.e. usually on the top of the next page. If an illustration is referred to again in the text, the page number or chapter number of the illustration must be stated.

Illustrations that are not important for the immediate understanding of the work are listed in the appendix. The same applies to sequences of illustrations that extend over several pages and thus would visually tear the work apart (e.g. flow charts of programs or very large site plans). Computer programs, computer printouts in table form, etc. are also to be included in the appendix. If many identically structured illustrations are used, preferably representative illustrations for the actual text should be selected to illustrate the analysis system. Others can be listed in the appendix of the paper or attached to the electronic data appendix.

The illustrations and tables should have a uniform appearance as far as possible, e.g. in the case of self-created illustrations always an identical font, all with or without frames, uniform marking of certain areas, etc. Illustrations that need to be rotated should be readable from the right. The illustration designation below or on the illustration should be identical to the font used in the text.

The sources of the illustrations should be listed below the illustration (according to the citation method used). However, these do not appear in the list of illustrations. Self-created illustrations can be designated as sources with the designation "own presentation" If no source is indicated, it is assumed that the illustration or table was created by the user. For tables the same applies as for illustrations, but table labels must be placed above the table. As far as possible, SI-units are to be used in the work, deviations are to be justified. They should be explained at the first publication; for larger amounts, a formula directory or a glossary should be created (whereby an explanation in the text is not necessary).

5.6 Citation Method

At every point in the elaboration it must be clear whether the author is taking over his or her own work results, his or her own opinion or that of another author. The reproduction of a foreign representation can be made literally (in quotation marks), by choosing the subjunctive (indirect speech) or in the indicative, but it must be clearly indicated by reference to the source. In principle, the quotation should be as indirect as possible. Direct quotations are to be used

when the exact wording is of relevance, for example in definitions or the interpretation of legal texts.

Literal quotations must be marked by beginning and closing quotation marks. The source reference is placed after the closing quotation mark. The wording is to be adopted the same for direct quotations (including formatting, such as boldface and even including the adoption of spelling mistakes or errors in content). Changes to the wording are to be made using square brackets. Modifications are to be supplemented by a comment such as " emphasis by the author "to highlight the source. Literal quotations should be used sparingly. If possible, foreign-language quotations should not be included in the main text but should be reproduced with reference to the corresponding passage (this does not apply to papers written in English).

In the case of indirect quotations, it is important that the relationship between the statement in the work and that in the source used is clear. Indirect quotations are distinguished from direct quotations by the fact that they are not placed in quotation marks and that the wording has been modified compared to the original, while the content remains the same. For example, if the footnote reads Schulze (1995), p. 23, this means that the content of the indirect quote is found on page 23. If the source supports only a part of your statement or takes a different case, this must be recognizable from the wording or requires additional explanations within the footnote. Additionally, it is important to make sure that the footnote starts at the right place in the sentence to clearly indicate which part of a statement is supported by the quote. If several connected sentences in a paragraph are taken from one source, this must be indicated by additional information such as Meier (1985) or similar. Strictly speaking, this is an invitation to the reader to compare a work or a text passage and is not intended to identify indirect quotations. Nevertheless, a use to mark indirect quotations in the context of final thesis in the department of energy and resource management is harmless, if it is strictly applied.

The quoted text is given a footnote, which is listed at the bottom of the same page. The footnote includes an author's abbreviation including year and page number, e.g. Meier (1985), p. 345. Especially for federal ministries and institutions, the short forms of the name in the footnote should be used, e.g. BMWi (2017). In the bibliography, the abbreviation is dissolved, and all bibliographic references are noted under Meier (1985). Footnotes are numbered throughout the entire work. This also applies to footnotes that contain an explanatory text. Please note that a reference to several sources must be made in a footnote. This means that it is not allowed to place several footnotes at one position. An exception can be a footnote with explanatory content and one for the literary content, whereby this must be checked in individual cases. Instead of ff. page numbers for the used literature are to be specified if possible. However, the use of ff. is permissible, provided it is applied continuously. Multiple sources of literature by different authors are to be delimited by semicolons. If there are several sources of the same author, it is enough to separate them by commas.

If the author uses content and does not cite it correctly, this is a violation of copyright and the work can be considered plagiarism. The same applies to the concealment of used sources. Therefore, the correct way of citing is of great importance (Theuerkauf and Steinmetz, 2009, pp. 9f, 28). Deviations from the regulation mentioned here (footnotes) are permissible and must be discussed with the supervisor, whereby a consistent scientific way of citing is necessary. The use of a literature management program is strongly recommended.

5.7 References

The task of a bibliography in scientific papers is not only to give account about the use of other author's work, but also to show the breadth and depth of the covered section of science. Primarily, the reader should be able to evaluate previously unknown titles and to inspect the listed literature not only for control purposes. Therefore, all bibliographical information that can be taken from the title page and, if applicable, its back page, should be listed. This also includes ISBN, ISSN or DOI.

It is not advisable to try to create a favorable impression by listing as much of the bibliography as possible. Each recorded title allows to make a corresponding claim to the work. The bibliography at the end of the paper therefore only lists those sources that are referred to in the text in footnotes (or, in case of a discrepancy, accordingly), in alphabetical order of authors.

The following information are required in detail:

- surname and first name of the author(s) (if no author is known: n.n. ; academic degrees and titles are not mentioned), if there are more than three authors, only the first one with the addition et al. (= et alii, lat. and others) can be included (attention must be paid to uniformity); if possible, the names of the authors must be used. If no authors are named, the institution to which the authors can be attributed should be indicated,
- Title of the work or essay (for articles in journals or collective works additionally in: Title of the journal/collective work - in the case of collective works, the name of the editor must also be given before the title, with the addition of Ed,)
- Name and first name of an editor or translator (if required),
- Volume, edition (if necessary),
- Place of publication (not for magazines - if there is more than one place of publication, the first one is sufficient),
- Publication date,
- if necessary, first and last page or column of the essay,
- if applicable, number of the issue, the magazine,
- ISBN or DOI where available.

If sources are quoted from the Internet, traceability must be ensured as well. This is only guaranteed by saving the cited pages. For this purpose, the browser's Save function can be used, for example. The .mhtml format is suitable for saving Internet pages, since images are embedded in the file and relative links are resolved.

to ensure traceability the file name should correspond to the quote (e.g. Müller(2015b) is saved as Müller(2015b).mhtml). As an alternative to .mhtml, an online copy of the web page (as PDF or .html) can be saved and the naming can be done automatically. This is enough, even if information about the formatting of the page is lost. The URL and last access date must be indicated in the bibliography. If available, the last update date of the website must be indicated. In the case of grey literature (e.g. reports of ministries or authorities published on the Internet), if print copies are available, the indication of URL, access date, etc. is not necessary. Further information on the use of Internet sources can be found in Rossig/Prätsch (2001). The files are to be handed in on a USB stick, CD or DVD with the work, where appropriate. A bibliography can be broken down. The following breakdown will usually be enough, but can be supplemented according to individual needs:

1. comments, books, dissertations
2. articles in collected editions, magazines and newspapers
3. other sources.

If symbols from external sources are quoted (e.g. in formulas), these must be adapted to those used in the thesis or the deviations must be explained. It is recommended that the first name of the author is written out in full. Further first names can be abbreviated with the first letter. If there is no danger of confusion between several authors, the abbreviation of the first name of one author is also permissible and in this case, must be strictly applied in the work. If there are more than six individual authors, the sixth et al. may be followed by references to other authors. The last author can be preceded by an “and”. The bibliographical data must be used to determine the type of publication of a given entry without explicitly specifying it with the citation style used. Deviations with respect to punctuation and - with restrictions - the order of the entries are permissible, if they are applied stringently and are based on an existing citation style (e.g. Harvard, APA, ...). In individual cases, the supervisor may be consulted.

Several abbreviations are common both in the context of the citation and when bibliographical references are given in the bibliography. Examples of common abbreviations for source references can be found in Table 5.1 (Theuerkauf and Steinmetz, 2009, p. 62).

Table 5.1: Overview of common abbreviations

Abbreviation	Long form	Abbreviation	Long form
Rev. Ed.	= Revised editions	yr.	= year
Vol./ Vols	= Volumes	n.d.	= No date
Et al.	= And others	Trans.	= Translator(s)
Diss.	= Dissertation	p./pp	= Page(s)
Doc.	= Document	n.p.	= No page numbers
Comp.	= compiled	col.	= Column
ff.	= Following pages	ref	= reference
ed. / eds.	= Editions	No.	= Number
Ed.	= Editor	para.	= Paragraph

It is strongly advised to use a literature management program. This program can be used to create a formally correct bibliography and to ensure that no blind entries appear in the bibliography. Furthermore, these programs can support other processing by structuring and managing tasks and knowledge. The correct use of the program is necessary for this. Examples are Citavi or Zotero, or for LaTeX BibTeX. Others are EndNote, JabRef, Mendeley, ... All literature must be submitted as a literature database (e.g. Citavi project file or similar) afterwards (please discuss exceptions with the reviewers, also see A).

6 Evaluation

Bachelor's, diploma and master's thesis with different topics are difficult to compare, because each topic requires a different structure, a different approach to the specific problem. Accordingly, there can be no universal evaluation scheme for such scientific papers. Nevertheless, a reviewer naturally has standards that he or she applies equally to each work in order to arrive at a fair assessment of all the work. In general, the following criteria are used for evaluation:

1. Topic of the work
 - a. Objective difficulty of the topic and required amount of work
 - b. Significance and formulation of the problem being addressed
 - c. Independence while processing
2. content of the work
 - a. Conception of the research approach
 - b. Systematic problem solving
 - c. Weighting of the work steps
 - d. Result of the work
 - e. intersubjective traceability and reproducibility of the work
3. formal design
 - a. Structure and classification
 - b. Language (no colloquial expressions!)
 - c. Accuracy of illustrations and directories
 - d. Citation, Orthography

7 Literature

Bänsch, A., Alewell, D., 2009. Wissenschaftliches Arbeiten, 10., verb. und erw. Aufl. ed. Oldenbourg, München.

Theuerkauf, J., Steinmetz, M., 2009. Qualitative Anforderungen an wissenschaftliche Arbeiten an der TU Berlin.

TU Berlin, 2014. Allgemeine Studien- und Prüfungsordnung.

A. Overview of formalities

The following lists give an overview of the most important requirements for a scientific paper. **However, it does not replace a complete reading of the guide!**

General notes

- A bachelor thesis is about 40 pages, a master thesis about 80 pages (+/- 10% each)
- There must be text under each heading
- A paragraph consists of at least two sentences
- Don't structure the subchapters too deeply, a maximum of three levels for a bachelor's thesis and a maximum of four for a master's thesis

- chapter 1.1 must be followed by 1.2, i.e. a subdivision of an item is allowed where at least two subitems are shown
- The submission of an electronic version of the thesis as PDF and other documents including all data/ sources used is required. The digital version of the work must be enclosed.

Formatting instructions

- Page format: DIN A4
 - title page, affidavit and abstract printed on one side
 - start of double-sided printing with table of content; arrangement of table of content
 - start of text and bibliography on the right-hand side (if necessary, by inserting blank pages)
- Spacing: 1.5; In tables, in bulleted lists or in figures, deviating smaller line spacing (at least single line) is allowed
- Margins: 3 cm left, 2 cm right, 2,5 cm top and bottom; Page numbers within the margin and at least 1 cm from leaf margin.
- Font size and type: Times New Roman (12pt) or Arial (11pt), footnotes 10pt (equivalents also when using LaTeX); Figures and tables allow smaller font sizes (at least 9 pt.)
- Use block justification, but look for blanks, so use (automatic) hyphenation; Deviations from this are permitted for lists, tables or figures
- Page numbers (delimitation of directories and attachments by non-Arabic numerals)
- Header with chapter numbering and chapter heading
- Leave enough space after a headline (min. 6pt)

Formatting of the table of contents

- Decadal classification, single or last digit without point: 1, 1.2 (and not 1., 1.2.)
- Do not underline bullet points, highlighting by variation of line spacing, font size and/or bold
- No capitalization, no variation of the font

Bibliography

- surname and first name of the author
- If the work does not have an author, cite the source by its title in the signal phrase or use the first word or two in the parenthesis.
- academic degrees and titles are not mentioned if there are more than three authors, only the first one with the addition et al. (= et alii, lat. and others) can be included
- Title of the work or essay (for articles in journals or collective works additionally in: Title of the journal/collective work - in the case of collective works, the name of the editor must also be given before the title with the addition (eds.)
- Name and first name of an editor or translator (if required),
- Volume, edition (if necessary),
- Place of publication (not for magazines - if there is more than one place of publication, the first one is enough),
- Publication date,
- if necessary, first and last page or column of the essay,
- if applicable, number of the issue, the magazine.
- Internet sources: additional references in the list of sources are URL and access date

For the literature work and the structure it is of great advantage to use a literature management program (e.g. Citavi or Zotero), which can communicate via suitable interfaces with office-software (e.g. the Word Plug-in from Zotero, or classical BibTeX exports and the package biblatex when using LaTeX). This prevents that blind entries are included in the bibliography and allows easier organization of literature, e.g. by keywords. The literature used must be enclosed with the paper, e.g. if data is taken from websites or if sources that are not publicly available are used. The last access date for online sources should always be noted.

B. Additional Submittals

Information on the spine of the printed thesis (not the back of the thesis):

- year and month of submission
- Last name, first name(s) as initial(s)
- Title (possibly shortened)

For this purpose, you can simply stick a paper strip of the form shown below over the spine with transparent foil adhesive. This serves the purpose that the work can be found again on the shelf. Illustration B.1 shows an example. Further examples can be seen at the FG. The shape is to be chosen as follows:

YYYY/MM	Surname, Name	Title of the thesis
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Illustration B.1: Labeling the thesis

C. Declaration of data dissemination

For the purpose of scientific development, it may be useful to pass on the paper or excerpts to students working on related topics. It can also be useful to establish contact with other students in order to exchange ideas on a professional level. If you agree to this, we will only pass on the following contents that you have confirmed. We will only pass on the information to students working on closely related topics. We would like to emphasize that all information is voluntary and that you yourself determine the extent to which information is passed on. Please print out this page and hand it in to the E&R department after submitting your thesis. You are welcome to do this on your presentation date. You can revoke this declaration at any time by notifying the department.

- I agree that my work may be passed on in electronic form to students working on a related topic.

- I agree that my e-mail address may be passed on to students working on a related topic and that they may contact me for the purpose of exchanging ideas.

- I agree that additional documents to my master thesis (data tables, computer programs, etc.) may be passed on to students working on a related topic.

(place, date)

(signature)

We would like to point out that the data collected in this form on the basis of Article 6 Paragraph 1 c DSGVO in conjunction with the Student Data Ordinance will be used by us exclusively for the purpose of handling the academic cooperation with you, we will treat it in accordance with

data protection laws and will only store it for as long as it is necessary for the academic cooperation between you and our department.