

Guidelines for completing student assignments in the field Life Sciences

1 General Points

1.1 Objective

Through their academic assignments (i.e., project reports, literature reviews, course work, minor papers, bachelor's theses, and master's theses), students should be demonstrating their ability to work independently on a scientific problem and to present their findings in a suitable way.

1.2 Submission

The formalities concerning submission are essentially based on the requirements of the study programs as well as the supervisors. All assignments must be submitted together with a signed [declaration](#) that it is all a student's own work. In some cases, the work must be submitted electronically via Complesis, possibly together with a scientific poster.

If the student and first corrector (or external partners, if applicable) so consent, bachelor's and master's theses can be published electronically in the ZHAW Digitalcollection (see Appendix 3 for relevant [information sheet](#) as well as the [Declaration of Consent and publication ZHAW Digital Collection](#) for Students). Confidential bachelor's and master's theses are excluded from publication (see the [information sheet on using results](#)). The specific information sheets and regulations of the LSFM department and the degree programs should be consulted well in advance of submitting the thesis (see [StudiWeb LSFM](#)). Please see the [information sheet on the use of generative AI](#).

1.3 Assessment

Assignments will be graded on technical content, methodological approach, structure and presentation, citation, referencing and bibliography of technical literature, language, and general impression.

1.4 Other applicable documents

All information sheets pertaining to project work, literature reviews, semester papers, minor papers, bachelor's theses and master's theses, as well as the information sheet on avoiding plagiarism.

1.5 Further reading

Upon request, the degree programs and supervisors will provide references to further literature on writing scientific papers.

2. Presentation of assignments

2.1 Formatting

The text should be formatted consistently, preferably using a font such as Arial 11pt and maximum 1.5 line spacing.

The content of the work must correspond to the title and task. The title should be short and concise. If needed, this can be further clarified with a subtitle. The title page is to be structured according to the model (see Appendix 2). On the back of the title page, an imprint with the following content should be inserted: keywords, recommended form of citation, name of institute.

In the header, the following information may be included: ZHAW LSFM, type of assignment, author; in the footer, the page number should be indicated.

The choice of active or passive form depends on the assignment and must be determined together with the supervisor.

The choice of the correct tense depends on the function of the relevant part of the text or chapter. Essentially, the Introduction and the Theoretical Background are formulated in the present tense, and the experiments or surveys carried out by the author together with interpretation thereof in the past tense. In the Materials and Methodology section, the present or past tense is used, depending on the subject. In the Discussion section, the present tense is generally chosen for general statements and findings, and the future tense for the description of the future directions.

A clear and understandable writing style is of particular importance. The use of I/we forms, direct forms of address to the reader, laboratory jargon and colloquial expressions should be avoided. [The ZHAW Language Guide](#) provides detailed information on gender-sensitive personal terms and their grammatically correct use.

2.2 Figures and tables

Figures and tables must have either informational or orientation value. Their content and presentation must be described and, if necessary, explained in the text. Reference must also be made to them in brackets in the main body of the text, e.g., (see Fig. 2.).

All illustrations (graphs, diagrams, photographs, etc.) and tables should be numbered consecutively and must include a relevant caption. Figures are labelled at the bottom, tables at the top; the designation is Figure (Fig.) or Table (Tab.). If the figures and tables originate from other authors, the source must be indicated following the caption.

3. Structure

The following structure for scientific papers has proven effective and should generally be adhered to. Depending on the type or topic of the paper (e.g., literature review, business-related topics, etc.), deviations from this structure may be appropriate following consultation with the supervisors.

Decimal numbering should be used for numbered chapters and sub-chapters (for example, 3, 3.1, 3.2, 3.2.1, 3.2.2 etc.). More than 3 sub-levels per main chapter may become confusing.

| | |
|---|---|
| Title page | Design according to template (see Appendix 2) |
| Abstract | Not numbered |
| Table of Contents | Not numbered |
| List of Abbreviations (as required) | Not numbered |
| Introduction | Start section numbering |
| Literature Review or Theoretical Background (following consultation with supervisors) | Numbered consecutively |
| Materials and methodology | Numbered consecutively |
| Literature Review: Methodology (connected to literature review) | Numbered consecutively |
| Results | Numbered consecutively |
| Discussion | Numbered consecutively |
| Bibliography | Numbered consecutively |
| List of images (as required) | Not numbered |
| List of tables (as required) | Not numbered |
| Appendices (as required) (with list of appendices immediately preceding) | Not numbered |

3.1 Information on individual sections

3.1.1 Abstract

The aim of the abstract is to arouse interest in the work and to provide a brief overview of the most important results and findings. Only findings that are presented in the paper are listed. Length: half to 1 A4 page maximum.

The abstract should include all important elements of the work, i.e., the study area, the objective or research question, the research methods, the results and the conclusions. The abstract should not contain any references.

For longer pieces of work such as project papers, bachelor's and master's theses, the abstract must also be written in English. Papers written in English should contain a summary in German in addition to the abstract.

3.1.2 Acknowledgements

Expressions of thanks aimed at proofreaders and possibly also companies are only customary in the exceptional circumstances (e.g., free analysis by a company). This is usually inserted before the table of contents.

3.1.3 List of abbreviations

A list of abbreviations is only useful if the piece of work contains many unusual abbreviations. These should be listed alphabetically and formulated. Commonly known abbreviations (e.g., USA, UN, DNA etc.) should not be included.

3.1.4 Table of contents

The table of contents lists all chapters and sub-chapters, along with their page numbers, but does not include the abstract or the table of contents itself.

3.1.5 Introduction

The introduction is divided into three parts: in the first part, the background, the problem or situation is presented, and the current state of the art of the technology or science is described. Current primary literature should also be included here. In the second part, the research gap or the relevance of the work for research is described. The aim is to show which areas have been neglected so far or have only recently gained in importance. In the third and final part, the objective of the work is stated (if necessary, with reference to the actual assignment) and the research question is formulated as precisely as possible, if necessary, in the form of testable hypotheses. A separate chapter is useful for more detailed presentations of the current state of the art, or for theoretical background or a literature review (see chapter 3.1.6).

3.1.6 Literature review

The literature review presents the theoretical background and models which are used in the discussion section for the interpretation of the experimental data. In addition, any technical equipment that was of particular importance for the work is discussed, along with its advantages and disadvantages. General technical basics are to be omitted here, for example, if the injection technique is of particular importance for a piece of work on gas chromatography, only the different injection techniques should be discussed here; the basics of gas chromatography should be assumed to be known.

3.1.7 Materials and Methodology

In the Materials and Methodology section, experimental design and procedure, materials used (origin, condition, number of individuals, etc.) and analytical methods (including statistical evaluation methods) should be described in such a way that the experiments are reproducible. Any original methods used by the author, new or little-known methods and modifications should be presented in detail. However, already known experiments and methods should not be described explicitly; in this case, reference should be made to the original sources. Where technical equipment and devices are employed, the brand and type designations should be given; illustrations, on the other hand, are not necessary. The author's own constructions should be described. Depending on the type of work, material and methods can also be described in separate chapters.

Should a thesis not include any empirical research (Literature Review), the chapter on methodological procedure should describe how the work was carried out. In the case of database research, the databases used, as well as keywords, catchphrases and logical connections in the search query, the number of hits, the hits used, and the date of the query must be listed. Unsuccessful searches should also be mentioned. After consultation with the supervisors, the chapter can be listed in the appendix.

3.1.8 Results

In the Results section, all results, including those which were unexpected or from failed experiments, should be presented in the most suitable format (text, figures, tables, etc.). If figures or tables are used in addition to the text, only one of these forms of presentation should be chosen (either figures or tables). Interpretations usually belong in the Discussion section. Raw data belong in the appendix. All results presented here should be cross-referenced to the corresponding raw data in the appendix.

3.1.9 Discussion

In the Discussion section, results should be interpreted and critically assessed, i.e., the author's own findings are weighed against each other and compared with those of other authors. In this section, a reference to the task or research question should be made, and it should be clearly shown what the work contributes to the thereof. Recommendations for further action can also be useful.

Exemplary raw data which are referred to in the discussion do not only form part of the appendix but are also inserted into the Discussion section as illustrations.

If necessary, results and discussion can be dealt with together in one single chapter.

3.1.10 Bibliography

The Bibliography (sometimes also References) lists all sources cited in the work and only these. The cited sources must meet scientific criteria, regardless of the publication medium, and in particular must be demonstrably based on scientific data and methods.

The bibliography must be compiled according to the specifications of the citation standard chosen (see Section 4 of this guide). Suggested citations taken from literature management programs (the ZHAW supports [Zotero](#)), databases, library catalogues or publications must be checked for correct compliance with the citation standard chosen and adapted where necessary.

3.1.11 List of Figures and Tables

The List of Figures and Tables section lists all figures and tables by number and with captions. It serves to facilitate locating figures or tables in the piece of work, not to list the sources used for them. Like all other sources, these are listed alphabetically or numerically in the bibliography (see Chapter 4 of this guide). If there are only a few figures and tables, both can be listed together, or a list can be omitted if necessary.

3.1.12 Appendix

The appendix contains, as required, documents whose inclusion would inhibit the readability of the work, or are only important for those readers who are particularly interested, or which are required by the study programs for the submission of the thesis (see Chapter 1.2 of this guide). Normally, page and chapter numbering are not continued in the appendix. If an appendix consists of several parts, these are referred to as Appendix A, Appendix B, etc., or as Appendix 1, Appendix 2, etc. The appendices should be referred to in the text. A list of appendices must be included at the beginning of the appendix.

4. Citing, referencing and listing academic literature

For all findings or statements (including graphs, tables and figures) that are taken from other sources, the reference should be given directly along with the finding or with the quoted or paraphrased statement. In general, the original text quoted should be paraphrased as autonomously as possible. Direct quotations must be enclosed in quotation marks and suitable punctuation used. These are to be used sparingly; longer verbatim quotations (approx. 40 words or 4 lines or more) should be used only exceptionally and separated from the rest of the text for the sake of readability.

Plagiarism, such as passages from sources which have not been identified as such, violates copyright laws as well as the principle of academic honesty and thus also the General Academic Regulations for Bachelor's and Master's Degree Programs at the ZHAW (RPO) (see [Merkblatt zur Vermeidung von Plagiaten](#) – information sheet on avoiding plagiarism and [Merkblatt zur Verwendung von generativer KI bei Arbeiten](#) - Information sheet on the use of generative AI).

There are various citation standards ('styles') for citing the literature used. Two standards frequently used in the natural sciences and social sciences are listed below.

Literature is cited either

- a. with author and year of publication in the text and extended citation in alphabetical order in the bibliography. For examples, see Appendix 1a (Style: APA)
- or
- b. with a number in the text and extended citation in numerical order in the bibliography. For examples, see Appendix 1b (Style: Springer SocPsych (numeric, brackets)).

The choice of the appropriate citation standard depends on the subject area or topic. For example, numerical referencing and bibliography is appropriate for papers in the legal field (e.g., food law), since the legal texts cited in the text cannot be listed by name and year of publication like other sources.

In principle, a citation standard should be chosen in consultation with the subject marker that is established in the subject area concerned. This standard must be applied uniformly throughout the entire work.

Appendix 1a

In-text references with author and year of publication (e.g. Style: APA - American Psychological Association).

In-text references

Citations can be added in abbreviated form consisting of three parts; author, year, page (in brackets and separated by commas), at the end of the sentence (before the full stop) or after a quoted or paraphrased statement. For example: (Müller, 2020, p. 50). Companies and institutions can also function as an author.

Citations can also be mentioned within the sentence; in this case, only the year and page are in brackets after the name. For example: According to Müller (2020, p. 50-52), the causes of climate change are (...). For the sake of clear verifiability, the page number is mandatory, especially in the case of longer pieces of work; this can be dispensed with in shorter texts such as journal articles.

When citing publications with two authors, the surnames are linked within the sentence with 'and', in parentheses with '&'. Should there be more than two authors or editors, only the first name is mentioned; for the co-authors or co-editors, 'et al.' is used.

Examples

Zinc deficiency has only been recognized as a health problem of the world's population since 2002 (Gibson, 2006).

According to Gibson (2006) zinc deficiency has only been recognized as a global health problem since 2002. Hambidge and Krebs (2007) estimate that a large part of the world's population (...).

The same authors confirm studies by Maret and Sandstead (2006), according to which (...). Data from various researchers (Cakmak, 2008; Jen & Yan, 2010) also show that (...).

References in bibliography

References in the bibliography differ according to the type of source, with the title of independent publications (monographs, anthologies, journals, newspapers, encyclopaedias, websites) in *italics*, and the title-dependent publications (articles, journal and newspaper articles, encyclopaedia entries) in plain text. In the case of dependent publications, the page range within the superordinate publication is indicated (e.g. on which pages in the anthology the article is to be found); in the case of articles from specialist journals, the year and issue number of the journal are also indicated.

All sources are listed **alphabetically** according to the names of the authors or editors.

Following the APA (7th ed. 2019) example, the most common types of sources are listed in the bibliography as follows:

Sources may also be in non-electronic form, in which case no DOI (Digital Object Identifier) or URL information is listed.

- **Monographs (Reference work with author):**

Hamatschek, J. (2021). *Lebensmitteltechnologie: Die industrielle Herstellung von Lebensmitteln aus landwirtschaftlichen Rohstoffen* (2. Aufl.). Verlag Eugen Ulmer.

<https://elibrary.utb.de/doi/epdf/10.36198/9783838555058>

- **Journal article (original article, review):**

Jeswani, H. K., Figueroa-Torres, G., & Azapagic, A. (2021). The extent of food waste generation in the uk and its environmental impacts. *Sustainable Production and Consumption*, 26, 532–547. <https://doi.org/10.1016/j.spc.2020.12.021>

- **Contribution (essay) in an anthology (edited work)**

Doering, O., & Sorensen, A. (2018). The land that shapes and sustains us. In J. Eise & K. A. Foster (Hrsg.), *How to feed the world* (S. 46–58). Island Press/Center for Resource Economics. https://doi.org/10.5822/978-1-61091-885-5_4

- **Newspaper article:**

Neubauer, U. (2020, Oktober 17). Maschinen lernen die Sprache der Chemie. *Neue Zürcher Zeitung*, 55.

- **Report:**

Bundesamt für Umwelt BAFU. (2021). *Empfehlungen zur Vermeidung von Lichtemissionen*.
<https://tinyurl.com/e76vsxwp>

- **Research Report:**

Tschopp, M., Beige, S., & Axhausen, K. W. (2011). *Verkehrssystem, Touristenverhalten und Raumstruktur in alpinen Landschaften* (Forschungsbericht NFP 48). vdf Hochschulverlag AG an der ETH Zürich. <https://vdf.ch/verkehrssystem-touristenverhalten-und-raumstruktur-in-alpinen-Landschaften.html>

- **Legal text:**

CH: Bundesgesetz über Lebensmittel und Gebrauchsgegenstände (Lebensmittelgesetz, LMG) vom 20. Juni 2014, SR 817.0, Stand am 1. Januar 2022.

EU: Verordnung (EG) Nr. 1924/2006 des Europäischen Parlaments und des Rates vom 20. Dezember 2006 über nährwert- und gesundheitsbezogene Angaben über Lebensmittel, ABl. L 404 vom 30.12.2006, S. 9-25, konsolidierte Fassung vom 13.12.2014.

- **Norm:**

DIN EN ISO 14501:2021. Milch und Milchpulver - Bestimmung des Gehalts an Aflatoxin M1 - Reinigung durch Immunaффinitäts-Chromatographie und Bestimmung mit Hochleistungs-Flüssigchromatographie.

- **Patent:**

Anissimova, N., & Mathieu, A. (2016). *Method for the production of isoamyl alcohol* (Patent Nr. WO20162072267A1).

Specific types of source

- **Teaching materials:**

Baumer, B. (2020). *Lebensmittelchemie*. Unterrichtsunterlagen ZHAW, unveröffentlicht.

- **Student theses** (veröffentlicht oder unveröffentlicht):

Bezzola, G. A. (2022). *Integration of a microbial fuel cell into a green wall for greywater treatment* [Masterarbeit, Zürcher Hochschule für angewandte Wissenschaften, ZHAW].
<https://digitalcollection.zhaw.ch/handle/11475/25205>

Bruckner, M. (2014). *Entwicklung einer rheologischen Untersuchungsmethode von Teig* [Bachelorarbeit unveröffentlicht]. Zürcher Hochschule für angewandte Wissenschaften, ZHAW.

- **Literature with no named author** (e.g. encyclopaedia article, agency report, material specification): Title instead of author.

Allicin. (2003). In Römpf. <https://roempp.thieme.de/lexicon/RD-01-01588?context=lexiconOverview>

- **Websites:**

Bundesamt für Umwelt BAFU. (2022). *Lebensmittelabfälle*. <https://tinyurl.com/ebpsv4h>

- **Websites without date:** instead of (year) (o.J.) is used

WWF Schweiz. (o.J.). *Unsere Ziele - Gemeinsam Zukunft gestalten*.
<https://www.wwf.ch/de/unsere-ziele>

A statement "Retrieved on date from" is not mandatory and is only required for web pages without a date if these web pages are regularly updated.

- **Personal correspondence** is not referenced directly in the text. It is not listed in the bibliography as it cannot be checked by the reader.

Appendix 1b

Bibliography in the text using numbering system (e.g., Style: Springer SocPsych (numeric, brackets)).

In-text references

In the text, sources are referenced with an associated number in square brackets. The numbers can be placed after the citation, sentence, section, or tables and figures headings. If entire sections are taken from the same source(s), the number can also be placed in the title of the section.

Examples

In climate-based research, the question of whether the climate is a linear or a non-linear system has long been disputed [1]. Research from the last 20 years, especially the highly regarded study by Rahmstorf [2], has been able to prove that (...) [3,4]. His definition of the climate as a tendentially self-regulating system which can suddenly change into a qualitatively different state when reaching a critical point [2] has been sufficiently confirmed by current studies on climate change [5,6].

References in bibliography

In the bibliography, the sources are listed according to their source type, but **arranged by number** and **not alphabetically**.

Example of a numerical bibliography with different source types according to the Springer SocPsych citation standard (numeric, brackets) - numbers and source type information do not correspond in content to the number information of the text examples listed above:

1. Hamatschek, J. (2021). *Lebensmitteltechnologie: Die industrielle Herstellung von Lebensmitteln aus landwirtschaftlichen Rohstoffen* (2. Aufl.). Verlag Eugen Ulmer.
<https://elibrary.utb.de/doi/epdf/10.36198/9783838555058>
2. Jeswani, H. K., Figueroa-Torres, G., & Azapagic, A. (2021). The extent of food waste generation in the uk and its environmental impacts. *Sustainable Production and Consumption*, 26, 532–547. <https://doi.org/10.1016/j.spc.2020.12.021>
3. Baumer, B. (2020). *Lebensmittelchemie*. Unterrichtsunterlagen ZHAW, unveröffentlicht.
4. Bundesgesetz über Lebensmittel und Gebrauchsgegenstände (Lebensmittelgesetz, LMG) vom 20. Juni 2014, SR 817.0, Stand am 1. Januar 2022.



Appendix 2

| |
|--|
| Sample title page (without ZHAW logo) |
|--|

ZURICH UNIVERSITY OF APPLIED SCIENCES

SCHOOL OF LIFE SCIENCES AND FACILITY MANAGEMENT

INSTITUTE OF...

TITLE OF THESIS

(possibly confidential)

Type of work

by

Surname First name

Bachelor's degree programme xxx etc.

Master's degree programme xxx

Submission date

Subject area ...

Supervisors:

(Academic title) Surname, First name (written in full)

Company, Address, Location

(Academic title) Surname, First name (written in full)

Company, Address, Location

Appendix 3

- [Statement of Authorship for Student Work at the School of Life Sciences and Facility Management \(Selbstständigkeitserklärung\)](#)
- [Declaration of consent and release for the electronic publication of a Bachelor's/Master's thesis on the ZHAW Digital Collection at the Departement of Life Sciences and Facility Management \(Einverständnis- und Herausgabeerklärung\)](#)

5. Instruction documentations

The German version of the instructions can be found here: [Abfassung studentischer Arbeiten](#)

5.1 Instruction metadata

| Betreff | Inhalt |
|---------------------------|--------------------------------|
| Responsible for document | Head of the Staff Unit Studies |
| Decision-making authority | Head of Staff |
| Storage location | 2.05.00 Lehre Studium |
| Publication location | Public |

5.2 Instruction version history

| Version | Decision | Decision-making authority | Date of entry into force | Document changes |
|---------|------------|---------------------------|--------------------------|--|
| 1.0.0 | 17.12.2018 | Head of Staff | 17.12.2018 | Layout adaptation GPM |
| 2.0.0 | 11.03.2022 | Head of Staff | 11.03.2022 | Content update |
| 2.0.1 | 04.04.2022 | Head of Staff | 04.04.2022 | Layout adaptation and content update |
| 2.0.2 | 14.07.2022 | Head of Staff | 14.07.2022 | Correction of the link "declaration" |
| 2.1.0 | 01.10.2022 | Head of Staff | 01.10.2022 | Updates of links and corrections / clarifications of references in the bibliography according to specified citation styles. |
| 2.2.0 | 13.12.2022 | Head of Staff | 13.12.2022 | Formal and editorial adjustments. Addition of link to the form "Declaration of consent and publication ZHAW Digital Collection". |
| 3.0.0 | 15.01.2024 | Head of Staff | 15.01.2024 | Additional information sheet regarding use of AI in Section 4. |