Guidelines for writing a Bachelor thesis at the Department of Geosciences at the University of Bremen

Status (Aug. 2021)

The following guidelines are intended to help students and faculty members to orientate when writing and supervising bachelor theses. These guidelines are based on §6 of the examination regulations for the Bachelor of Marine Geosciences program of Feb. 03, 2021.
The bachelor thesis is carried out under the guidance of a supervisor. The time frame for the bachelor thesis is 9 weeks. It has proven useful to plan about the same amount of time for the experimental part / fieldwork and for the actual writing of the thesis - documentation, evaluation, interpretation and discussion of the results - after a short preparation. Before starting the bachelor thesis, the supervisor and the student agree on the working approach. Thereafter the student outlines an exposé in which the objective, preliminary structure and schedule are summarized in his/her own words. The exposé is discussed with the supervisor. The bachelor thesis is to be handed in 3 hard bound copies and one digital copy to the responsible examination office.
The bachelor thesis must comply with the principles of good scientific practice and should be structured like a scientific publication or a scientific report:

Cover Sheet

Title

Bachelor thesis
at the Department of Geosciences
of the University of Bremen

Presented by
Name

Examiners, if applicable supervisor
Bremen,*year*

Table of Contents

Abstract

Concise outline of the content of the bachelor project. The abstract should include information on the research question, methodology, material and results, as well as the main conclusions.

Introduction

In the introduction, the motivation for the present scientific work should be explained. This includes providing brief information on the state of research (using literature) and, based on this, deriving clearly defined scientific question(s) and working hypotheses. Finally, the approach to the research questions can be stated in 1-2 sentences. After reading the introduction, it must be obvious which scientific or practical/applied question is being pursued, why this question is of interest and which strategy is being used to pursue the aim of the thesis. If not mentioned elsewhere, the working group in which the work was carried out should also be mentioned here, as well as any involvement in a research project (name of the project, funding agency).

Scientific knowledge

In this section, the background of the research question and the current state of research are explained, essential definitions are made and offered. In a regional geological work or mapping, for example, this chapter contains a geological overview of the area, as well as information about

topography, climate, etc. The presentation of the literature should be arranged in such a way, that knowledge gaps, that justify addressing the problem, can be identified. It should be noted, that the literature sources are not evaluated at this point. This is reserved for the chapter "Discussion". If necessary, the scientific state of knowledge can also be part of the introduction.

Material and methods

In this section, the method(s) used and the work performed (possibly also the selection criteria) as well as the sample material on which the work is based, are described as briefly as possible and as detailed as necessary (e.g. by using flow diagrams). A repetition of textbook knowledge should be avoided.

Results and interpretations

This chapter contains the statement of your own results, as far as they are relevant for the following discussion. A detailed description of data should be avoided and replaced by the use of graphs and tables. Raw data should be documented in an appendix. If possible, this section should also include an error analysis.
If necessary, the primary data are then converted into physical parameters or environmental conditions. Examples include modeling anomalies from geophysical series of measurements, deriving times from stratigraphic observations or (thermo)chronological data, reconstructing temperature and pressure conditions from thermobarometric surveys or geochemical measurements, determining minerals and rocks from petrographic observations, or surface water temperatures from proxy data. This interpretation can be done in a joint chapter with the results, with the discussion or in a separate chapter.

Discussion

Discussing your own results is the central part of the work. This chapter should therefore be the most extensive one. Here, one’s own results are evaluated and discussed in the context of other papers in relation to the scientific question. The hypotheses set up at the beginning are checked and the own results are compared with those from other works.

Summary and conclusions

In contrast to the short version, the results of the preceding scientific discussion are summarized and a conclusion is drawn. The objectives formulated at the beginning of the paper should be specifically considered. Conclusions resulting from the work should be clearly stated and consequences for use in practice or further research should be presented.

Literature

In a scientific paper, one's own results are evaluated in the context of the existing literature. For this, the origin of the related information must be fully disclosed. Each citation must be verifiable, complete, from original sources (i.e. if possible not indirectly from textbooks or popular websites) and uniformly listed.

Examples for literature list entries:

*Journal article (one author)*Berger, A., 1992. Astronomical theory of paleoclimates and the last glacial-interglacial cycle. Quaternary Science Reviews, 11: 571-581.

Journal articles (multiple authors)
Hay, W.W., Shaw, C.A. und Wold, C.N., 1989. Mass-balanced paleogeographic reconstructions. Geologische Rundschau, 78: 207-242.

Bookchapters
Schreiber, B.C., 1986. Arid shorelines and evaporites. In: H.G. Reading (Hrsg.), Sedimentary enviroments and facies. Oxford, Blackwell Sci. Pub., 189-228.

Book
Pettijohn, F.J., Potter, P.E. und Siever, R., 1987. Sand and sandstone. Berlin, Springer, 553 S.

Bachelor's, diploma and doctoral thesis
Altenbach, A.V., 1992. Verbreitungsmuster benthischer Foraminiferen im Arktischen Ozean und in glazialen und interglazialen Sedimenten des Europäischen Nordmeeres. Doktorarbeit, Univ. Kiel, 111 S.

Formal aspects

The **scope** of a bachelor thesis should be approximately 10,000 words (without appendix). This equals approx. 20 DIN A4 pages with a font size of 11 points with 1.5-fold line spacing. The formatting can be left-aligned or in justified type; if justified type is used, hyphenation should be used. The supervisor makes sure that these boundary conditions are observed. The work should be written in English and must be orthographically and grammatically correct.

The **text** should be clearly, unambiguously and logically structured. It should contain all the information necessary for understanding and thus also enable external experts to understand the investigations and conclusions and to estimate possible errors. It must be possible to distinguish clearly between results/statements of the person responsible and information from literature or third parties (quotations!).

The work should also be **systematically structured** and organized within the chapters. Attention should be paid to the hierarchies of headings. Chapter headings do not belong to the actual text, and text may not be placed in "outline free" space (i.e. between a heading and a subheading).

Applicable **standards** (e.g. for SI units, stratigraphy, geological and geographical units/designations, colour specifications...) must be taken into due consideration, technical terms must be used correctly.

Figures and tables must be numbered consecutively and embedded in the text. Explanatory texts for the figures are always provided below the respective figure. The titles of the tables are always above the table. Reference must be made to each figure and table in the text. The contents of the figures and tables must be discussed.

Acknowledgement is not a necessary part of the bachelor thesis, but it is appropriate in case of intensive supervision and support of an extensive work.

Appendix

Part of the practice of excellent scientific work is to document and archive the data obtained in such a way that other scientists can understand the results of their work. In the appendix, the measurement data that form the basis of derived quantities and graphical representations are to be listed. In case of extensive appendices, an appendix in electronic form is recommended (e.g. as a data carrier, or in a permanent database such as PANGAEA).

Table 1: Guidance on the scope of the individual chapters

Chapters	**Scope**
Abstract	200-300 Words
Introduction	1-2 Pages
Scientific knowledge	1-2 Pages
Material und Methods	15 %
Results and interpretation	25 %
Discussion	40 %
Summary and conclusions	1 Pages