

Evaluation matrix of the master's programme in geology and geophysics

The learning outcomes set for Master's theses are described in the curriculum of the relevant degree programme, which is approved by the faculty council. Master's theses are graded on the following scale: 5 = Excellent, 4 = Very Good, 3 = Good, 2 = Satisfactory, 1 = Passable, 0 = Fail.

- 5 (Excellent): The thesis is of an exceptionally high quality and demonstrates the author's academic maturity, critical thinking skills and thorough familiarity with the topic. The thesis covers all essential issues in a logical order and constitutes a coherent and consistent whole. The thesis meets the requirements set for master's theses excellently in all the areas assessed.
- 4 (Very Good): The thesis is of a very high quality and demonstrates the author's maturity, critical thinking, and familiarity with the topic. The thesis covers all essential issues in a logical order and constitutes a clear and consistent whole. The thesis meets very well the requirements set for master's theses in almost all the areas assessed.
- 3 (Good): The thesis is of a high quality, covers all essential issues in a logical order and constitutes a consistent whole. The thesis meets well the requirements set for master's theses in most of the areas assessed.
- 2 (Satisfactory): The thesis constitutes an understandable and sufficiently logical whole. The thesis has some deficiencies, but meets the requirements set for master's theses in several areas assessed.
- 1 (Passable): The thesis covers some essential issues in a somewhat logical order and is passable. The thesis has many deficiencies, but meets the requirements set for master's theses in several areas assessed.
- 0 (Fail): The thesis is fragmented and illogical and does not constitute a whole. The requirements set for the various areas assessed are not acceptably met.

1. Objective and question setting of the thesis – 10%

- 0: No objective(s) or research question(s).
- 1: Objective(s) and research question(s) are inadequate and/or unclear.
- 2: Objective(s) and research question(s) are not clearly presented or addressed in the introduction chapter.
- 3: Objective(s) and research question(s) are presented in the introduction chapter.
- 4: Objective(s) are stated and the research question(s) are justified.
- 5: Objective(s) are clear and logical. Research question(s) are addressed well and justified according to the scientific/societal demand.

2. Scientific framework of the thesis and use of sources – 10%

- *Mastery of the discipline and geoscientific concepts*
- *Reference selection and use*

0: Geological terms are misused, no established link to existing research in the field. The work does not properly reference sources.

1: Understanding of geological concepts uncertain. References are primarily based on the supervisor's suggestions or study books, reports, and web pages. The work includes paragraphs based on a single reference and the reference list is very brief.

2: Moderate knowledge of research in the field is demonstrated, but that author's own research is not linked to the field. Referencing is appropriate but limited. Salient works are not referenced. The role of the supervisor in the selection of references is significant.

3: Moderate knowledge of research in the field is demonstrated and connected to the author's own work. Usage of terminology is appropriate. References have been used broadly and appropriately. Most of the referenced works are essential and relevant original papers. The student has personally pursued relevant references.

4: The student demonstrates a good command of research in the field. Usage of terminology is correct. References almost completely comprise original papers. The student has personally selected salient references and identified the essential issues in each. Referencing shows the ability of the student to use references for scientific argumentation and to achieve the goals of the work. The student is able to show source criticism in his/her work. Referencing is comprehensive and current.

5: The student demonstrates thorough understanding of the scientific procedure and ties the work to existing concepts meaningfully using appropriate and up-to-date terminology. The student has personally located pertinent references and utilizes the best possible research to support the results of the work. Several timely references are utilized for each theme discussed. The student can distinguish specific knowledge from general. Merits of contradictory references are discussed and evaluated.

3. Data and research method – 10%

- *Selection and description of research material*
- *Choice, sufficiency, and description of research methods*

0: Disorganized or distorted research material is used, and the student's own material cannot be verified. The methods are not applicable nor described adequately enough.

1: The research material is described, but the selection and definition of the research material is ambiguous or lacking. Material is minimal and/or incomplete to tackle the research question(s). The methods are described, but the reasoning for the selection of methods is not justified. The amount of practical work required is not in balance with the thesis (too much or too little produced data).

2: The research material is described, but the selection and definition of the research material is only partly justified. Material is sufficient for tackling parts of the research question(s). The methods are described but may lack sufficient detail to reproduce the work. Application of the methods is vague. The amount of practical work required is not in balance with the thesis (too much or too little produced data).

3: The research material is described, and its selection and adequacy are justified. Material is appropriate for answering the research question(s). The methods are described and justified. Application of the methods is appropriate, in general. The description of the methods is mostly complete, but some minor details may be missing. The amount of practical work required is somewhat in balance with the thesis.

4: The choice and adequacy of the research material are well justified. The material is well suited to answer the research question(s). The methods are well described, justified and clear enough to reproduce the work. The amount of practical work required is in balance with the thesis and the practical work is conducted according to established scientific practices.

5: The research material is comprehensively described, scientifically legitimate, and ideal for answering the research question(s). The methods are also comprehensively described and scientifically sound, describe all the steps needed to replicate the work, and have been used appropriately. The amount of practical work required is in balance with the thesis and the practical work is conducted according to established scientific practices. The methods used are state-of-the-art.

4. Presentation of the results of the thesis – 15%

0: Results are not identified or correctly presented.

1: Presentation of the results is superficial, inadequate, and comprises unprocessed raw data. The illustrations, tables, and text are not linked to one another or are inadequate. Results are difficult to distinguish from the reference material used.

2: Presentation of the results is logical in most parts but incomplete. The illustrations, tables, and text are predominantly linked together and justified. The student's own results do not always stand out from the reference material.

3: Presentation of the results is logical with no major flaws. The illustrations, tables, and text are mostly linked together and justified. Results are presented appropriately (numerically, graphically, or verbally). The student's own results stand out from the reference material.

4: Presentation of the results is logical and clear. The illustrations, tables and text are linked together and support each other. The results are illustrated meaningfully. The student's own results can be clearly identified from the reference material.

5: Presentation of the results is logical, clear, and innovative. The illustrations, tables, and text are linked together and clearly support each other. The results have been skillfully presented utilizing numerical, statistical, and graphical means and graphical artwork. The student's own results are presented perceptively according to the best practices of discipline.

5. Reflection and conclusions – 25%

- *Results and their significance for the research question(s)*
- *Discussion, conclusions, and broader significance of the scientific/practical results*

0: Failed to connect results from the data on hand to the research question(s). Conclusions are incorrect or missing. No underlying scientific argument.

1: The presented results are unrelated or not significant for the research question(s). The research question(s) remain unanswered. Conclusions drawn from the results are very weak, imaginative, or based on unverified sources.

2: The presented results are not related to the research question(s), however some may be relevant and significant to the research question. Conclusions drawn from the results are presented but they are not related to existing research in the field.

3: Results and interpretations are discussed, and they are related to the research question(s). Results and interpretations are also compared to existing research. Scientific arguments are presented, but they are weak.

4: The results and their presentation are comprehensive and relevant for addressing the research question(s). Conclusions from and interpretation of the results are scientifically legitimate, and the student is able to prove their research expertise in the field through scientific argumentation. The reader is able to draw conclusions from the presented results.

5: Data significant to the research question(s) are presented accurately while being thorough yet concise. The scientific discussion is exceptionally insightful and based on a comprehensive understanding of the concepts in the pertinent research field. The research question(s) are answered conclusively. In line with the best works, the thesis is a valuable contribution to the discipline and suitable for publication in a scientific journal.

6. Thesis as an academic text – 10%

- *Structure and coherence*
- *Referencing*
- *Illustrations and tables*
- *Language*
- *Layout and finalization*

0: Headings do not relate to the text. The work uses published material without proper referencing. Illustrations and tables are illegible and/or numbered incorrectly, and they are not referenced in the text. Captions are irrational and they do not contain references. Grammatical errors are frequent, and the text is difficult to read and understand. Discipline-specific terminology is lacking. The layout is sloppy.

1: The work addresses the topic outlined in the title, but the structure of the work is illogical. The work meets the regulations of the scientific ethics and referencing (TENK) and does not violate copyright laws and regulations. The list of references and citation styles has flaws. Illustrations convey too little or too much information, are of poor quality, and not connected to the text. Captions are not understandable without reading the main text. The text contains many grammatical errors, and the sentence structure is challenging. Scientific terminology is mostly incorrect. The formatting of the work is inconsistent, and it is assembled without care.

2: The structure follows the master's thesis writing guide, but the text progresses illogically in places. The reference style and list have flaws. Tables and illustrations are complete (e.g., maps include a north arrow and coordinates) and referenced in the text, but the number of them is not appropriate. The technical quality varies. Captions are inadequate. Language is mostly fluent but written in the style of a report. Some grammatical errors may be present. Scientific terminology is not always correct. The work has a clear structure but is not consistent regarding layout and finish.

3: The work proceeds logically with relevant topics presented in the correct sections. Some information irrelevant to the research question is present. The style of references in the text and reference list are mostly correct. Most illustrations and tables are relevant and referenced in the text, but their quality and relevance vary. Captions deliver essential information, but the main text is still required to understand the message. Language is fluent and grammar mostly correct, but parts may be in the style of a report. The work contains some minor formatting inconsistencies.

4: The text proceeds logically between paragraphs without losing the context, but some incoherence issues are present (e.g., the introduction begins with issues too far or too close to the topic or the introduction may present concepts that are not revisited later in the text). Only minor issues exist in the reference style and/or list. Illustrations and tables are mostly made by the student, relevant, and their appearance is uniform. Captions convey salient information, including explanation of all abbreviations. Language is fluent, coherent, and scientific, and with an appropriate structure. Scientific terminology is used correctly. The overall layout is consistent.

5: The text proceeds logically between paragraphs, and the whole structure of the work is clear and logical. Irrelevant text is not present. The reference style and list of cited works is free of flaws.

Tables and illustrations are understandable independently without a need for reading the main text, have been made by the student using current techniques, and display relevant information clearly and perhaps innovatively. Captions are clear and describe illustrations and tables concisely. Language is fluent, clear, correct and scientifically very polished (and potentially publishable). The visual presentation of the work is mature and consistent throughout. Finalization of the layout and style is excellent.

7. Working during the thesis process – 20%

0: The work is unfinished.

1: The work was completed after considerable delay and urge. The student was incapable of mastering the applied methods independently.

2: The work was finished late and progressed largely due to supervisor input. The thesis text may be out of date. It is clear that it was difficult for the student to master new methods. The work was repeatedly stalled by problems unfamiliar to supervisor.

3: The work was completed roughly within the planned timeframe. The student was capable of learning new methods.

4: The work was completed on time. The student showed responsibility for progress, learned new methods, and solved problems under supervision.

5: The work was completed on time. The student showed responsibility for progress, learned new methods, and solved problems independently and innovatively.