Cartography M.Sc.

Information for students about the Thesis Defense

Valid as of 1 January 2024

To ensure equal treatment for all Master's students the TAB is requested to adhere to the following:

1. The MSc Research exam must be performed in accordance with the Examination Regulations for the Master's programme Cartography, and if required, in accordance with the local Education and Examination Regulations of the partner university at which the thesis is written (i.e. the university that employs the first supervisor).
2. The TAB is appointed by the Examination Board and is accountable to that Board.
3. The objectives of the MSc Research are that the student must be able to:
    - Address a well-formulated relevant research problem of sufficient scope and depth related to the focus of the Master's programme in Cartography and linked to relevant literature (scientific scope and depth);
    - Undertake research with a clear and transparent methodology with proper use of concepts, methods and techniques (scientific method);
    - Write a concise, logical, well-structured and readable thesis report with a clear layout, describing and discussing the key elements of the research process, the findings and recommendations (reporting);
    - Orally present and defend the research and use proper argumentation in the discussion with the TAB about the research (presentation and defence);
    - Work in a structured and rather independent way, while making adequate use of the guidance of the supervisor(s) (process).
4. The TAB is expected to assess the MSc Research on the basis of quality criteria only. Mitigating circumstances should not be taken into account while determining the mark. The assessment is absolute. Each student is assessed on his/her individual performance; not related to the average performance of the other students in the programme). Criteria for assessment are outlined in Appendix 3 below.
5. At least two members of the TAB must be present at the MSc Research exam (the local Chair and one of the supervisors). In case the local Chair is the first supervisor of the candidate, the Examination Board can appoint another TAB Chair to replace him/her. Supervisors may also attend at a distance through video conferencing.
6. The assessment of the written thesis receives the highest weight compared to the thesis defence and assessment of the learning process.
7. Only the final outcome of the MSc Research exam will be communicated to the student by the Chair of the Thesis Assessment Board. Opinions of individual TAB members are never communicated.

MSC RESEARCH EXAM PROTOCOL

Prior to the MSc Research exam

1. In cases where the TAB member is of the opinion that the thesis is clearly indefensible (i.e. a Fail mark is inevitable); this should be communicated to the TAB Chair and the Thesis Coordinator for further action (which may include that the student does not defend the thesis).
2. Prior to the exam the first supervisor certifies that the thesis is not plagiarized. In case plagiarism is suspected the TAB chair informs the Thesis Coordinator and the Examination Board.

The MSc Research exam

1. The Thesis defence is public and will be announced as such.
2. The duration of the exam is 60 minutes including a presentation of not more than 20 minutes by the student, followed by a discussion of not more than 30 minutes. This is followed by a short retreat for discussion of the mark by the Thesis Assessment Board and feedback to the student.
3. The Chair ensures that all members of the TAB get a chance to ask their questions in the discussion, starting with questions from the reviewer.
4. When asking for the opinion of the TAB members on the final mark, the Chair brings in his/her opinion last.
5. The marks are given in the Joined degree marking scale (which is based on the TU Munich scale):

Definition	TUM
Very good	1.0 1.3
Good	1.7 2.0 2.3
Satisfactory	2.7 3.0 3.3
Sufficient	3.7 4.0
Fail	5.0

6. The Chair, in the presence of the TAB only (i.e., not in public), communicates the mark of the MSc Research Exam and the main argumentation to the student immediately after the short retreat. A copy of the 'Final MSc Research Exam' form will be sent later to the student by the Thesis Coordinator.

APPENDIX: THESIS ASSESSMENT CRITERIA

No exact weights are given for the various elements in the determination of the mark of the MSc Research Exam. However, it should be understood that the contents of the thesis itself, i.e., scientific scope and depth and scientific method are the most important criteria in the determination of the mark. Reporting is of secondary importance. The other two elements ('presentation and defence'; and 'process') are to be used for the further adjustment of the mark.

The mark will be determined based on discussion and arguments in the Thesis Assessment Board, using the criteria, as provided below. In determining the mark, it is suggested to follow the following steps:

Step 1: What are the strong and weak points?

Step 2: Does the student pass or fail?

Step 3: How does the student qualify (in terms of "definitions" in the marking table above)?

Step 4: What is the mark (in terms of numbers given in the marking table above)?

Pre-condition to be assessed: The Thesis must comply with accepted standards of scientific ethics (e.g. fraud, plagiarism), applicable laws and the code of conduct for scientific research (e.g. privacy and protection of human or animal subjects).

Mark	Scientific scope and depth
Fail 5.0	There are serious shortcomings regarding one or more of the followings: - No novelty in the research field. - No advancement of insight how the system under study works. - No clear link with the relevant research field.
Sufficient 3.7 / 4.0	There are shortcomings regarding one or more of the followings: - Accepted application with limited novelty in results and discussion. - Introduction or justification of the research topic was there, but rather superficial (e.g. limited literature review). - Results were interpreted, but only to a limited extent. - There was limited advancement in insight in the system under study.
Satisfactory 2.7/ 3.0 / 3.3	Evidenced by the followings: - Good application with some novelty to understand the system under study. - The student can explain and justify the research and interpret most of the results within the context of the discipline. - The student can independently analyse and interpret the research results. - Graphics are informative and increase understanding.
Good 1.7 / 2.0 / 2.3	Evidenced by the followings: - Novelty in application or insight in the system under study. - The student can explain and justify the research and interpret the results within the context of the discipline. - The student independently analysed and interpreted the research results. - Graphics are informative and increase understanding.
Very Good 1.0 / 1.3	Evidenced by the followings: - Clear novelty which brings the relevant research field a step further in terms of knowledge, methods or application. - The student explains the research very well and shows excellent understanding of the system under study. - The student evaluates the results within the research field and is able to relate the results to a wider scope of applications.

Mark	Scientific method
Fail 5.0	There are serious shortcomings regarding one or more of the followings: - The method applied is not appropriate to address the scientific problem under study. - There are serious errors and quality concerns in the data collection process and/or the data used. - There are serious errors and inconsistencies in the analysis techniques.
Sufficient 3.7 / 4.0	There are shortcomings regarding one or more of the followings: - The student has chosen possible techniques and data, but these were not necessarily the best. - The student has difficulty to fully explain and justify choices for techniques, data and assumptions. - The student had difficulties to independently apply standard methods in an appropriate manner.
Satisfactory 2.7/ 3.0 / 3.3	Evidenced by the followings: - The choices to use particular data and techniques are logical. - Choices for data, techniques and assumptions are well justified. - Methods are mostly correctly applied.
Good 1.7 / 2.0 / 2.3	Evidenced by the followings: - The choices to use particular data and techniques are justified and logical. - Choices for data, techniques and assumptions are well justified. - Methods are well explained and correctly applied.
Very Good 1.0 / 1.3	Evidenced by the followings: - The choices to use particular data and techniques are logical. - Clear justification of choices for data, techniques and assumptions. - State-of-the art scientific methods are correctly and independently applied. - There is a clear evidence that the student designed new techniques or combined existing techniques in a novel way.

Mark	Reporting
Fail 5.0	There are serious shortcomings regarding one or more of the followings: - The thesis is incomplete. - The thesis does not comply with an acceptable structure. - The writing style does not allow comprehension of research intents and outcomes. - There is evidence of plagiarism. - There is incorrect use of references. - Not all research questions are answered.
Sufficient 3.7 / 4.0	There are shortcomings regarding one or more of the followings: - The document is organised with headings and captions some of which are non-informative or incomplete. - The paragraph lengths or outlining of the text and graphics are unbalanced. - Visual presentations of results are explained or discussed, but only to a limited extent. - References are made, but of limited use or there are inconsistencies in the application of references. - English grammar and spelling is weak.
Satisfactory 2.7/ 3.0 / 3.3	Evidenced by the followings: - Well readable text (grammar and spelling). - Headings and captions are relevant, informative and complete with at most minor shortcomings. - Generally clear structure but minor improvements are possible in paragraph length and outlining of text and graphics. - Visual presentations of results are relevant and properly explained and referred to in the text. - The citations and references are in accordance with academic requirements.
Good 1.7 / 2.0 / 2.3	Evidenced by the followings: - Readable text (grammar and spelling). - Headings and captions are relevant, informative and complete with no shortcomings. - Generally clear structure. - Visual presentations of results are relevant and properly explained and referred to in the text. - The citations and references are up-to date and in accordance with academic requirements.
Very Good 1.0 / 1.3	Evidenced by the followings: - The thesis is very well written with excellent structure - Negligible or no grammar or spelling mistakes. - All headings and captions are relevant, informative and complete. - References are up-to-date, complete and correctly cited. - The thesis is suited to be converted into a peer reviewed scientific paper or book chapter without major effort.

Mark	Presentation and defence
Fail 5.0	There are serious shortcomings regarding one or more of the followings: - Poor presentation (unreadable visual materials, poorly articulated or poorly timed presentation). - The student is unable to answer questions satisfactorily. - The student is unable to explain and justify the research and research outcomes. - The student shows insufficient understanding of the system under study.
Sufficient 3.7 / 4.0	There are shortcomings regarding one or more of the followings: - The student shows a rather limited understanding of the system under study. - Methods, results and conclusions are explained and justified, but only at a basic level. - The student has difficulties to express him- or herself (poor slides, poor timing of the presentation, insufficient level of English or very nervous) which hampers the discussion.
Satisfactory 2.7/ 3.0 / 3.3	Evidenced by the followings: - The student can explain and justify the research and its outcomes in a presentation. - The student's responses to questions in the discussion are mainly good. - The student is "on-top" of the subject but is not able to go more in-depth or answer questions when these are addressing a wider scope than that applied in the research.
Good 1.7 / 2.0 / 2.3	Evidenced by the followings: - The student can explain and justify the research and its outcomes in a presentation. - The student's responses to questions in the discussion are good. - The student is understand the subject very well but has some difficulties to go more in-depth or answer questions when these are addressing a wider scope than that applied in the research.
Very Good 1.0 / 1.3	Evidenced by the followings: - The presentation of the research is well designed and structured, appropriately timed and very clear. - The student is "on-top" of the subject and shows in-depth understanding of the system under study. - The student responds accurately and correctly to questions. - The discussion goes beyond the immediate research outcomes and also focuses on the wider implications of the research findings.

Mark	Process (for TAB members involved in supervision only)
Fail 5.0	There are serious shortcomings regarding one or more of the followings: - The student lacked initiative and relied excessively on input from the supervisors. - The student did not respond to suggestions from supervisors. - The student did not meet deadlines nor agreements. - The student did not inform supervisors about problems in a timely or complete manner. - The student was not capable of handling set-backs.
Sufficient 3.7 / 4.0	There are shortcomings regarding one or more of the followings: - Limited initiative taken by the student. - The student asked for advice without first making an attempt or gave no indication of having considered possible solutions. - The student does not show a critical attitude and follows advice blindly. - The student asked for advice too late or too early. - There was slow or little follow up on advice from supervisors. - The student had difficulty to meet deadlines or agreements. - The student's dealing with setbacks was usually possible only after intervention by the supervisor.
Satisfactory 2.7/ 3.0 / 3.3	Evidenced by the followings: - The student took some initiative. - Before asking for advice the student tried several ways to solve a problem with some help form the supervisor. - The student needed minor drive (form the supervisor) to ask for help. - The student met most deadlines and followed up agreements. - The student was able to contribute to good discussions about the research during meetings. - The student was capable of handling setbacks with minor help from the supervisor.
Good 1.7 / 2.0 / 2.3	Evidenced by the followings: - The student took initiative. - Before asking for advice the student independently tried several ways to solve a problem. - The student knew when to ask for help. - The student met all deadlines and followed up agreements. - The student was able to contribute to lively discussions about the research during meetings. - The student was capable of handling setbacks independently.
Very Good 1.0 / 1.3	Evidenced by the followings: - The student took initiative. - The student could solve most problems independently. - The student knew when to ask for help. - The student met all deadlines and followed up agreements. - The student was able to contribute to lively discussions about the research during meetings. - The student was capable of handling set-backs independently in novel and creative ways.