

# Guidelines of the Montanuniversität Leoben for the implementation of Master Defenses

June 2024 release

## 1. Preamble

From 01.09.2024, all Master's examinations will be held as a defense. This means that final exams of the Master's thesis already underway and to be completed will also be carried out as a defense.

The conversion of the classic Master's examination, which consists of two subject examinations, to a defense of the Master's thesis reflects the transformation of universities from knowledge transfer to competence transfer. Defenses are now an international standard, making degrees much more comparable and making international interchangeability and cooperation much easier, e.g. within the framework of joint study programs. A defense helps the university to maintain high academic standards and ensure that graduates are well educated and have the professional skills necessary for their professional activities. Likewise, a master's defense is already a good preparation for a defense in the context of a possible dissertation.

The implementation of defenses is a sign of quality for universities, with which they show that they offer high-quality studies in which students acquire the qualified competences. In addition, it is a central concern of the University of Leoben to promote the students' enjoyment of scientific work as well as their confidence in the skills they have acquired and their courage to develop and defend creative technical and scientific solutions.

Defenses have already been introduced within the framework of the joint ("international") and the jointly established master's programs of the University of Leoben, and the extension to the "national" master's programs thus represents a standardized approach and is logical in the sense of a constructive alignment with the doctoral programs of the University of Leoben.

The circumstance that, according to § 78 of the Universities Act, positively completed academic achievements are to be recognised if the learning outcomes do not differ significantly, also calls into question a repeated subject examination, unless there are significant differences with regard to the acquired competences and thus the already documented academic achievements would have to be recognised for the individual subjects of the Master's examination. Likewise, the rapid penetration of science with generative methods of artificial intelligence requires the imparting of appropriate competencies on the one hand, but also new approaches to defend the scientific papers produced on the other.

The reasons and advantages mentioned speak in favor of choosing a Master Defense as the final examination method of all Master's programs at Montanuniversität Leoben, as it enables a more comprehensive and practice-oriented assessment of the knowledge and competencies of the students.

## 2. Advantages and disadvantages of Master Defense

### Advantages

**Holistic assessment of competence and quality assurance:** A Master's defense allows the knowledge and competencies of the students to be assessed more comprehensively, as it enables a deeper discussion and analysis of the Master's thesis. This may reflect the assessment of the ability to solve complex problems better than isolated subject exams. In the course of the (quite permissible) use of artificial intelligence methods in the writing of theses, there is a need to ensure the students' own contribution by means of targeted questions that go into the details of the thesis.

**Presentation and defense skills:** The defense promotes important academic and professional skills such as presentation techniques, scientific reasoning, and the ability to respond to critical questions and defend developed solutions. These skills are crucial for the future careers of our graduates.

**Interdisciplinary approach:** At the Montanuniversität Leoben, which is strongly oriented towards technology and science, a defense can help to integrate interdisciplinary knowledge and demonstrate how different departments work together. This is often more relevant for practice than the isolated knowledge of individual disciplines.

**Topicality and relevance of research:** The defense gives students the opportunity to present the significance and contribution of the scientific work to the respective discipline. The defense ensures that the research is up-to-date and relevant, and that students are working on the latest developments and topics in their field.

**Flexibility:** A Master's defense often offers more flexibility in the design of the exam and can be better adapted to the specific research projects and interests of the students. A Master's Defense offers students and examiners the opportunity to examine the Master's thesis, and thus also the specific research objects and interests of the students, in detail and to stimulate professional discussion.

**Promoting originality, creativity and courage:** Preparing for a defense encourages students to develop original, creative and bold solutions and to pursue their own research approaches, rather than just reproducing existing knowledge. Defenses offer a platform where innovative ideas and new approaches can be presented and discussed.

**Holistic assessment:** A defense allows for a more comprehensive assessment of students' skills and competencies, as it not only asks for theoretical knowledge, but also takes into account the application of this knowledge in the master's thesis. In this way, the critical examination of the scientific question and the methodology used is also promoted and demanded.

**Critical thinking and analysis:** Students' ability to answer complex questions and defend their work shows understanding and depth of knowledge better than isolated exam questions.

**Application-oriented:** Defense is often more practice-oriented, as it allows students to discuss and defend their research in a real-world context.

## Disadvantages

**Pressure and stress:** Especially if the presentation and questioning of the scientific content is a new experience for students, this can contain a potential for stress, as the defense differs from the usual type of (oral) exams. Currently, however, students are already used to presenting and discussing work from courses. This must be implemented and trained more intensively in the context of the courses.

**Presentation anxiety:** Students who have difficulty speaking or presenting in public could be under greater stress. Here, too, education and training can remedy this by creating the necessary confidence in the skills acquired. The competence to present one's own work is an important training goal.

**Intensive preparation:** Preparing for a defense can be very intensive, as students not only have to defend their master's thesis, but also be prepared for detailed questions in the spectrum of their own work. Preparing for a defense may require more time and effort than preparing for two separate subject exams.

**Complex preparation and implementation:** The preparation and implementation of a defense is more time-consuming for teachers than that of oral examinations from the examination subjects. Teachers must prepare and conduct the discussion.

**Evaluation effort:** The evaluation of the defense requires a thorough analysis of both the written work and the oral defense, which requires more time and care.

**Protocol:** A detailed log of questions and answers must be kept, which means additional administrative effort.

**Availability of examiners:** It must be ensured that sufficiently qualified examiners are available.

## Summary

In summary, the Master Defense provides a more comprehensive, practice-oriented and in-depth assessment of students' competencies, promotes important professional skills and supports the development of innovative and creative solutions. It is important to weigh up any disadvantages and, if necessary, take measures to minimize them, such as targeted preparation and support for students, as well as clear and transparent assessment guidelines.

### 3. Master's Examination vs. Master's Defence

In the following, the main differences between a Master's examination and a defence will be presented. Details can be found in Chapter 5.

<b>Master's Examination</b>	<b>Master Defense</b>
<p>Two examination subjects</p> <p>Examination Senate consists of at least three persons. Examination Senate is appointed by the study law body</p> <p>Chairperson has a habilitation.</p> <p>Examiners: usually the course coordinators or persons proposed by them</p>	<p>Choice of examination subjects is not necessary</p> <p>Examination Senate consists of at least three persons. The Examination Senate is proposed by the study programme representatives of the subjects and appointed by the study law body. (This allows students to get in touch with the course coordinator and express their wishes.) Chairperson has a habilitation.</p> <p>Examiners: First examiner must be a member of the MUL; In general, the supervisor is the first examiner (except if the work is carried out at a partner university in the case of joint or jointly established Master's programmes).</p> <p>Second examiner will be registered when registering for the Master's thesis. Investigators must have at least postdoc level. In any case, it is the task of the study program representative to propose suitable examiners who are close to the subject.</p>
<p>Written work will be assessed by the supervisor.</p>	<p>Written work will be assessed by the supervisor.</p>
<p>The presentation of the thesis takes place in the form of a presentation (usually about 5 minutes)</p>	<p>The presentation of the thesis takes place in the form of a presentation (about 15 – 20 minutes)</p>
<p>The survey is carried out by the examiners by asking questions from the examination subjects of the completed degree programme. A reference to the Master's thesis is not mandatory.</p>	<p>The survey will be conducted by the Examination Senate. The questions come from the examiners' departments and refer to the presented master's thesis.</p>
<p>The assessment is based on the assessment of the individual examination subjects (grades 1-5). The overall score is calculated from the rounded arithmetic mean.</p>	<p>The assessment of the defense is based on an individual grade (1-5) after consultation with the examination panel.</p>
<p>An award can be awarded with justification by the Examination Senate according to the previous version of the statutes: <i>"On the occasion of the successful completion of a master's degree, a subject grade must be determined for each examination subject. The entirety of all completed free elective subjects is considered one examination subject. The two examination subjects of a final Master's examination are also considered independent examination subjects. To determine the subject</i></p>	<p>An award can be awarded with justification by the examination board in accordance with the current version of the statutes. <i>"On the occasion of the successful completion of a master's degree, a subject grade must be determined for each examination subject. The entirety of all completed free elective subjects is considered one examination subject. To determine the subject grades, the average value of the assessments weighted by the ECTS points</i></p>

*grades, the average value of the assessments weighted by the ECTS points within the examination subject is first calculated and the grade is determined by rounding this mean value, rounding down in the case of a decimal part of 0.5. If none of these grades is worse than "good" and the number of grades grading "very good" is at least as large as the number of grades grading "good", the assessment in both examination subjects of the final Master's examination is "very good" or in one of these examination subjects is "very good" and in the other "good" or the assessment of the defense is "very good" and the assessment of the Master's thesis is "very good", for example, the final grade "passed with distinction" is awarded for the entire Master's program. In the remaining cases, the final grade "passed" is awarded."*

*within the examination subject is first calculated and the grade is determined by rounding this mean value, rounding down in the case of a decimal part of 0.5. If none of these grades is worse than "good" and the number of "very good" grades is at least as large as the number of "good" grades, the assessment of the defense and the assessment of the master's thesis are also "very good", the final grade "passed with distinction" is awarded for the entire master's program. In the remaining cases, the final grade "passed" is awarded."*

## 4. Implementation of the Master's Thesis

### Topic search and selection of the supervisor team

Topics for Master's theses are either advertised by the chair or students contact the staff of the chair directly. When determining the topic, the language of the master's thesis should also be determined. This is German or English for German-language programmes and English for English-language programmes.

### Registration of the Master's Thesis – Agreement on Implementation

When registering for the Master's thesis, the topic and the supervisor must be determined.

Supervisors of the Master's thesis can be university professors, university lecturers, emeritus university professors, retired university professors and private lecturers. If necessary, research assistants (at least postdoc level) can act as supervisors in research and teaching.

In any case, the supervisor is a member of the university. This supervisor assesses the Master's thesis and can usually also be an examiner (except if the thesis is carried out at a partner university in the case of joint or jointly established Master's programmes).

When registering for the Master's thesis, a second examiner from the above-mentioned group must also be specified.

In any case, it is the task of the course representative to appoint suitable examiners who are close to the subject.

### Duration and scope of the Master's thesis

The curriculum provides for the Master's thesis with 30 ECTS and consists of the actual Master's thesis and the defense. You can assume a scope of 25 ECTS for the master's thesis. This corresponds to a total effort of around 625 hours. With an effort of 40 hours/week, this is the equivalent of about 16 weeks. This means that the thesis should generally be completed within one semester. For this purpose, it is also important to set up a realistic schedule with the team of supervisors and to check it regularly.

The scope and structure of the Master's thesis are generally determined by the chair. The corresponding guidelines of the chair apply.

### Submission and assessment of the Master's thesis

The detailed overview of the submission of the Master's thesis can [be found under https://ssc.unileoben.ac.at/studienabschluss/masterabschluss](https://ssc.unileoben.ac.at/studienabschluss/masterabschluss).

The assessment of the Master's thesis is carried out according to the objective criteria defined by the chair and generally includes the assessment of the content (e.g. achievement of objectives, quality of the theoretical and practical part) and the formal assessment (adherence to the time frame, adherence to deadlines, completeness of the Master's thesis, etc.).

## 5. Implementation of the Master Defense

The effort for the defense can be assumed to be 5 ECTS. This corresponds to a total effort of around 125 hours. With an effort of 40 hours/week, this is the equivalent of about 3 weeks of preparation time.

**Examination date:** The dates for the Master Defense will be set after the submission of the thesis.

**Examination Senate:** The study law body appoints the Examination Board in accordance with the statutes (see point 7) with at least three persons, i.e. the two examiners and the chairperson. The two examiners are generally to be specified when registering the Master's thesis. One of the three persons in the examination board must come from a chair other than the one at which the Master's thesis was conducted. In justified cases, a change of designated examiners can be applied for at the study law body.

**Exam language:** The exam language is generally specified in the curriculum. At the request of the candidate, the defense can also be carried out in English in a German-language degree programme. The language of the examination in an English-language degree programme is English.

**Duration:** The defense should usually not last longer than 60 minutes, including the presentation and questions. The defense should take place in an atmosphere of integrity and fairness. Everyone should have equal opportunities to present and defend their work.

**Presentation:** The student presents his/her master's thesis in about 15 – 20 minutes, presenting the most important goals, methods, results and conclusions.

**Q&A session:** The presentation will be followed by a Q&A session in which the examination board and, if necessary, the other members of the university present can ask questions. (The answers to the audience questions are explicitly not taken into account in the grading.) If an audience question is repeated by the examiner, this is permissible as a grading criterion. The chairman is responsible for deciding on the admissibility of questions in the context of the Master's defense.

**Evaluation:** The evaluation criteria should be clearly defined and communicated to students in advance. These include the quality of the presentation, the depth of understanding, the ability to critically analyze, and the quality of the answers in the Q&A session. After detailed deliberation, the Examination Board awards an overall grade for the Master's Defense. After the defense, the examination board should give the student direct and constructive feedback.

**Record-keeping:** A protocol of the defense, including the questions asked and the answers given, must be kept and archived. The questions and answers should be documented as literally as necessary and as meaningful as possible.

**Avoidance of conflicts of interest:** Examiners who could be in a conflict of interest or for whom reasons for bias apply may not be part of the Examination Board. In this case, the body of study law makes the decision as to whether an examiner is excluded for reasons of bias and, if necessary, appoints a new examiner.

**Spatial and technical equipment:** The defense should take place in a suitable room that offers sufficient space for the examination board, the students and, if necessary, the audience. The room should be equipped with the necessary technical equipment such as projectors, computers and, if necessary, microphones to ensure a smooth presentation and, if necessary, to allow hybrid implementation.

## 6. Excerpt from the “Satzung” <sup>1</sup>

### DEFINITIONS

§ 1. 14) Defensiones are the last examinations before the completion of a regular or non-degree Master's degree or a doctoral programme. They include the defense of the scientific work as well as an expert discussion on the scientific environment of the scientific work.

### DEFENSIONES

§ 29. (1) The final examination of a regular or non-degree Master's degree programme or a doctoral programme is carried out in the form of a defence.

(2) The body responsible for study law shall fill the examination senate for the purpose of holding defences with university professors, university lecturers, emeritus university professors, retired university professors or private lecturers.

(3) The body of study law shall also be entitled to call on persons with a teaching licence at a recognised domestic or foreign university or at another domestic or foreign institution of the same rank as universities to hold defence if their teaching authorisation is equivalent to a teaching licence in accordance with subsection (2).

(4) If necessary, the study law body is also entitled to appoint academic staff in research and teaching as examiners.

(5) Students are entitled to register for the defence if they meet the requirements set out in the respective curriculum.

(6) The curriculum of the respective degree programme may specify more detailed provisions on defences.

### REGISTRATION FOR AND DEREGISTRATION FROM SPECIALIST EXAMINATIONS, OVERALL EXAMINATIONS BEFORE COMMITTEES AND DEFENCES

§ 34. (1) Insofar as the taking of subject examinations, overall examinations before a board or defences is prescribed, students are entitled to register for an examination with the study law body within the specified registration period. The study law body must comply with the registration if the student has proven that he or she has fulfilled the registration requirements set out in the curriculum. If the verification of the registration requirements can be ensured, the body of study law is entitled to provide registration for subject examinations with the examiners. (2) Students are entitled to submit the following applications with their registration:

- a. Person of the examiners,
- b. Examination day and
- c. Conducting the examination in a method that deviates from the examination method specified in the curriculum.

(3) The requests made by the student with regard to the person of the examiners and the examination days are to be taken into account as far as possible. In the case of the second repetition of an

---

<sup>1</sup> IdF MBl. 148. Item 2023/2024, No. 233.



examination, the application for a specific sufficiently qualified examiner from the University of Leoben must be granted in any case. The application for approval of a different examination method must be granted if the student can prove a disability that makes it impossible for him or her to take the examination in the prescribed method and the content and requirements of the examination are not impaired by a different method.

(4) If the registration, the application for a specific examiner is not complied with at the second repetition of an examination, or the application for a different examination method, the body of study law must issue a notice if the student submits a reasoned request for the issuance of a decision in writing.

(5) The examiners shall be made known to the students in an appropriate manner, if possible two weeks before the day of the examination. The substitution of an examiner who is unable to attend shall be permitted.

(6) The registration deadlines for subject examinations, overall examinations before a committee and defences must end at the earliest three weeks before the date of the examination. Students are entitled to deregister from the study law body without giving reasons at least one week before the day of the examination.

(7) Students who are absent from the examination without excuse without serious reasons are only entitled to register for this examination again after eight weeks have elapsed.

## EXAMINATION BOARDS

**§ 35.** (1) For the examinations before a board, the body of study law shall form examination boards.

(2) At least three persons shall belong to a Senate. A member who may not also be an examiner must be appointed chairperson of the examination board by the body responsible for study law. If two examiners are assigned to the same chair, the chairperson of the examination board must be assigned to another chair.

(3) At the last permissible repetition of an examination that is carried out in the form of a single examination procedure, the body of study law is a member of the Examination Board and must preside.

(4) At the last permissible repetition of the defence, the body of study law shall be a member of an examination board which, by way of derogation from subsection (2), shall be composed of at least five members. The body of study law shall preside.

## CONDUCT OF TESTS

**Section 36.** (1) During the examination, students shall be given the opportunity to prove the level of knowledge and skills they have acquired. In doing so, consideration must be given to the content and scope of the subject matter of the courses.

*(Note: para. 1a repealed by MBl. 8th Piece 2021/2022, No. 9)*

(2) Oral examinations are public. It is permissible, if necessary, to restrict access to a number of persons appropriate to the spatial conditions or, if carried out by means of electronic communication, to a number of persons corresponding to the technical conditions. In the case of oral examinations before a committee, every member of the examination board must be present during the entire examination period.

(2a) The obligation of a member of the Commission to be present at oral examinations before a committee within the meaning of subsection (2) may also be fulfilled by connection by means of a videoconferencing system if the following conditions are met:

1. the connection is approved by the chairperson of the examination board;
2. the software system used enables interference-free mutual hearing and visibility during the entire course of the examination as well as the possibility of realistically perceiving the voice, facial expressions and gestures of all participants;
3. a maximum of half of the examination board members will be connected via a video conferencing system;
4. When selecting the videoconferencing system, care must be taken to ensure that the protection of personal data and information security is adequately maintained.

In the cases referred to in § 35 (4) and § 38 (3a), the body responsible for study law cannot be connected via video conferencing system.

*(Note: para. 2b repealed by MBl. 8th Piece 2021/2022, No. 9)*

(3) The examiner or the chairperson of the examination board must ensure that the examination runs smoothly and keep the examination record. The minutes must include the subject of the examination, the place or form and the beginning and end of the examination, the names of the examiner or the names of the members of the examination board, the names of the students, the questions asked, the assessments given, the reasons for the negative assessment and any special incidents. The reasons for the negative assessment must be communicated to the student in writing upon request. The examination record must be kept for at least one year from the announcement of the appraisal.

(4) The data of the examination protocol required for the issuance of certificates shall be transmitted without delay to the Organisational Unit Central Services, Study Support Center.

(5) The deliberation and voting on the result of an examination before an examination board, in the case of several examination subjects with regard to each subject, shall take place in a closed session of the examination board after a discussion between the members. The resolutions of the Senate are passed by a majority of votes, the chairperson exercises the right to vote like the other members of the Senate, but must vote last. When voting on the result in the individual subjects, each member must also take into account the overall impression of the examination.

(6) If the Examination Board does not reach a decision on the assessment of a subject, the arithmetic mean shall be calculated and the result shall be rounded to an integer assessment. A result whose fraction is greater than 0.5 must be rounded up.

(7) The result of an oral examination shall be announced to the student immediately after the examination. If the examination was assessed negatively, the reasons for this must be explained to the student.

(8) If a student discontinues the examination without good cause, the examination shall be assessed negatively. Whether there is an important reason must be determined by the study law body at the request of the student by means of a decision. The application must be submitted within two weeks of the demolition.

By implementing this guideline, Montanuniversität Leoben wants to ensure that the Master's Defence is a structured, fair and valuable part of the Master's programme.

Author:

Thomas Prohaska, Vice-Rector

Thomas Antretter, Dean of Studies

Gerald Pinter, Deputy Dean of Studies

Christian Mitterer, Chairman of the Senate

Christina Waldauf, Lawyer in the Office of the Rectorate

Lucas Weitering, ÖH Department of Education Policy

## Appendix: Possible practical examples:

The entire Examination Senate checks whether the candidate is able to motivate the research question dealt with in the Master's thesis, can justify the strategic problem-solving approach, and understands the meaning/implications of the results achieved.

Master's students in the field of study "Materials Science":

- Master's thesis at the Chair of Materials Physics: Investigation of cyclic crack growth in material XXX.
- First examiner from Lst. f. Materials Physics: Details of the work, fracture mechanics, modern concepts, critical questioning of the applied methodology...
- Second examiner from Lst. f. Metallkunde: Questions about the material examined, heat treatment condition, grain size distribution, how can the crack behavior be influenced positively/negatively.
- Chairman (e.g. from the Lst. f. Structural and Functional Ceramics): Optional: Fracture mechanical characterization methods for brittle materials....

Master's students in the field of study "Plastics Technology":

- Master's thesis at the Chair of Plastics Processing: Evaluation of the use of injection molding simulation to predict the dimensional dispersion of plastic molded parts.
- First examiner from the Lst. f. Plastics Processing: details of the work, technology of injection molding, rheology, shrinkage and warping, simulation tools used, ....
- Second examiner from Lst. f. Materials Science and Testing of Plastics: Questions on the influence of plastic types on dimensional dispersion, determination of material data for the simulation process, effects of different injection molding parameters on molded part properties, ...
- Chairman (e.g. from the Lst. f. Mechanics): Fluid mechanics and basic principles of the simulation of rheological processes.

Master's student in the field of study "Geoenergy Engineering":

- Master's thesis at the Chair of Mechanics on the numerical simulation of the load on the pump rod of a sucker-rod pump during a pumping cycle.
- First examiner from Lst. f. Mechanics: Questions about details of modeling, numerical solution methods, friction, Euler buckling ....
- Second inspector from Lst. f. Geoenergy Production Engineering: Questions about alternatives to Sucker Rod Pumps, advantages and disadvantages, design details...
- Chairman (e.g. from Lst. f. Reservoir Engineering): Optional: Economic significance, savings potentials through the results of the work....