Examination and Study Regulations for the Master's Degree Program in Mathematics at the University of Greifswald

Dated September 24, 2025

By virtue of § 2 paragraph 1 in conjunction with § 38 paragraph 1 and § 39 paragraph 1 of the Law on Higher Education Institutions of the State of Mecklenburg-Western Pomerania (State Higher Education Act — LHG M-V) in the version of the announcement dated January 25, 2011 (GVOBl. M-V p. 18), last amended by law dated June 21, 2021 (GVOBl. M-V p. 1018), the University of Greifswald hereby issues the following Examination and Study Regulations as a statute:

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List of Abbreviations:

Abbreviation	Meaning
AB	Workload in hours
SL	Study achievement (Studienleistung)
D	Duration in semesters
SoSe	Summer semester
HA	Written assignment (Hausarbeit)
TB	Certificate of attendance (Teilnahmebescheinigung)
K	Written examination (Klausur)
Ü	Exercise (Übung)
LP	Credit points according to the ECTS system
Üs	Exercise certificate (Übungsschein)
mP	Oral examination (mündliche Prüfung)
V	Lecture (Vorlesung)
PL	Examination achievement (Prüfungsleistung)
WiSe	Winter semester
R	Presentation (Referat)

Abbreviation	Meaning
*	Supplementary symbol for ungraded achievement
RPT	Regular examination period (semester)
/	or

§ 1 Scope of Application

These Examination and Study Regulations govern the study content, program structure, and examination procedures in the Master's degree program in Mathematics at the University of Greifswald. The Framework Examination Regulations of the University of Greifswald (RPO) dated March 18, 2021 (publicly announced on April 15, 2021) in the currently applicable version shall apply supplementarily.

§ 2 Study Objectives

(1) The Master's examination shall determine whether the candidates are able to independently and in depth discuss and solve mathematical problems, including those with interdisciplinary connections, and whether they are capable of linking scientific knowledge and solutions with practical requirements.

(2) The Master's degree program serves the purpose of in-depth academic and scientific specialization. It is research-oriented and aimed at the acquisition of advanced and specialized knowledge in mathematics and at the introduction to independent scientific work. Students learn to work on complex problems using scientific methods and to make their own research contributions in a subfield of mathematics. The program prepares students for independent professional activity in business and industry or as a scientist at a higher education institution.

§ 3 Admission to Studies and Entry Requirements

(1) Studies in the Master's degree program in Mathematics can be commenced in both the winter and summer semesters.

(2) The entry requirements for the Master's degree program in Mathematics are:

1. a first professionally qualifying higher education degree,
2. the acquisition of 180 CP in a mathematically-oriented degree program, and
3. demonstrated knowledge of English at the B2 level of the "Common European Framework of Reference" or alternatively proof of at least seven years of progressive English instruction at a general education school.

The examination committee shall decide on doubtful cases regarding sufficient mathematical orientation. For important reasons, which the applicant must set forth in writing, the examination committee may, upon application, grant exemption from the requirement under number 2. The exemption may be made conditional upon the fulfillment of additional requirements.

(3) The exemption pursuant to paragraph 2 sentence 4 shall only be refused if successful completion of the Master's program cannot be expected. In this regard, there is a presumption that successful completion of the Master's program cannot be expected if the criterion under paragraph 1 sentence 2 is not met, and the applicant has not provided further evidence of subject-specific and program-specific qualifications from which a positive prognosis of success can be derived upon consideration of the overall picture. The examination committee may resolve to invite the applicant to a clarifying interview. Admission may also be granted provisionally.

§ 4 Structure of the Program

(1) The period in which the program can be completed with the degree of "Master of Science" ("M.Sc.") (standard period of study) is four semesters.

(2) A total of 120 CP are earned in the Master's degree program in Mathematics. The workload required for successful completion of the program totals 3,600 hours, comprising:

- Compulsory elective modules: 84 CP (2,520 hours)
- Seminar modules: at least 6 CP (180 hours)
- Master's thesis including defense: 30 CP (900 hours)

(3) Successful completion of the program requires attendance of the courses offered within the modules. Students are responsible for supplementing the respective contact time through appropriate self-study. The respective instructors shall issue study guidance for each module in a timely manner, in particular reading lists, oriented towards the qualification objectives and the workload of the module.

(4) Without prejudice to the freedom of students to plan the temporal and organizational progression of their studies on their own responsibility, the model study plans (Annex A) are recommended as expedient. For the qualitative and quantitative relationships between the duration of modules and the distribution of credit points on the one hand, and the types of courses and weekly hours per semester on the other hand, reference is made to the module descriptions (Annex B).

(5) After each semester, there is the possibility of completing a semester abroad (mobility window).

§ 5 Types of Courses and Course Offerings

(1) The study content is offered in particular through lectures, seminars, exercises, and internships.

1. Lectures serve the systematic presentation of a subject area; the lecture character predominates.
2. Seminars are courses in which students are introduced to independent scientific work through their own oral and written contributions as well as discussions.

3. Exercises introduce students to practical scientific activity under intensive supervision by instructors. They convey fundamental methods of scientific work in the relevant subject areas and promote the application and deepening of the course content.
4. Internships additionally enable the application of study content in a professional context.

(2) The courses are held in English.

§ 6 Modules

(1) In the Master's degree program in Mathematics, modules from the following subfields are studied:

1. Algebra, Geometry and Topology
2. Discrete Mathematics
3. Computer Science, Numerical Mathematics and Optimization
4. Mathematical Modeling, Statistics and Stochastics

(2) The modules must be taken as follows:

1. At least 9 CP must be acquired from each of the subfields listed in paragraph 1.
2. Two seminar modules must be taken.
3. Beyond this, 6 CP can be acquired from the Professional Internship module (§ 8).
4. 30 CP must be acquired from the Master's Thesis module (§ 9).
5. The "Special Lecture" modules can be selected three times; the seminar modules can be selected four times.

(3) The following modules are offered, from which modules totaling 90 CP must be completed:

1. Subfield: Algebra, Geometry and Topology

Module	D	AB	CP	PL	SL	RPT WiSe start	RPT SoSe start
Algebraic Topology	1	180	6	mP		2nd	3rd
Representation Theory	1	270	9	mP	Üs*	2nd	3rd
Differential Geometry	1	180	6	mP		2nd	3rd
Gauge Theory	1	180	6	mP		3rd	2nd
Functional Analysis	1	270	9	mP	Üs*	2nd	3rd
Complex Analysis	1	180	6	mP		3rd	2nd
Geometry of Spacetimes	1	180	6	mP		2nd	3rd
Homological Algebra	1	180	6	mP		2nd	3rd
Measure and Integration Theory	1	270	9	mP	Üs*	3rd	2nd
Operator Algebras	1	180	6	mP		3rd	2nd
Partial Differential Equations	1	180	6	mP		3rd	2nd
Seminar Algebra, Geometry and Topology	1	90	3	R*		2nd	

Module	D	AB	CP	PL	SL	RPT WiSe start	RPT SoSe start
Special Lecture I Algebra, Geometry and Topology	1	90	3	mP/K		2nd	
Special Lecture II Algebra, Geometry and Topology	1	180	6	mP/K		2nd	

2. Subfield: Discrete Mathematics

Module	D	AB	CP	PL	SL	RPT WiSe start	RPT SoSe start
Discrete Modeling in Biology	1	180	6	mP		2nd	3rd
Discrete Optimization	1	180	6	mP		2nd	3rd
Graph Theory	1	180	6	mP	Üs*	3rd	2nd
Combinatorics	1	180	6	mP		2nd	3rd
Combinatorial Phylogenetics	1	180	6	mP		3rd	2nd
Theoretical Computer Science	1	180	6	K/mP		2nd	3rd
Seminar Discrete Mathematics	1	90	3	R*		2nd	
Special Lecture I Discrete Mathematics	1	90	3	mP/K		2nd	
Special Lecture II Discrete Mathematics	1	180	6	mP/K		2nd	

3. Subfield: Computer Science, Numerical Mathematics and Optimization

Module	D	AB	CP	PL	SL	RPT WiSe start	RPT SoSe start
Approximation	1	180	6	mP		2nd	3rd
Image and Signal Analysis	1	180	6	mP		3rd	2nd
Computer Graphics I	1	180	6	mP		3rd	2nd
Databases	1	180	6	mP	Üs*	3rd	2nd
Data Structures and Efficient Algorithms	1	270	9	mP	Üs*	3rd	2nd
Evolutionary Algorithms	1	180	6	mP		2nd	3rd
Inverse Problems	1	270	9	mP/K	Üs*	3rd	2nd
Convex Optimization	1	180	6	mP		2nd	3rd
Machine Learning	1	180	6	mP	Üs*	2nd	3rd
Numerics of Ordinary Differential Equations	1	180	6	mP	Üs*	3rd	2nd
Numerics II	1	270	9	mP	Üs*	3rd	2nd
Internship Software Engineering	1	180	6	Üs*		2nd	3rd
Robotics	1	270	9	mP		3rd	2nd
Seminar Computer Science, Numerical	1	90	3	R*		2nd	

Module	D	AB	CP	PL	SL	RPT WiSe start	RPT SoSe start
Mathematics and Optimization							
Special Lecture I Computer Science, Numerical Mathematics and Optimization	1	90	3	mP/ K		2nd	
Special Lecture II Computer Science, Numerical Mathematics and Optimization	1	180	6	mP/ K		2nd	

4. Subfield: Mathematical Modeling, Statistics and Stochastics

Module	D	AB	CP	PL	SL	RPT WiSe start	RPT SoSe start
Applied Statistics	1	180	6	mP	Üs*	3rd	2nd
Asymptotic Statistics	1	180	6	mP		3rd	2nd
Bayesian Modeling	1	180	6	mP		2nd	3rd
Bioinformatics	1	180	6	mP	Üs*	2nd	3rd
Biometrics	1	180	6	K/mP	Üs*	3rd	2nd
Differential Equations in Biology	1	180	6	mP		3rd	2nd
Mathematical Ecology	1	180	6	mP		2nd	3rd
Molecular Evolution	1	180	6	mP	Üs*	3rd	2nd
Multivariate Statistics	1	270	9	mP	Üs*	3rd	2nd
Game Theory	1	180	6	mP	Üs*	3rd	2nd
Statistics	1	270	9	mP/ HA	Üs*	2nd	3rd
Statistical Decision Theory	1	180	6	mP		2nd	3rd
Stochastic Models in Biology	1	180	6	mP	Üs*	3rd	2nd
Seminar Mathematical Modeling, Statistics and Stochastics	1	90	3	R*		2nd	
Special Lecture I Mathematical Modeling, Statistics and Stochastics	1	90	3	mP/K		2nd	
Special Lecture II Mathematical Modeling, Statistics and Stochastics	1	180	6	mP/K		2nd	

5. Professional Internship

Module	D	AB	CP	PL	SL	RPT
Professional Internship	4 weeks	180	6	PB*, TB*		3rd

(4) The qualification objectives of the individual modules are set out in the module descriptions (Annex B).

(5) A module that has already been completed during the Bachelor's program cannot be completed again in the Master's program, unless the modules are not substantially identical in content. The

determination pursuant to sentence 1 is made by the examination committee.

§ 7 Examination and Study Achievements

(1) The Master's examination consists of the examination and study achievements accompanying the program for the individual modules as well as a Master's thesis including its defense.

(2) The module examinations assess whether and to what extent the student has achieved the qualification objectives. In addition to examination achievements, study achievements pursuant to § 17b RPO must be completed in selected modules, which are prerequisites for the successful completion of the respective module.

(3) Module examinations consist of independently distinguishable examination achievements. Examination achievements are:

- a 90-minute written examination,
- a 30-minute oral examination, or
- a written assignment (processing time 3 months, length 10 to 15 pages, to be submitted in electronic form).

(4) Modules may furthermore contain study achievements that belong to the module in terms of content. Study achievements are:

- an ungraded exercise certificate. The criteria for obtaining an exercise certificate shall be determined by the instructor in the first week of lectures. If no determination is made, 50% of the exercise problems must be successfully completed,
- a 60-minute ungraded presentation with regular, active participation in the academic discourse of the seminar, or
- a 3-page written description of the internship activities (internship report) for the professional internship.

(5) If there is a choice between two types of examination achievements, it shall be made by the examiner in the first week of lectures. If the determination is not made or not made within the deadline, the form of examination listed first in § 6 shall apply.

(6) Before oral examinations, students shall be given the opportunity for a consultation.

(7) Written examinations remain with the examiner after assessment.

(8) It is within the freedom of the students to complete modules totaling more than 90 CP from subfields 1 to 4. All modules completed beyond this amount shall count as supplementary subjects and shall not be included in the overall grade.

(9) Written examination achievements are assessed by one examiner. Oral examinations are taken before one examiner in the presence of a qualified assessor. Other examination achievements are

assessed by one examiner. If it is the last attempt at resitting the examination, a second examiner must be involved for all examination achievements.

(10) By arrangement with the student, a module examination may also be conducted in German.

§ 8 Internship

(1) During the program, a self-organized four-week professional internship may be completed during the lecture-free period. For this, 6 CP are awarded.

(2) Upon application by the students, the chair of the examination committee shall decide on the suitability of the internship position in good time before the start of the professional internship. The application must be submitted in writing to the chair of the examination committee and filed with the Central Examination Office.

(3) The chair of the examination committee is available as a contact person and supervisor for the professional internship.

(4) As a study achievement, a 3-page written description of the internship activities (internship report) must be prepared and submitted together with an informal written confirmation from the supervising institution regarding the successful completion of the internship. The internship report is assessed by the chair of the examination committee as either "completed" or "not completed."

(5) Internships completed prior to the program may, upon application by the student, be recognized by the chair of the examination committee if they are directly related to the program and their completion dates back no more than one year at the time of enrollment. The application must be submitted in writing to the chair of the examination committee and filed with the Central Examination Office. Paragraph 4 shall apply accordingly.

§ 9 Master's Thesis and Defense

(1) Once the student has acquired at least 60 CP, they may apply for the assignment of a topic for the Master's thesis. The application for the assignment of the thesis topic should be submitted to the Central Examination Office no later than 14 days before the start of the processing period.

(2) The processing period for the Master's thesis comprises 840 hours (28 CP) over the course of nine months.

(3) An electronic version must be attached to the thesis. If self-written software is an essential component of the thesis, the source code must be made accessible to the reviewers via the enclosed data carrier or via DOI-citable code. In addition, at least one sample data set must be included on which the code can be tested, or a justification must be provided as to why this is not possible. At the same time, the student must declare in writing that an electronic copy of the thesis may be made

and stored in order to enable a check using plagiarism detection software.

(4) The Master's thesis must be defended. A total of 30 CP are awarded for the Master's thesis and its defense: 28 CP for the thesis, 2 CP for the defense. The defense consists of a 20-minute presentation on the essential contents of the Master's thesis and a discussion of the results and conclusions. The defense should not exceed 45 minutes. If the defense is not passed, it may be repeated once within 4 weeks. If the repeat defense is also not passed, the Master's thesis must also be repeated.

§ 10 Calculation of the Overall Grade and Academic Degree

(1) An overall grade is calculated for the Master's examination. The overall grade is calculated in accordance with § 33 RPO from the grades of all module examinations and the grade for the Master's thesis (including defense). The grades of the module examinations are weighted according to their respective relative proportion of credit points, and the grade for the Master's thesis is weighted twice.

(2) Upon passing the Master's examination, the academic degree of Master of Science (abbreviated: "M.Sc.") is awarded.

§ 11 Entry into Force, Transitional Provisions, Repeal

(1) These Examination and Study Regulations shall enter into force on October 1, 2025. They shall apply for the first time to students who enroll in the Master's degree program in Mathematics for the winter semester 2025/26.

(2) For candidates enrolled prior to this date, these regulations shall apply if the candidate has not yet completed any examination achievements or if they submit an application to this effect. The application must be submitted in writing by October 30, 2025 to the Central Examination Office and addressed to the chair of the examination committee. The application is irrevocable.

(3) For students enrolled prior to the winter semester 2025/26 who only need to complete the Master's thesis, these Examination and Study Regulations shall not apply.

(4) The Examination and Study Regulations of November 8, 2013 (publicly announced on November 18, 2023), last amended by statute of July 21, 2021 (publicly announced on July 21, 2021), shall cease to be in force upon expiration of September 30, 2027.

Executed on the basis of the resolution of the Senate of the University of Greifswald dated September 17, 2025 and the approval of the Rector dated September 24, 2025

Greifswald, September 24, 2025

The Rector of the University of Greifswald University Professor Dr. Katharina Riedel

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