



Universität Hamburg

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OFFICIAL TRANSLATION OF Fachspezifische Bestimmungen für den Studiengang „Mathematics (M.Sc.)“

(Amtliche Bekanntmachung Nr. 84 vom 13. November 2025)

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ONLY THE GERMAN VERSION SHALL BE LEGALLY VALID AND
ENFORCEABLE!**

Subject-specific provisions for the Master of Science in Mathematics (MSc)

dated September 17, 2025

On 21 October 2025, in accordance with Section 108 subsection 1 of the Hamburg higher education act (Hamburgisches Hochschulgesetz, HmbHG) dated 18 July 2001 (HmbGVBl. p. 171) as amended on 19 February 2025 (HmbGVBl. p. 241), the Executive University Board of the University of Hamburg ratified the Subject-Specific Provisions for the Master of Science in Mathematics (MSc) adopted by the Faculty Council of the Faculty of Mathematics, Informatics and Natural Sciences on 17 September 2025 on the basis of Section 91 subsection 2 number 1 HmbHG.

Preamble

These subject-specific provisions supplement the regulations of the Examination Regulations of the Faculty of Mathematics, Informatics and Natural Sciences for degree programs leading to a Master of Science (MSc) degree dated 20 October 2021 (PO MSc) as amended and describe the modules for mathematics subjects.

I. Supplementary provisions

Section 1

Study objective, examination purpose, academic degree, implementation of the study program

Section 1 subsection 1:

- 1) The Master of Science in Mathematics has a research-oriented profile.
- 2) The master's examination forms the professional qualification of an in-depth and research-related, scientific education in the mathematics degree program.
- 3) The degree program imparts the ability to tackle and solve complex problems using scientific methods, even beyond the extent of current knowledge.
- 4) Taking into account the requirements and changes in the professional world and interdisciplinary relationships, the degree program imparts the necessary technical methods, skills, and knowledge and enables students to work scientifically, to apply and critically classify scientific findings, and to act responsibly.
- 5) The Master of Science in Mathematics qualifies students to enroll in doctoral studies in the field of mathematics. The doctoral degree regulations provide further detailed information.

The degree program focuses predominantly on

- 1) specialist knowledge oriented towards current research questions on the basis of in-depth fundamental knowledge,
- 2) methodological and analytical skills that enable students to independently expand their scientific knowledge, with central importance placed on research methods,
- 3) imparting in-depth expertise and scholarly knowledge that enables analysis and the resolution of problems in mathematical research areas that have not yet been addressed,
- 4) the ability to work independently, taking a problem-oriented, interdisciplinary and responsible approach to current mathematical research problems and present the results coherently,
- 5) the teaching of key qualifications relevant to the profession.

Section 4

Program and examination structure, modules and ECTS credits

Section 4 subsections 2 and 3:

- 1) The Master of Science in Mathematics is divided into two one-year sections, the specialization phase and the research phase:
 1. the one-year specialization phase serves to acquire the advanced knowledge necessary for independent productive work in mathematics. It consists of specialization modules (= compulsory elective modules) oriented towards the core research areas of the Department of Mathematics.

Modules worth a total of 60 ECTS credits must be successfully completed. The following requirements must be met:

- a) Students may choose from all modules offered in the advanced module area of the Master of Science in Mathematics program. The corresponding modules are usually offered in English. The content covers topics from a research field of the Department of Mathematics. On completion of the respective module, students will have acquired in-depth knowledge of the current state of scientific knowledge in the research fields covered by the Department of Mathematics, and be able to apply advanced scientific methods from these fields. Students will have gained insights into specialist literature and have practiced its use. The modules all include lectures and exercises and are credited with 6 ECTS credits for 2 credit hours per week of lectures and 1 credit hour per week of practical courses for the lectures, or 12 ECTS credits for 4 credit hours per week of lectures and 2 credit hours per week of practical courses exercises for the lectures, depending on the workload. Eligibility to sit the final module examination generally requires successful completion of practical courses. Examinations are usually conducted in English, graded, and take the form of an oral or a written examination. To participate in the respective modules, prior knowledge of the material covered in the bachelor's lectures is recommended.

The mathematical specialization area also includes elective specialization modules which can be selected to round out the specialization. The corresponding modules are usually offered in English. The content covers research-oriented studies of selected topics in a research field of the Department of Mathematics. With the completion of each module, students will have acquired an in-depth understanding of selected problems, methods and results in a field of mathematics. They will have learned to master advanced techniques and developed the ability to carry out independent scientific work in the field. The modules each include lectures and exercises and are credited with 9 ECTS credits for 2 credit hours per week of lectures and 1 credit hour per week of practical courses for the lecture, 12 ECTS credits for 2 credit hours per week of lectures and 2 credit hours per week of practical courses for the lecture or 18 ECTS credits for 4 credit hours per week of lectures and 2 credit hours per week of practical courses for the lecture, depending on the workload. Eligibility to sit the final module examination generally requires successful completion of practical courses. Examinations are usually conducted in English, graded, and take the form of an oral or a written examination. Prior knowledge to the extent of the master's lectures in the specialization of the subject area is recommended for participation in the respective modules.

- b) As part of the mathematical specialization area, guided self-study courses can generally be taken in English. The content covers advanced studies in mathematics conducted under supervision. On completion of each module, students will have

familiarized themselves with a special topic in mathematics and learned the relevant specific techniques. Depending on the workload, the guided self-study is credited with 2 to 9 ECTS credits, determined before the start. There are generally no prerequisites for participation in module examinations, which are usually conducted in English, graded, and take the form of an oral examination, a presentation, or completion of a project. Advanced knowledge in the area of guided self-study as specified by the university lecturer conducting the course is recommended for participation.

- c) Modules amounting to a maximum of 18 ECTS credits can be taken from the catalog of specialization modules offered by the Department of Mathematics for the bachelor's degree program in Mathematics, provided they had not already been taken as part of the bachelor's degree program.
- d) Two seminars and/or research seminars (in any combination) from the area of presentation seminars must be completed with their own presentation. The presentation seminar is usually offered in English. The content covers selected mathematical topics from the research fields of the Department of Mathematics. On the completion of a seminar module, students will have learned to work independently on an advanced topic in mathematics, to present their results in a lecture, and to lead technical discussions. On completion of a research seminar module, students are able to participate with increasing independence in the research activities of a mathematics working group and have learned to familiarize themselves with topics of current interest in mathematics within the framework of a working group and, where possible, conduct their own work to expand the current state of knowledge presented in research literature. They are able to introduce current research results and open questions in lectures and lead scientific discussions in the working group. The lecture seminar is credited with 6 ECTS credits for a workload of 2 credit hours per week. There are generally no prerequisites for participation in module examinations, which are usually conducted in English, not graded, and take the form of a presentation. In-depth prior knowledge of the fields of mathematics as specified by the university lecturers involved in the research seminar, is recommended for participation in the respective lecture seminar.

Students are recommended to:

select at least one specialization module from the core research area in which the master's thesis is to be written.

- 2. The one-year research phase consists of three modules and is to be regarded as an inseparable unit in terms of content. The Introductory Project and the Preparatory Project modules each comprise 15 ECTS credits and are part of the third subject semester. On completion, the student will have acquired knowledge of the current state of research and the special methods in the field from which the topic of the master's thesis was chosen. The master's thesis, worth 30 ECTS credits, is written over a period of six months during the fourth subject semester. The thesis should demonstrate that the student is able to work under guidance on a selected problem in current mathematics research in accordance with scientific methods and show that they can logically and comprehensibly present and interpret the problem, means of solution, and solution itself. On commencing the research phase, the start date, research area, and supervisor must be documented.
 - A total of 42 ECTS credits from graded modules must be earned in the specialization phase.

- 2) Detailed descriptions of all required modules for mathematics are listed in II. Module descriptions.

Subject semester	Study phase	Areas of specialization/ modules	Type	ECTS CREDITS
1	Specialist advanced phase	In-depth module	Required elective	60
2		Specialization		
		Presentation seminars		
		Guided independent study		
3	Research phase	Introductory project	Required	15
		Preparatory project		15
4		Master's thesis		30

Section 4 subsection 4 Commencement of studies:

The master's degree program begins with the first day of lectures.

Section 5 Types of courses

Section 5 subsection 1:

All types of courses according to Section 5 of the Examination Regulations for Master of Science may be implemented. Typically, courses in the specialist in-depth phase use a combination of lectures and small-group work such as tutorials and presentation seminars, with projects and research-related seminars in the research phase. Another type of course is guided independent-study, in which students work on an individual task under supervision.

The course language is usually English.

Section 10 Repetition of module examinations

Section 10 subsection 1:

In justified exceptional cases, the examinations board may, at the request of a student, determine a different type of examination as a final examination attempt replace a failed module examination or partial examination.

Section 13 Completed coursework and module examinations

Section 13 subsection 4:

- (1) An academic debate, possibly in combination with a presentation, where appropriate, may be used as an additional type of examination.
- (2) The specific type, duration, and scope of the examination will be announced at the beginning of the course.
- (3) Oral examinations may be used as an alternative to written examinations for module examinations. Written examinations may be used as an alternative to oral examinations for module examinations. The responsible examinations board may approve other alternative forms of the examination.

Section 13 subsection 10:

Examinations are held in German or English. As a rule, the examination is held in the language of the course. If the examiner and the student agree, the examination may also be taken in a language other than the language of instruction.

**Section 14
Master's thesis****Section 14 subsection 1:**

A colloquium consisting of a presentation and an academic discussion about the subject matter of the thesis is a required component of the master's thesis. The colloquium is not graded.

Section 14 subsection 2 sentence 1:

Students who have acquired at least 72 ECTS credits may be admitted to the master's thesis.

Section 14 subsection 4:

The master's thesis can be written in English or German, as agreed between the student and the supervisor.

Section 14 subsection 5:

The workload for the master's thesis is 30 ECTS credits. The master's thesis must be completed within six months.

**Section 15
Assessment of the examination results****Section 15 subsection 3 sentence 5:**

If a module examination is comprised of several course examinations, then the module grade is calculated by averaging the grades from each course examination.

Section 15 subsection 3 sentence 9:

The overall grade of the master's examination is calculated on the basis of the average of the grades from the modules weighted according to the ECTS credits of the grades from the final module examinations and the master's thesis.

Section 15 subsection 3 sentence 10:

For the introductory project module and the seminars: the examination is taken without differentiated grading. The examination performance is not included in the overall grade.

Section 15 subsection 4:

The overall grade "passed with distinction" is awarded if the master's thesis has been graded 1.0 and the average grade of all module examinations is not less than 1.3.

II. Module descriptions

Module title	Introductory project
Module number/code	Ma-M-EP
Learning outcomes	Students devote themselves to the in-depth study of a modern field of research, from which the topic of the master's thesis should originate, with the aim of familiarizing themselves with the most current scientific literature. Student will have learned to independently gather the necessary information, background knowledge, and familiarization with a special topic. Students must join a research group for this module. As part of a research group, students learn teamwork and how to optimally use related informal knowledge in a close environment.
Contents	Familiarization with the specific subject area in which the master's thesis is to be written
Courses and teaching methods	Variable: Lectures, exercises, seminars, research seminars, guided self-study
Language	German or English, usually English
Prerequisites	Mandatory: none Recommended: Prior knowledge of the relevant mathematical field as specified by the university lecturer conducting the course
Module applicability	MSc Mathematics Required module MSc Mathematical Physics Required module The module forms an inseparable unit with the subsequent modules Preparatory Project and Master's Thesis and must therefore be taken in the same research field in which the master's thesis is to be written.
Module completion	Prerequisites for admission to the module examination: none Type of module examination depending on the type of course: presentation or term paper for seminars, completion of practical courses, oral or written examinations for lectures, project completion for projects (ungraded, to be determined at the beginning of the module) Examination language: usually English
Workload	Classroom study + self-study/exam preparation: 450 hrs
ECTS credits	Total: 15 ECTS credits
Module duration	1 semester
Module frequency	Each semester
Reference semester	3

Module title	Preparatory project
Module number/code	Ma-M-VP
Learning outcomes	<p>The student should</p> <ul style="list-style-type: none"> • develop special methods and knowledge of an area when solving preparatory problems, to such an extent that the student is able to successfully apply these methods to solving problems in the area of the master's thesis topic • be able to plan and structure the intended research project • learn teamwork as part of a research group, and how to optimally use related informal knowledge in a close environment.
Contents	<ul style="list-style-type: none"> • introduction to scientific work and the technical and methodological basis for the master's thesis • planning the research project to be worked on in the master's thesis
Courses and teaching methods	Variable: lectures, exercises, seminars, research seminars, guided independent study
Language	German or English, usually English
Prerequisites	<p>Mandatory: Participation introductory project</p> <p>Recommended: Prior knowledge in the relevant mathematical field as specified by the university lecturer conducting the course</p>
Module applicability	<p>MSc Mathematics Required module</p> <p>MSc Mathematical Physics Required module</p> <p>The module forms an inseparable unit with the preceding Introductory Project module and the subsequent Master's Thesis module and must therefore be taken in the same research field as the master's thesis topic.</p>
Module completion	<p>Prerequisites for admission to the module examination: none</p> <p>Type of module examination depending on the type of course: presentation or term paper for seminars, completion of practical courses, oral or written examinations for lectures, project completion for projects (graded, to be determined at the beginning of the module)</p> <p>Examination language: usually English</p>
Workload	Classroom study + self-study/exam preparation: 450 hrs
ECTS credits	Total: 15 ECTS credits
Module duration	1 semester
Module frequency	Each semester
Reference semester	3

Module title	Master's thesis
Module number/code	Ma-MSc
Learning outcomes	Candidates are able to familiarize themselves with an issue taken from current research, apply appropriate scientific methods with increasing independence, and present the results in an academically appropriate form.
Contents	<ul style="list-style-type: none"> • implementation of a research project • evaluation and processing of the results and written elaboration • oral presentation and discussion of research results <p>The master's thesis concludes the master's degree program. The results should contribute to scientific knowledge.</p>
Language	German or English, usually English
Prerequisites	Mandatory: Only students who have earned at least 72 ECTS credits in total may commence work on the master's thesis.
Module applicability	MSc Mathematics Required module
Module completion	<p>Prerequisites for admission to the module examination: none</p> <p>Examination type: master's thesis (graded, usually no more than 200 pages)</p> <p>Examination language: usually English</p>
ECTS credits	Total: 30 ECTS credits
Module duration	1 semester
Module frequency	Each semester
Reference semester	4

Section 23 Effective date

These Subject-Specific Provisions become effective on the day following official publication by the University of Hamburg.

Hamburg, 13 November 2025
University of Hamburg