

Mathematics MSc Program (starting from 2025)

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Coordinator: Prof. Molnár Lajos, molnarl@math.u-szeged.hu

The duration of the program is 4 semesters. Students have to obtain 120 credit points according to the table below.

Obligatory courses	47
Elective courses	47
Optional courses	6
Master's thesis	20
Total	120

Obligatory courses. These courses are mandatory for all students, a detailed list can be found on the next page.

Elective courses. This amount of credits must be collected from the courses listed at the end of the guide. Elective courses are divided into knowledge areas, also known as modules. During the training, the student must complete at least 3 modules out of a total of 5 modules (algebra, analysis, discrete mathematics, geometry and stochastics). A module is considered completed if the student completes at least 3 courses from that knowledge area, worth at least 10 credits.

Optional courses. This amount of credits can be collected from any courses offered by the university.

Master's thesis. Additional obligatory courses related to the thesis.

Obligatory courses

Below one can find the details of the program. The semesters for the elective and optional courses are only suggestions; students can take those courses in any semester. Contact hours are given in the format lecture + practice. In case of a 0, the respective unit does not exist. The last characters of the Neptun codes of lectures are EA and of practical courses are GA.

Course name	Course code	Number of hours	Credit	Preliminary requirement
Semester 1				
Algorithms and Their Complexity	ME4151	2 + 2	6	
Group Theory	ME4111	2 + 2	6	
Differential Equations	ME4121	2 + 2	6	
Discrete Mathematics 2	ME4152	2 + 2	6	
Probability Theory	ME4161	3 + 2	7	
Total in Semester 1			31	
Semester 2				
Functional Analysis	ME4132	2 + 2	6	
Fields and Galois Theory	ME4117	3 + 0	4	Group Theory
Elective and optional courses			20	
Total in Semester 2			30	
Semester 3				
Topology and Manifolds	ME4141	2 + 2	6	
Elective and optional courses			13	
Diploma Project	ME4191	0 + 2	10	
Total in Semester 3			29	
Semester 4				
Elective and optional courses			20	
Degree Thesis	ME4192	0 + 2	10	Diploma Project
Total in Semester 4			30	

Elective courses

Course name	Course code	Number of hours	Credit	Preliminary requirement
Algebra module				
Advanced Algorithms	ME4112	3 + 0	4	
Semigroup Theory	ME4113	3 + 0	4	
Lattice Theory	ME4114	3 + 0	4	
Model Theory	ME4115	3 + 0	4	
Ordered Sets	ME4116	3 + 0	4	
Universal Algebra	ME4118	3 + 0	4	
Analysis module				
Applied Analysis	ME4131	2 + 2	6	
Banach Algebras and Operator Theory	ME4133	3 + 0	4	
Numerical Methods for Differential Equations	ME4122	2 + 2	6	Differential Equations
Nonlinear Dynamics	ME4123	2 + 2	6	Differential Equations
Partial Differential Equations	ME4124	2 + 2	6	Differential Equations
Numerical Mathematics	ME4126	2 + 1	4	
Discrete Mathematics module				
Optimization Methods	ME4153	2 + 2	6	
Extremal Graph Theory	ME4154	3 + 0	4	
Computational Models in Combinatorics	ME4155	3 + 0	4	
Mathematical Cryptography	ME4156	3 + 0	4	
Finite Geometry	ME4157	3 + 0	4	
Geometry module				
Algebraic Topology	ME4142	3 + 0	4	
Asymptotic Geometric Analysis	ME4143	3 + 0	4	
Advanced Geometry	ME4144	3 + 0	4	
Integral Geometry	ME4145	3 + 0	4	
Combinatorics of Convex Polytopes	ME4146	3 + 0	4	
Brunn-Minkowski Theory of Convex Bodies	ME4147	3 + 0	4	
Stochastics module				
Statistical Analysis of Time Series	ME4162	2 + 2	6	Probability Theory
Mathematical Statistics	ME4163	2 + 2	6	Probability Theory
Stochastic Processes	ME4164	2 + 2	6	Probability Theory
Financial Mathematics and Ruin Theory	ME4165	2 + 2	6	Stochastic Processes

Additional elective courses that do not belong to any of the modules.

Course name	Course code	Number of hours	Credit	Preliminary requirement
Control Theory	ME4125	2 + 2	6	Differential Equations
Mathematical Data Science	ME4127	2 + 2	6	
Dynamic Modelling	ME4128	2 + 2	6	