

Mathematics (Master level)

Basic information

Code: SCI3076

Extent: 20-25 cr

Language: English

Teacher in charge: Lasse Leskelä

Administrative contact: [Johanna Bovellán](#)

Target group: All master's students with sufficient prerequisite knowledge.

Application procedure: Open for all students of Aalto University

Quotas and restrictions: No quotas.

Prerequisites: Bachelor-level minor in Mathematics or equivalent knowledge. Please check the course prerequisites before signing up.

Content and structure of the minor

This minor is designed for students willing to develop their general mathematical thinking and problem solving skills, and interested in learning mathematical and statistical methods that can be applied in science, technology, arts, and business. The student selects 20-25 credits of MS-E**** courses. Other courses can also be included with the consent of the professor in charge. A nonexhaustive list of suitable courses is given below.

General mathematics

Code	Name	ECTS	Period
MS-E1000	Crystal Flowers in Halls of Mirrors: Mathematics meets Art and Architecture	5-15	III - IV

Algebra and discrete mathematics

MS-E1050	Graph theory	5	I (2018-2019) II (2019-2020)
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MS-E1110	Number Theory	5	II (2 0 1 8 - 2 0 1 9)
MS-E1111	Galois Theory	5	I (2 0 1 9 - 2 0 2 0)
MS-E1200	Lie groups and Lie algebras	5	IV
MS-E1687	Advanced topics in cryptography	5	II
Analysis			
MS-E1280	Measure and Integral	5	III - I V
MS-E1281	Real Analysis	5	II
MS-E1461	Hilbert spaces	5	IV
MS-E1462	Banach spaces	5	I
MS-E1531	Differential Geometry	5	II
Computational mathematics			
MS-E1142	Computational algebraic geometry	5	III
MS-E1651	Numerical Matrix Computations	5	- I V
MS-E1652	Computational Methods for Differential Equations	5	I V
MS-E1653	Finite Element Method	5	I V
MS-E1654	Computational Inverse Problems	5	I V
Mechanics			
MS-E1742	Computational Mechanics 1	5	I
MS-E1743	Computational Mechanics 2	5	II
Optimization			
MS-E2121	Linear optimization	5	I- II
MS-E2122	Nonlinear optimization	5	I- II

MS-E2123	Integer optimization	5	III - I V
Statistics and probability			
MS-E1600	Probability Theory	5	III
MS-E1602	Large Random Systems	5	IV
MS-E1603	Random graphs and network statistics	5	I
MS-E2112	Multivariate Statistical Analysis	5	III - IV
MS-E2115	Experimental and statistical methods in biological sciences	5	I- II