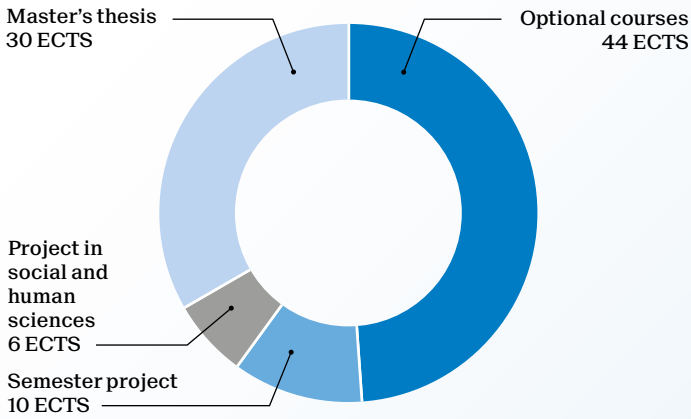


# Master of Science in MATHEMATICS

1 1/2-year program - 90 ECTS



Optional courses are classified in the following tracks (included in the 44 ECTS is the possibility to choose one course in other EPFL programs):

- Algebra and geometry
- Algorithmic and discrete mathematics
- Analysis
- Numerical analysis
- Probability and interactions / Statistics

Students may choose an additional 30 ECTS minor or opt for a Teaching specialization (additional 30 ECTS at the *Haute école pédagogique du canton de Vaud*).

School of Basic Sciences  
[go.epfl.ch/master-mathematics](http://go.epfl.ch/master-mathematics)  
 Contact: [sma@epfl.ch](mailto:sma@epfl.ch)

	Credits
<b>Optional courses</b>	<b>40</b>
<b>Algebra and geometry</b>	
Abstract analysis on groups	5
Advanced analytic number theory	5
Algebraic geometry II - Schemes and sheaves	10
Algebraic geometry III - Selected topics	5
Complex manifolds	5
Differential geometry IV - General relativity	5
Ergodic theory	5
Introduction à la géométrie riemannienne	5
Linear algebraic groups	5
Number theory - Modular forms	5
Number theory - Selected topics	5
Number theory - Cryptography	5
Representation theory of semisimple lie algebras	5
Riemann surfaces	5
Spectral theory	5
Student seminar in pure mathematics	5
Topics in arithmetic geometry	5
Topology IV.a - Algebraic K-theory	5
Topology IV.b - Homotopy theory	5
Topology V.a - Homotopical algebra	5
Topology V.b - Cohomology rings	5
<b>Algorithmic and discrete mathematics</b>	
Diophantine approximation	5
Integer optimisation	5
Mathematical modeling of behavior	5
Metric embeddings	5
<b>Analysis</b>	
Calculus of variations	5
Dispersive PDEs	5
Distribution and interpolation spaces	5
Harmonic analysis	5
Introduction to dynamical systems	5
Lattice models	5
Nonlinear Schrödinger equations	5
Optimal transport	5
<b>Numerical analysis</b>	
Computational linear algebra	5
Error control in scientific modeling	5
HPC for numerical methods and data analysis	5
Numerical integration of dynamical systems	5
Numerical integration of stochastic differential equations	5
Numerical methods for conservation laws	5
Numerics for fluids, structures and electromagnetics	5
Optimization on manifolds	5
Randomized matrix computations	5
Topics in machine learning	5
<b>Probability and interactions / Statistics</b>	
Applied biostatistics	5
Applied statistics	5
Biostatistics	5
Concentration of measures	5
Empirical processes	5
Foundations of probabilistic proofs	6
Gaussian processes	5
Introduction to stochastic PDEs	5
Multivariate statistics	5
Nonparametric estimation and inference	5
Regression methods	5
Statistical analysis of network data	5
Statistical computation and visualisation	5
Statistical inference	5
Statistical machine learning	5
Statistical mechanics and Gibbs measures	5
Statistical theory	5
Statistics for genomic data analysis	5
Stochastic epidemic models	5
Stochastic simulation	5
Theory of stochastic calculus	5
Topics in high-dimensional probability	5
Topics in stochastic analysis	6
<b>Other courses</b>	
Gödel and recursivity	5
Martingales in financial mathematics	5
Set theory	5