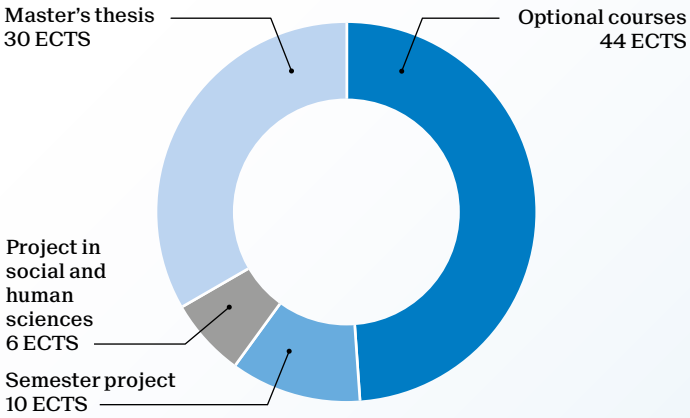
Master of Science in

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 courses in other EPFL programs):

- Algebra and geometry
- Algorithmic and discrete mathematics
- Analysis
- Numerical analysis
- Probability
- 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*).

	Credits
Optional courses	**40**
Algebra and Geometry	
Algebraic K-theory	5
Complex manifolds	5
Homotopical algebra	5
Introduction à la géométrie riemannienne	5
Introduction to algebraic geometry	5
Lie groups	5
Linear algebraic groups	5
Modern algebraic geometry	5
Modular forms and applications	5
Number theory in cryptography	5
P-adic numbers and applications	5
Representation theory of semisimple Lie algebras	5
Riemann surfaces	5
Topics in algebraic geometry	5
Topics in number theory	5
Algorithmic and discrete mathematics	
Integer optimisation	5
Mathematical modeling of behavior	5
Optimisation on manifolds	5
Analysis	
Analyse fonctionnelle II	5
Analysis on groups	5
Calculus of variations	5
Differential geometry of framed curves	5
Dispersive PDEs	5
Distribution and interpolation spaces	5
Harmonic analysis	5
Inequalities and trace theory for Sobolev spaces	10
Mathematical modeling of DNA	5
Optimal transport	5
Numerical analysis	
Computational finance	5
Computational linear algebra	5
Low-rank approximation techniques	5
Numerical integration of stochastic differential equations	5
Numerical methods for conservation laws	5
Numerics for fluids, structures and electromagnetics	5
Stochastic simulation	5
Probability	
Combinatorial statistics	5
Gaussian processes	5
Lattice models	5
Martingales in financial mathematics	5
Probabilistic methods in combinatorics	5
Probability theory	5
Statistical mechanics and Gibbs measures	5
Stochastic simulation	5
Théorie du calcul stochastique	5
Statistics	
Applied biostatistics	5
Bayesian computation	5
Biostatistics	5
Modern regression methods	5
Multivariate statistics	5
Risk, rare events and extremes	5
Robust and non-parametric statistics	5
Spatial statistics	5
Statistical analysis of network data	5
Statistical genetics	5
Statistical machine learning	5
Statistical theory	5
Statistics for genomic data analysis	5
Other courses	
Gödel and recursivity	5
Set theory	5

School of Basic Sciences
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