Master of Science in MATHEMATICS

1 1/2-year program - 90 ECTS

Optional courses 44 ECTS

Projects 16 ECTS

Master’s thesis 30 ECTS

Credits

Optional courses 44

Algebra and Geometry
Algebraic curves and cryptography 5
Differential geometry of framed curves 5
Gödel and recursivity 5
Homotopical algebra 5
Introduction à la géométrie riemannienne 5
Introduction to algebraic geometry 5
Linear algebraic groups 5
Lie groups 5
Number theory in cryptography 5
Representation theory of semisimple Lie algebras 5
Riemann surfaces 5
Set theory 5
TNT : Automorphic forms and L-functions 5

Algorithmic and Discrete Mathematics
Combinatorial Geometry 5
Combinatorial optimization 5
Convexity 5
Mathematical modelling of behavior 5
Optimal transport 5
Packing and covering 5
Probabilistic methods 5

Analysis
Analyse fonctionnelle II 5
Analysis on groups 5
Dispersive PDEs 5
Harmonic analysis 5
Parabolic and hyperbolic PDEs 5

Numerical Analysis
Computational linear algebra 5
Computational finance 5
Mathematical modelling of DNA 5
Mathematical physiology 5
Numerical approximation of PDEs II 5
Numerical integration of dynamical systems 5
Numerical integration of stochastic differential equations 5
Numerical methods for conservation laws 5
Numerical methods for saddle point problems 5

Probability
Computational finance 5
Martingales in financial mathematics 5
Probabilistic methods 5
Probability theory 5
Stochastic simulations 5
Théorie du calcul stochastique 5

Statistics
Bayesian computation 5
Biostatistics 5
Gaussian vectors and processes 5
Lattice models 5
Modern regression methods 5
Multivariate statistics 5
Risk, rare events and extremes 5
Robust and nonparametric statistics 5
Statistical machine learning 5
Statistical inference on graphs 5
Statistical mechanics and Gibbs measure 5
Statistical theory 5
Statistics for genomic data analysis 5

Projects 16

Project in Mathematics 10
Project in human and social science 6

Students may choose following tracks:

• Algebra and geometry
• Algorithmic and Discrete Mathematics
• Analysis
• Numerical Analysis
• Probability
• Statistics

It is possible to choose an additional 30 ECTS Minor.

School of Basic Sciences
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