

Studies Plan

Ingénierie Mathématiques 2023-24

Block 1

Courses		Exam Session	Exam	Credit
Language Code	Section	Teacher	Specialization	
	HSS : Introduction to project			
	SHS		Win	3
	HSS : Project			
	SHS		Sum	3

Group 1

Courses		Master 1	Master 2	Exam Session	Exam	Credit
Language Code	Section	Teacher	Specialization	Session	Session	
	Mathematics projects (master)					
F	MATH-498 MA	Profs divers	10h	10h	Sum Win	During the semester 10

Group 2

Courses		Master 1	Master 2	Exam Session	Exam	Credit
Language Code	Section	Teacher	Specialization	Session	Session	
E	MATH-519 MA		2h 2h	Sum	Oral	5
	Abstract analysis on groups					
E	MATH-416 MA	Monod	2h 2h	Win	Oral	5
	Advanced analytic number theory					
E	MATH-521 MA	Michel	2h 2h	Sum	Oral	5
	Algebraic geometry III - selected topics					
E	MATH-535 MA	Chen	2h 2h	Sum	Oral	5
	Algebraic geometry II - Schemes and sheaves					
E	MATH-510 MA	Filipazzi Mukhopadhyay	4h 4h	Win	Written	10
	Algebraic K-theory					
E	MATH-488 MA		2h 2h	Sum	Written	5
	Applied biostatistics					
E	MATH-493 MA	Goldstein	2h 2h	Sum	During the semester	5
	Applied statistics					
E	MATH-516 MA	Mhalla Ep Marchand	1h 3h	Sum	During the semester	5
	Biostatistics					
E	MATH-449 MA	Stensrud	2h 2h	Sum	Written	5
	Calculus of variations					
E	MATH-437 MA	Ruf	2h 2h	Win	Oral	5
	Complex manifolds					
E	MATH-473 MA		2h 2h	Sum	Written	5
	Computational linear algebra					
E	MATH-496 MA		2h 2h	Sum	Oral	5
	Computational linear algebra					
E	MATH-453 MA	Kressner	2h 2h	Sum	Written	5
	Differential geometry IV - General relativity					
E	MATH-530 MA	Moschidis	2h 2h	Sum	Oral	5
	Dispersive PDEs					
E	MATH-478 MA		2h 2h	Sum	Oral	5
	Distribution and interpolation spaces					
E	MATH-502 MA	Michelat	2h 2h	Win	Oral	5
	Ergodic theory					
E	MATH-518 MA	Richter	2h 2h	Win	Oral	5
	Foundations of probabilistic proofs					
E	CS-459 IN	Chiesa	4h 1h	Win	During the semester	6
	Gaussian processes					
E	MATH-426 MA		2h 2h	Sum	Oral	5

E	Gödel and recursivity MATH-483	MA		2h 2h		Win	Written	5
E	Harmonic analysis MATH-405	MA	Krieger	2h 2h		Sum	Oral	5
E	Homotopical algebra MATH-436	MA	Hess Bellwald	2h 2h		Sum	Oral	5
E	Homotopy theory MATH-497	MA		2h 2h		Win	Written	5
E	HPC for numerical methods and data analysis MATH-505	MA	Grigori	2h 2h		Win	During the semester	5
E	Integer optimisation MATH-504	MA	Eisenbrand	2h 2h		Sum	Written	5
F	Introduction to riemannian geometry MATH-422	MA		2h 2h		Sum	Oral	5
E	Lattice models MATH-434	MA		2h 2h		Win	Written	5
E	Lie groups MATH-429	MA	Michel	2h 2h		Sum	Oral	5
E	Linear algebraic groups MATH-479	MA		2h 2h		Sum	Oral	5
E	Low-rank approximation techniques MATH-403	MA		2h 2h		Win	Oral	5
E	Martingales in financial mathematics MATH-470	MA	Schmutz	2h 2h		Sum	Oral	5
E	Mathematical modelling of behavior MATH-463	MA	Bierlaire	2h 2h		Win	Written	5
E	Metric embeddings MATH-513	MA		2h 2h		Win	Written	5
E	Multivariate statistics MATH-444	MA	Panaretos	2h 2h		Sum	Written	5
E	Nonlinear Schrödinger equations MATH-514	MA	Genoud	2h 2h		Win	Oral	5
E	Number theory II.a - Modular forms MATH-511	MA	Viazovska	2h 2h		Sum	Oral	5
E	Number theory II.b - selected topics MATH-417	MA		2h 2h		Sum	Oral	5
E	Numerical integration of stochastic differential equations MATH-450	MA	Blumenthal	2h 2h		Sum	Written	5
E	Numerical methods for conservation laws MATH-459	MA	Licht	2h 2h		Win	Oral	5
E	Numerics for fluids, structures & electromagnetics MATH-468	MA		2h 2h		Win	Oral	5
E	Optimal transport MATH-476	MA		2h 2h		Sum	Oral	5
E	Optimization on manifolds MATH-512	MA		2h 2h		Sum	During the semester	5
E	Regression methods MATH-408	MA	Davison	2h 2h		Win	Written	5
E	Representation theory of semisimple lie algebras MATH-492	MA		2h 2h		Sum	Written	5
E	Riemann surfaces MATH-410	MA	Mornev	2h 2h		Win	Written	5
E	Risk, rare events and extremes MATH-447	MA		2h 2h		Sum	Written	5
E	Set theory MATH-318	MA	Duparc	2h 2h		Sum	Written	5
E	Spectral theory MATH-561	MA		2h 2h		Win	Oral	5
E	Statistical analysis of network data MATH-448	MA	Olhede	2h 2h		Win	Written	5
E	Statistical computation and visualisation MATH-517	MA	Mhalla Ep Marchand	2h 2h		Win	During the semester	5
E	Statistical genetics MATH-438	MA	Goldstein	2h 2h		Sum	During the semester	5

E	Statistical inference								
	MATH-562	MA	Davison	2h	2h		Win	Written	5
E	Statistical machine learning								
	MATH-412	MA	Obozinski	2h	2h		Win	Written	5
E	Statistical mechanics and Gibbs measures								
	MATH-486	MA	Friedli		2h 2h		Sum	Oral	5
E	Statistical theory								
	MATH-442	MA		2h	2h		Win	Written	5
E	Statistics for genomic data analysis								
	MATH-474	MA			2h 2h		Sum	During the semester	5
E	Stochastic epidemic models								
	MATH-560	MA	Ged	2h	2h		Win	Written	5
E	Stochastic simulation								
	MATH-414	MA	Nobile	2h	2h		Win	Oral	5
E	Student seminar in pure mathematics								
	MATH-563	MA	Wyss	2h	2h		Win	During the semester	5
E	Theory of stochastic calculus								
	MATH-431	MA	Dalang		2h 2h		Sum	Written	5
E	Topics in arithmetic geometry								
	MATH-494	MA			2h 2h		Sum	Oral	5
E	Topics in calculus of variations								
	MATH-515	MA			2h 2h		Win	Oral	5
E	Topics in machine learning								
	MATH-520	MA	Chizat	2h	2h		Win	During the semester	5
E	Topology IV.b - Cohomology rings								
	MATH-506	MA	Scherer	2h	2h		Win	Written	5

Internship

Courses			Master 1	Master 2	Exam Session	Exam	Credit
Language	Code	Section	Teacher	Specialization	on p	l e p	
	Engineering internship (master in Applied Mathematics)						
F	MATH-596	MA	Profs divers		680h	680h	Sum Win During the semester

Master project

Courses			Master 1	Master 2	MP Spring	MP Autumn	Exam Session	Exam	Credit
Language	Code	Section	Teacher	Specialization	on p	l e p	l e p	l e p	
	Engineering internship credited with master project (master in Mathematical Sciences)								
F	MATH-597	MA	Profs divers		320h	320h	320h	320h	Sum Win Term paper 0
	Master project in Mathematics								
	MATH-599	MA	Profs divers			900h	900h	Sum Win Oral	30