

Studies Plan

Science et ingénierie computationnelles 2025-26

Block 1

Courses				Master 1					Master 2					Exam Session	Exam	Credit		
Lang.	Code	Sect.	Teacher	Specialization	En	L	T	P	I	C	E	L	T	P	I			
	Advanced numerical analysis II																	
E	MATH-351	MA	Picasso		2h	2h										Win	Written	5
E	Algorithms I									4h	2h					Sum	Written	8
	CS-250	IN	Chiesa Svensson															
	Computer simulation of physical systems I																	
E	PHYS-403	PH	Pasquarello		2h	2h										Win	Oral	4
	Image processing I																	
E	MICRO-511	MT	Unser Van De Ville		2h	1h										Win	Written	3
	Machine learning																	
E	CS-433	IN	West		4h	2h		2h								Win	Written	8
	Molecular dynamics and Monte-Carlo simulation																	
E	CH-351	CGC	Röthlisberger							1h	1h					Sum	During the semester	2
	Numerical analysis and computational mathematics																	
E	MATH-456	MA	Grigori		2h	2h										Win	Written	4
	Parallel and high-performance computing																	
E	MATH-454	MA	Antolin Sanchez							2h	1h		1h			Sum	Oral	4
	Parallelism and concurrency in software																	
E	CS-302	IN	Falsafi							4h	2h					Sum	During the semester	6
	Programming concepts in scientific computing																	
E	MATH-458	MA	Anciaux		2h	2h										Win	During the semester	4

Block SHS Master

Courses				Exam Session	Exam	Credit
Lang.	Code	Sect.	TeacherSpecialization			
HSS : Introduction to project						
		SHS		Win		3
HSS : Project						
		SHS		Sum		3

Group 1

Courses			Master 1					Master 2					MP Autumn					MP Spring					Exam Session	Exam	Credit				
Lang.	Code	Sect.	Teacher	Specialization	En	L	T	P	I	C	E	L	T	P	I	C	E	L	T	P	I	C	E	L	T	P	I		
	CSE project I																												
	MATH-591	MA	Profs divers							8h					8h											Sum Win	During the semester	8	
	CSE project II																												
	MATH-592	MA	Profs divers							8h					8h											Sum Win	During the semester	8	
	Engineering internship (master in computational sciences and engineering)																												
	MATH-595	MA	Profs divers							320h					320h						320h					320h	Sum Win	During the semester	8

Group 2

Courses				Master 1					Master 2					Exam Session	Exam	Credit	
Lang.	Code	Sect.	Teacher	Specialization	C	E	L	T	P	I	C	E	L	T	P	I	
	Advanced multiprocessor architecture																
E	CS-471	IN	Falsafi		4h			8h							Win	During the semester	8
	Algorithms II																
E	CS-450	IN	Kapralov		4h	3h									Win	Written	8
	Applied data analysis																
E	CS-401	SC	Brbic		2h			2h							Win	Written	8
	Atomistic and quantum simulations of materials																
E	MSE-468	MX	Pizzi								3h		1h		Sum	During the semester	4
	Computational linear algebra																
E	MATH-453	MA	Kressner								2h	2h			Sum	Written	5
	Computational methods in molecular quantum mechanics																
E	CH-452	CGC	Bonella		2h	1h									Win	Oral	4
	Computational neurosciences: neuronal dynamics																
E	NX-465	NX	Gerstner								2h	2h			Sum	Written	5
	Deep learning																
E	EE-559	EL	Cavallaro								2h	2h			Sum	During the semester	4
	Deep learning in biomedicine																
E	CS-502	IN									2h	2h	1h		Sum	During the semester	6
	Deep reinforcement learning																
E	CS-456	IN									2h	1h	1h		Sum	Written	6
	Distributed intelligent systems																
E	ENG-466	SIE	Martinoli		2h	2h	1h								Win	Oral	5
	Dynamical system theory for engineers																
E	COM-502	SC									3h	1h			Sum	Written	6
	Environmental transport phenomena																
E	ENG-420	SIE	Crouzy Porté-Agel		2h	1h		2h							Win	Written	5
	Error control in scientific modelling																
E	MATH-500	MA	Herbst		2h	2h									Win	Oral	5
	Foundations of Data Science																
E	COM-406	IN	Gastpar		4h	2h									Win	Written	8
	Geometric computing																
E	CS-457	IN			3h	1h	1h								Win	Written	8
	HPC for numerical methods and data analysis																
E	MATH-505	MA			2h	2h									Win	Oral	5
	Hydrodynamics																
E	ME-444	GM	Gallaire								2h	2h			Sum	Written	5
	Image processing II																
E	MICRO-512	MT	Sage Unser Van De Ville								2h	1h			Sum	Written	3
	Information security and privacy																
E	COM-402	IN	Payer		3h	1h		2h							Win	Written	8
	Instability																
E	ME-466	GM	Gallaire		2h	1h									Win	Written	3
	Introduction to electronic structure methods																
E	CH-353	CGC	Röthlisberger		2h	2h									Win	During the semester	4
	Kinetic and non-equilibrium conservation laws																
E	MATH-532	MA	Gorji								2h	2h			Sum	Oral	5
	Mathematical modelling of behavior																
E	MATH-463	MA	Bierlaire		2h	2h									Win	Written	5

E	Mathematics of data: from theory to computation			3h	3h	Win	Written	6
	EE-556	EL	Cevher					
E	Molecular quantum dynamics				2h 1h	Sum	Oral	3
	CH-453	CGC	Vanicek					
E	Numerical approximation of PDEs				2h 2h	Sum	Written	5
	MATH-451	MA	Antolin Sanchez Buffa					
E	Numerical flow simulation			2h 2h		Win	During the semester	5
	ME-474	GM	Boujo					
E	Numerical integration of dynamical systems				2h 2h	Sum	Written	5
	MATH-452	MA	Blumenthal					
E	Numerical integration of stochastic differential equations				2h 2h	Sum	Written	5
	MATH-450	MA	Nobile					
E	Numerics for fluids, structures & electromagnetics			2h 2h		Win	Oral	5
	MATH-468	MA						
E	Optimization for machine learning				2h 2h 1h	Sum	Written	8
	CS-439	IN	Flammarion Jaggi					
E	Principles and applications of systems biology			2h 1h		Win	During the semester	3
	ChE-411	CGC	Hatzimanikatis					
E	Randomized matrix computations			2h 2h		Win	Oral	5
	MATH-403	MA						
E	Stochastic simulation			2h 2h		Win	Written	5
	MATH-414	MA	Nobile					
E	Structural biology				2h 2h	Sum	During the semester	4
	BIO-315	SV	Antanasijevic Dal Peraro					
E	Systems for data management and data science				2h 2h 2h	Sum	Written	8
	CS-460	IN	Ailamaki Kermarrec					
E	Turbulence				3h 2h	Sum	During the semester	5
	ME-467	GM	Schneider					
E	Understanding advanced molecular simulation			2h	1h	Sum	During the semester	4
	CH-420	CGC	Smit					

Master project

Courses				MP Autumn					MP Spring					Exam Session	Exam	Credit		
Lang.	Code	Sect.	Teacher	Specialization	En	L	T	P	I	C	E	L	T	P	I			
	Projet de master en science et ingénierie computationnelles																	
	MATH-598	MA	Profs divers							900h					900h	Sum Win	Oral	30