

The French text of this document (see next page) shall be deemed the authentic version, the English translation being intended for information purposes only.

2019-2020 **FINANCIAL ENGINEERING**

Master program

Code	Courses	Lecturers (subject to change)	Programs	Semesters									Credits	Exam period *	Form of exam *
				MA1			MA2			MA3					
				c	e	p	c	e	p	c	e	p			
Block 1 : Foundation courses													30		
FIN-411	Accounting for finance ****	Cauvin	IF	2									2	W	written
FIN-403	Econometrics	Semadeni	IF	2	2								4	W	written
FIN-401	Introduction to finance (only for IF students)	Fahlenbrach	IF	3	2								6	W	written
FIN-406	Macrofinance****	Lambertini	IF	2	1.5								4	W	written
FIN-414	Optimization methods****	Perazzi	IF	1	1								2	A sem	
FIN-415	Stochastic calculus	Filipovic	IF	3	2								6	W	written
HUM-nnn	SHS : introduction au projet	Divers	CDH	2		1							3	A sem	
HUM-nnn	SHS : projet	Divers	CDH						3				3	S sem	no withdrawal
Block 2 : Advanced courses													32		
FIN-503	Advanced derivatives	Perazzi	IF							2	1		4	A sem	
FIN-404	Derivatives	Hugonnier	IF				3	2					6	S	written
FIN-407	Financial econometrics	vacat	IF				3	2					6	S	written
FIN-416	Interest rate and credit risk models	Filipovic	IF							3	2		6	W	written
FIN-405	Investments	Collin-Dufresne	IF				3	2					6	S sem	
FIN-417	Quantitative risk management	Malamud	IF							2	2		4	W	written
Group : Electives courses													28		
MICRO-570	Advanced machine learning	Billard	MT				2	1	1				4	S	oral
MATH-351	Advanced numerical analysis	Picasso	MA	2	2								5	W	written
CS-401	Applied data analysis	West	IN	2		2							6	W	written
MICRO-455	Applied machine learning	Billard	MT	4									4	A sem	no withdrawal
FIN-472	Computational finance	Glau/Pulido/Statti	IF							2	2		5	W	written
COM-401	Cryptography and security	Vaudenay	SC	4	2								7	W	written
MGT-432	Data science for business	Younge	MTE							3		1	6	A sem	no withdrawal
MGT-415	Data science in practice****	Bruffaerts	MTE				1.5	0.5					3	S	written
FIN-413	Financial applications of blockchains and distributed ledgers****	Xu	IF	1.5									2	A sem	no withdrawal
FIN-525	Financial big data	Challet	IF							3			3	A sem	no withdrawal
FIN-523	Global business environment	Lambertini	IF	2	1								4	A sem	
COM-402	Information security and privacy	Hubaux/Oechslin/Troncoso	IN/SC	3	1	2							6	W	written
MGT-431	Information: strategy & economics (pas donné en 2019-20)	Weber Th.	MTE				3						4	S sem	no withdrawal
CS-430	Intelligent agents	Faltings B.	IN	3	3								6	A sem	
EE-351	Introduction to machine learning	Fleuret	EL				4						4	S	written
CS-433	Machine learning	Jaggi/Urbanke	IN/SC							4	2		7	W	written
FIN-418	Machine learning for finance	Ackerer	IF							2			2	W	written
MICRO-401	Machine learning programming	Billard	MT			2							2	A sem	
MATH-463	Mathematical modelling of behavior	Bierlaire	GC	2	2								5	W	written
MATH-408	Modern regression methods***	Davison	MA				2	2					5	S	written
MGT-416	Network analytics	vacat	MTE				2	1					3	S sem	
MATH-456	Numerical analysis and computational mathematics	Vazquez Hernandez	MA	2	2								4	W	written
MATH-451	Numerical approximation of PDEs	Pagliantini	MA				2	2					5	S	written
MATH-450	Numerical integration of stochastic differential equations	Abdulle	MA				2	2					5	S	written
MGT-454	Principles of microeconomics	Mack	MTE	3	1								4	W	written
FIN-410	Real options and financial structuring	Arnold	IF							2	1		4	A sem	
MATH-447	Risk, rare events and extremes ***	Davison	MA							2	2		5	W	written
MATH-412	Statistical machine learning	Dehaene/Obozinski	MA	2	2								5	W	written
MATH-342	Time series	Ohlede	MA				2	2					5	S	written
FIN-522	Venture capital	Fahlenbrach	IF							3			4	A sem	
Total number of credits of the master cycle :													90		

Notes:

- * Please refer to Exams Rulebook (article 3, paragraph 4)
- ** 3 hours of course taught over 7 weeks
- *** courses alternating every 2 years
- **** special schedule
- no withdrawal = impossible to withdraw after the end of the registration deadline

Engineering internship:

See the details in the implementing regulations

All the courses of the M1 and M2 semesters have been established as prerequisites for the courses of the M3 semester
 Courses of the M3 semester cannot be taken in the M1 semester

KEY:	
Codes:	4nn: regular master courses 5nn: advanced master courses
Column l/e/p:	number of contact hours per week of lectures (l) exercises (e), practical work (p)
Semesters:	MA1: 1st semester (Autumn) MA2: 2nd semester (Spring) MA3: 3rd semester (Autumn)
Exam period:	W and S: exam carried out during the Winter (W) or Summer (S) exam period A sem and S sem: exam carried out during the Autumn (A sem) or Spring semester (S sem)

Code	Matières	Enseignants : sous réserve de modification	Sections	Semestres									Crédits	Période des épreuves *	Type examen *
				MA1			MA2			MA3					
				c	e	p	c	e	p	c	e	p			
	Bloc 1 : Cours fondamentaux												30		
FIN-411	Accounting for finance ****	Cauvin	IF	2									2	H	écrit
FIN-403	Econometrics	Semadeni	IF	2	2								4	H	écrit
FIN-401	Introduction to finance (only for IF students)	Fahlenbrach	IF	3	2								6	H	écrit
FIN-406	Macrofinance****	Lambertini	IF	2	1.5								4	H	écrit
FIN-414	Optimization methods****	Perazzi	IF	1	1								2	sem A	
FIN-415	Stochastic calculus	Filipovic	IF	3	2								6	H	écrit
HUM-nnn	SHS : introduction au projet	Divers	CDH	2		1							3	sem A	
HUM-nnn	SHS : projet	Divers	CDH						3				3	sem P	sans retrait
	Bloc 2 : Cours avancés												32		
FIN-503	Advanced derivatives	Perazzi	IF							2	1		4	sem A	
FIN-404	Derivatives	Hugonnier	IF				3	2					6	E	écrit
FIN-407	Financial econometrics	vacat	IF				3	2					6	E	écrit
FIN-416	Interest rate and credit risk models	Filipovic	IF							3	2		6	H	écrit
FIN-405	Investments	Collin-Dufresne	IF				3	2					6	sem P	
FIN-417	Quantitative risk management	Malamud	IF							2	2		4	H	écrit
	Groupe : Branches à option												28		
MICRO-570	Advanced machine learning	Billard	MT				2	1	1				4	E	oral
MATH-351	Advanced numerical analysis	Picasso	MA	2	2								5	H	écrit
CS-401	Applied data analysis	West	IN	2		2							6	H	écrit
MICRO-455	Applied machine learning	Billard	MT	4									4	sem A	sans retrait
FIN-472	Computational finance	Glau/Pulido/Statti	IF							2	2		5	H	écrit
COM-401	Cryptography and security	Vaudenay	SC	4	2								7	H	écrit
MGT-432	Data science for business	Younge	MTE							3	1		6	sem A	sans retrait
MGT-415	Data science in practice****	Bruffaerts	MTE				1.5	0.5					3	E	écrit
FIN-413	Financial applications of blockchains and distributed ledgers****	Xu	IF	1.5									2	sem A	sans retrait
FIN-525	Financial big data	Challet	IF							3			3	sem A	sans retrait
FIN-523	Global business environment	Lambertini	IF	2	1								4	sem A	
COM-402	Information security and privacy	Hubaux/Oechsli/Troncoso	IN/SC	3	1	2							6	H	écrit
MGT-431	Information: strategy & economics (pas donné en 2019-20)	Weber Th.	MTE				3						4	sem P	sans retrait
CS-430	Intelligent agents	Faltings B.	IN	3	3								6	sem A	
EE-311	Fundamentals of machine learning	Fleuret	EL				4						4	E	écrit
CS-433	Machine learning	Jaggi/Urbanke	IN/SC							4	2		7	H	écrit
FIN-418	Machine learning for finance	Ackerer	IF							2			2	H	écrit
MICRO-401	Machine learning programming	Billard	MT			2							2	sem A	
MATH-463	Mathematical modelling of behavior	Bierlaire	GC	2	2								5	H	écrit
MATH-408	Modern regression methods***	Davison	MA				2	2					5	E	écrit
MGT-416	Network analytics	vacat	MTE				2	1					3	sem P	
MATH-456	Numerical analysis and computational mathematics	Vazquez Hernandez	MA	2	2								4	H	écrit
MATH-451	Numerical approximation of PDEs	Pagliantini	MA				2	2					5	E	écrit
MATH-450	Numerical integration of stochastic differential equations	Abdulle	MA				2	2					5	E	écrit
MGT-454	Principles of microeconomics	Mack	MTE	3	1								4	H	écrit
FIN-410	Real options and financial structuring	Arnold	IF							2	1		4	sem A	
MATH-447	Risk, rare events and extremes ***	Davison	MA							2	2		5	H	écrit
MATH-412	Statistical machine learning	Dehaene/Obozinski	MA	2	2								5	H	écrit
MATH-342	Time series	Ohlede	MA				2	2					5	E	écrit
FIN-522	Venture capital	Fahlenbrach	IF							3			4	sem A	
	Total des crédits du cycle master :												90		

Remarques :

- * Se référer à l'art. 3 al. 4 du règlement d'application
- ** enseigné à raison de 3h de cours sur 7 semaines
- *** cours donnés en alternance tous les 2 ans
- ****horaire spécial
- sans retrait = pas de retrait possible après le délai d'inscription

Stage d'ingénieur :

Voir les modalités dans le règlement d'application

**Tous les cours des semestres MA1 et MA2 sont des prérequis pour les cours du semestre MA3.
Les cours mentionnés au semestre MA3 ne peuvent être pris au semestre MA1.**