UPEC
UNIVERSITÉ PARIS-EST CRÉTEIL

FACULTÉ DES SCIENCES
ET TECHNOLOGIE

Master's degree in Mathematics
Probabilities and new data statistics

Master's degree year 1 - semester 1

Functional analysis 1 (6 ECTS)
Probalities and applications (6 ECTS)
Modelling and partial derivative equation (6 ECTS)
Digital tools (3 ECTS)
Option (6 ECTS), choose between:
* Algebra and applications (6 ECTS)
* Differential geometry (6 ECTS)
* Free-choice class (6 ECTS)
English (3 ECTS)

Master's degree year 1 - semester 2

Complex and Fourier analyses (6 ECTS)
Study and research (3 ECTS)
Professional culture (3 ECTS)
Options (18 ECTS), choose between:
* Functional analysis 2 (6 ECTS)
* Partial derivative equation in biology and physics (6 ECTS)
* Process and finance (6 ECTS)
* Wavelet and signal processing (6 ECTS)
* Statistics (6 ECTS)

Master's degree year 2 - semester 1

Stochastic calculus (9 ECTS)
Nonparametric statistic (9 ECTS)
Option (12 ECTS), choose between:
* Degenerate parabolic equations and Hamilton–Jacobi equations (6 ECTS)
* Discrete curves and 3D image synthesis (6 ECTS)
* Big data and finance (6 ECTS)
* Risk measures in finance (6 ECTS)
* Great deviations (6 ECTS)
* Convergence to equilibrium of reversible diffusions (6 ECTS)

Master's degree year 2 - semester 2

Internship (18 ECTS)
Option (12 ECTS), choose between:
* Fourier analysis methods for non-homogeneous fluid study (6 ECTS)
* Multifractal analysis and signal and image processing (6 ECTS)
* Non-linear dispersive partial differential equations: introduction (6 ECTS)
* Optimal transport and applications (6 ECTS)
* Elliptic partial differential equations from geometry (0 ECTS)
* Interest rate models (6 ECTS)
* Malliavin calculus (6 ECTS)

* Jump process and application to the energy market (6 ECTS)
* Risk measures in finance (6 ECTS)
* Financial markets microstructure (6 ECTS)
* Counterparty and credit risks (6 ECTS)
* Numerical methods in actuarial finance (6 ECTS)
* Statistical forecasting (6 ECTS)
* Models selection (6 ECTS)
* Simulation and copula (6 ECTS)
* Limit theorems for processes (6 ECTS)