

Stochastic calculus

**ECTS** : 6

**Volume horaire** : 48

**Description du contenu de l'enseignement :**

The first part of the course presents stochastic calculus for continuous semi-martingales. The second part of the course is devoted to Brownian stochastic differential equations and their links with partial differential equations. This course is naturally followed by the course "Jump processes".

- Probability basics
- Stochastic processes
- Brownian motion, Continuous semi-martingales, Stochastic integral, Itô's formula for semi-martingales and Girsanov's theorem Stochastic differential equations
- Diffusion processes Feynman-Kac formula and link with the heat equation Probabilistic representation of the Dirichlet problem

**Document susceptible de mise à jour - 02/04/2026**

**Université Paris Dauphine - PSL** - Place du Maréchal de Lattre de Tassigny - 75775 PARIS Cedex 16