Calcul stochastique

Lecturer
Griselda DEELSTRA (Coordinator)

Course mnemonic
STAT-F415

ECTS credits
5 credits

Language(s) of instruction
French

Course period
Second term

Campus
Plaine

Course content

The content of this course is the introduction of concepts related to Brownian motion, stochastic integration, stochastic differential equations and a link with PDE's and the change of probability measures. In particular, we will derive Ito's lemma, the theorem of Girsanov and the lemma of Feynman-Kac. Several applications in stochastic finance will be discussed.

Objectives (and/or specific learning outcomes)

The purpose of this course is to provide the necessary background for enabling the student to understand and employ the basic concepts of the theory.

Teaching method and learning activities

Theoretical lectures.

There will be some small exercises and examples.

Contribution to the teaching profile

See the French version for more details.

In general, stochastic calculus is a subfield of mathematics at the interplay of probability theory, stochastic processes and real analysis. The core theme is to define and analyze the properties of a "stochastic integral", that means an integral in which the integrand and the integrator are allowed to be stochastic processes. Stochastic finance is one of the most prominent areas of application, where it plays a fundamental role for the pricing and hedging of financial derivatives.

References, bibliography and recommended reading

Steele J. Michael, 2001, " Stochastic Calculus and Financial Applications ", Springer-Verlag, Applications of Mathematics.

Course notes

Université virtuelle

Other information

Place(s) of teaching

Plaine

Contact(s)

Griselda Deelstra (Campus de la Plaine, room 0.9.110)

Evaluation method(s)

Oral examination

Evaluation method(s) (additional information)

The assessment method could be adapted according to the sanitary situation.

Determination of the mark (including the weighting of partial marks)

The mark is completely based on the exam.

Main language(s) of evaluation

French

Programmes

Programmes proposing this course at the faculty of Sciences

MA-MATH | Master in Mathematics | finalité Research/unit 1 and finalité Research/unit 2 and MA-STAT | Master in Statistics : General | finalité Research General/unit 2