2SC7110 – Stochastic Finance and risk modelling

Instructors: Gaoyue Guo
Department: DÉPARTEMENT MATHÉMATIQUES
Language of instruction: ANGLAIS
Campus: CAMPUS DE PARIS - SACLAY
Workload (HEE): 60
On-site hours (HPE): 34,50

Description
This course is an introduction to financial mathematics in discrete time, with a focus on derivatives pricing/hedging and risk measures in a discrete-time stochastic framework.

Quarter number
ST7

Prerequisites (in terms of CS courses)
1st year Mathematics and Computer Science courses (CIP, EDP, Algo et complexité, Statistiques)

Syllabus
Stochastic calculus in discrete time. Introduction to financial derivatives. Financial market modelling in discrete time. Towards continuous time and the Black-Scholes model. Risk measures. Porfolio optimization.

Class components (lecture, labs, etc.)
Lectures (18h), tutorials (9h) and labs (6h)

Grading
Homework (50%) and final exam (50%).

Course support, bibliography
Lecture notes of CIP;
Föllmer, H., & Schied, A. (2011). *Stochastic finance: an introduction in discrete time*. Walter de Gruyter.

Learning outcomes covered on the course
The subject aims to introduce the fundamental concepts of financial risk management to students, and in particular the corresponding mathematical aspects. This module will allow the students to be familiar with stochastic models of asset pricing, to discover common derivative products and to address real issues of risk management.