

Syllabus information.

This course develops some of the techniques of stochastic calculus and applies them to the financial asset modeling theory.

Prerequisite: ACM 95/100 or instructor's permission. A basic knowledge of probability and statistics as well as transform methods for solving PDEs is assumed.

Weekly homework forms an integral role in this course and some material will only be introduced in the context of assignments.

The mathematical concepts/tools developed will include introductions to random walks, Brownian motion, quadratic variation and Ito-calculus. Connections to PDEs will be made by Feynman-Kac Theorems. Concepts of risk-neutral pricing and martingale representation are introduced in the pricing of options. Topics covered will be selected from standard options, exotic options, American derivative securities, term-structure models, and jump processes.