MATH 7380-1: Stochastics & Finance

Time: MWF 8:40–9:30

Room: Lockett 113

Prerequisite

Math 4031 Advanced Calculus
Math 4055 Introduction to Probability

Textbook

No textbook is required. The lectures will be based on my book manuscript.

Coverage

This course consists of two parts
(1) The mathematics of stochastic integration:
    We will study several topics such as Brownian motion, stochastic integrals, martingales, Ito's lemma, Markov and diffusion processes, and stochastic differential equations. The emphasis will be in the motivations and the study of important properties without going through too much technical details.
(2) Some applications to mathematical finance:
    We will cover topics from continuous-time finance theory such as trading strategies, arbitrage pricing, valuation of derivative securities, the Black-Scholes analysis, hedging portfolio, and option pricing.

Reference

1. Kuo, H.-H.: Stochastic Integration. (In preparation)
2. Øksendal, B.: Stochastic Differential Equations. Fifth edition, Springer, 2000

Grading

The grade will be determined by homework assignments (70%) and the final exam (30%) with the tentative scale: A 80%; B 70%; C 60%

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