

Mathematics of Finance

V63.0250

Professor: Scott Sheffield, 1107 WWH, 8-3262, sheff@cims.nyu.edu.
Office hours: Mondays and Wednesdays 4-5.

Time: Mondays and Wednesdays, 2-3:50, Waverly Building, 570. First class: Sept. 7. Midterm: October 12.

Goal: This class introduces students to central concepts in financial engineering, including stochastic models of asset prices, portfolio optimization, and Black-Scholes arbitrage pricing. In the process, it introduces the students to the relevant mathematical techniques, such as basic probability, convex optimization, martingales, and Brownian motion.

Course requirements: Homework assignments; midterm exam; final exam.

Textbook: Marek Capiński and Tomasz Zastawniak *Mathematics for Finance: An Introduction to Financial Engineering*

Course reserve: Sheldon M. Ross, *An Elementary Introduction to Mathematical Finance*; Mark P. Kritzman, *Puzzles of Finance: Six Practical Problems and their Remarkable Solutions*; Joseph Stampfli and Victor Goodman *The Mathematics of Finance: Modeling and Hedging*; John C. Hull *Options, Futures, and Other Derivatives*.

The first few lectures of the course are an overview of basic probability (mean, variance, covariance, independence, conditional probability, normal random variables, central limit theorem, Brownian motion, geometric Brownian motion), as contained in Chapters 1 through 3 of Ross. (Similar material can be found in most basic texts on probability.) The principle source for the remainder of the course is Chapters 1 through 8 of Capiński and Zastawniak.