Mathematics of Finance
V63.0250 – Fall, 2004

Professor: Robert Kohn, 612 WWH, 8-3217, kohn@cims.nyu.edu. Office hours: Mondays and Wednesdays 5-6.


Goal: This class introduces students to some central ideas of quantitative finance, including portfolio optimization, stochastic models of asset prices, and arbitrage pricing of derivative securities. In the process, it also introduces students to relevant mathematical techniques such as linear and quadratic programming, convex optimization, basic probability, and Brownian motion.

Prerequisites: Calculus I-II and Linear Algebra are required. Calculus III is also required but may be taken simultaneously. Some prior exposure to probability or statistics will be helpful. Students with substantial knowledge of economics and finance may find this course too basic; such students may wish to take the graduate math class Derivative Securities instead.

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

Textbook: David Luenberger, Investment Science, Oxford University Press, 1998. This book is far from perfect, but it’s the only text I know at the appropriate level with good breadth.

Also recommended: M. Kritzman, Puzzles of Finance: Six Practical Problems and their Remarkable Solutions, John Wiley & Sons, 2000; and Sheldon Ross, An Elementary Introduction to Mathematical Finance: Options and Other Topics, second edition, Cambridge University Press, 2003. Kritzman is a charming, inexpensive paperback; it’s a bit less mathematical than this class but covers similar material. I’ll base a few lectures on it. Ross is too uneven to use as a textbook, but the first few chapters give a good exposure to discrete probability; students without prior exposure to probability may find it especially useful.

All three books (Luenberger, Ross, Kritzman) are on reserve in the CIMS library. My advice: buy Luenberger (we’ll use it a lot). Consider buying Kritzman (it’s a lovely little book, not expensive either). Read Ross in the library or xerox the first few chapters and read them at home.