Math 294

Mathematics of Finance

Spring 2024

This course is an introduction to the mathematics of financial models, especially hedging and arbitrage pricing. The course begins with the development of the basic ideas of hedging and arbitrage pricing in the discrete time setting of binomial tree models. Relevant notions (conditional expectation, martingale, change of measure, martingale representation) will be introduced in this discrete setting. Continuous time models will then be covered, based on the Brownian motion process and Itô's stochastic calculus. These tools will be applied to option pricing and the Black-Scholes formula. Additional topics will be discussed, as time allows.

- We shall be using the text *Introduction to the Mathematics of Finance* by Professor R.J. Williams. I plan to discuss most of the material contained in chapters 1–5 of the text.
- Lectures will be on Monday, Wednesday, and Friday, from Noon to 12:50 PM, in APM B412.
- Your course grade will be based on your performance on the homework assignments, of which there will be 5 or 6.
- The official prerequisite for this course is Math 180A (an upper-division Introduction to Probability course). Experience with martingales and conditional expectations is a plus, but we will develop these ideas along the way.

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This handout and other course information is available on the Math 294 Canvas page, or at

`http://math.ucsd.edu/~pfitz/spring24/294/`