Math 530: Mathematics of Finance (Spring 2019)

Professor: Ryan Hynd (rhynd@math.upenn.edu)

Office: 4N42 DRL

Class schedule: Tuesday and Thursday 10:30am–12:00pm

Location: DRL 4C8

Office hours: Wednesday 4:30–6pm

Grader: Matthew Klein (mpwiener@sas.upenn.edu)

Description: The class is about mathematical modeling in finance. The core material will involve the Black–Scholes option pricing model. However, we will discuss additional topics, and you will write a paper based on another mathematical model in finance.

Black–Scholes theory topics
The Binomial Model
Brownian motion and stochastic calculus
Risk neutral pricing for European options
Barrier options
Asian options
American options

Textbooks: Two books by Steven Shreve
“Stochastic Calculus for Finance I: The Binomial Asset Pricing Models” (Chapter 1-2)
“Stochastic Calculus for Finance II: Continuous-Time Models” (Chapters 1-8)

Grading breakdown: 50% for HW, 10% for a mid-term exam, 15% for a final exam, and 25% for a research paper. Having good attendance is a requirement for passing this course.

HW: An assignment will be due most weeks. You may work with your classmates, but you will need to write your solutions individually. Your lowest percentage HW grade will be dropped.

Research paper: Students will work together in groups of 3 and submit a research paper jointly. However, each student in a group will be responsible for writing one section of the paper. I will help to select groups, based on students’ interests, and I will help guide groups in choosing their research topics.
Course deadlines and important dates:
Midterm Exam: February 26
No class on February 28
Spring Break: March 4–8
A list of modeling topics you are interested in and your group, due March 14
Research proposal, due March 26
Research paper draft, due April 16
Research Paper due date: April 30
Final Exam: TBA