MATH 5660–001

Advanced Financial Mathematics[1]

Instructor: Dr. George Yin, gyin@uconn.edu

Term: 2024 Spring

Lectures: Tuesdays and Thursdays, 11:00 am-12:15 pm, MONT 314

Office Hours: Tuesdays and Thursdays 10:45 am-11:00 am [MONT 314]; Tuesdays and Thursdays 1:15 pm-2:15 pm [WebEx: I will have the WebEx page open at the indicated times. However, sending me an email in advance is a good idea.]

Link: 1/18/2024-4/25/2024 [except Springbreak]

Meeting link:
https://uconn-cmr.webex.com/uconn-cmr/j.php?MTID=m195537115dc079c8af54dd88e1fe9781
Meeting number: 2634 287 0439
Password: wDT6jZXcS43

References:

- Steven Shreve, *Stochastic Calculus for Finance II - Continuous Time Models* (required text)
- Steven Shreve, *Stochastic Calculus for Finance I - The Binomial Asset* (reference)

Course Objectives Learning Outcomes. This is a required course for the Professional Master's degree in Applied Financial Mathematics (containing material relevant for SOA MFE exam). By the end of the semester, you should be able to:

- understand the basic notion of risk-neutral model
- understand and carry out the pricing and hedging derivative financial instruments using the theory of continuous stochastic processes and stochastic calculus

Methods of Evaluation: There will be homework assignments, an in-class presentation, an in-class mid-term exam, and a comprehensive take-home exam. Performance on these is the primary basis for the course grade.

Homework	12	3%
Mid-term	100	29%
Take-Home Exam	150	43%
Presentation	88	25%
Total	350	100%

[1]This syllabus provides a general plan for the course; some modifications and derivations may be needed.

Course Description:

> An introduction to the standard models of modern financial mathematics including martingales, the binomial asset pricing model, Brownian motion, stochastic integrals, stochastic differential equations, continuous time financial models, completeness of the financial market, the Black-Scholes formula, the fundamental theorem of finance, American options, and term structure models.

Plan:

> We will cover the first six chapters and selected materials from the rest of the textbook, and some other materials in stochastic processes and stochastic portfolio theory.

Important Dates: Jan. 29 - courses dropped after this date will have a "W" for withdrawal recorded on the academic record. Last day to add/drop courses without additional signatures. April 8 - last day to drop a course, last day to place courses on or remove from Pass/Fail grading.

Academic, Scholarly, and Professional Integrity and Misconduct Policy: See https://policy.uconn.edu/2023/07/11/academic-scholarly-and-professional-integrity-and-misconduct-aspim-policy-on/

Policy on Makeup Exams: I plan to give no makeups. Thus, if you have an actual *emergency* which prevents you from taking an exam, I will need *convincing evidence* in order to be willing to accommodate your special situation.

Policy on Late Homework: It is important to observe the due date of the homework (project). A late homework will result in a reduction of 25% of the points for each day delayed.

Students with Disabilities: The University of Connecticut is committed to protecting the rights of individuals with disabilities and assuring that the learning environment is accessible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, please let me know immediately so that we can discuss options. Students who require accommodations should contact the Center for Students with Disabilities, Wilbur Cross Building Room 204, (860) 486-2020 or http://csd.uconn.edu/.