



FIN 210 Mathematical Finance

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

The course provides students with advanced knowledge and understanding of the main theoretical and applied concepts in mathematical finance. Topics include mathematical theory and modelling, scientific computing and partial differential equations to derive relations between asset prices and interest rates, and to develop models for asset pricing, risk management and financial product development. Students shall dissect financial models by isolating their central assumptions and conceptual building blocks.

Upon Completion of this Course, students will be able to:

1. Employ methods related to these concepts in a variety of financial applications;
2. Apply logical thinking to problem solving in context;
3. Use appropriate technology to aid problem solving;
4. Demonstrate skills in writing mathematics.

PREREQUISITES

N/A

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM

POINTS



Assignments	20 Points
Quizzes	20 Points
Midterm	25 Points
Final Exam	35 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Mathematics for Finance: An Introduction to Financial Engineering by Marek Capinski, Tomasz Zastawniak, Springer, 2003.

Recommended (Optional) Texts or Other Materials:

None.

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Course Introduction: A Simple Market Model; No-Arbitrage Principle Topic 2: Risk and Return Topic 3: Forward Contracts Topic 4: One-Step Binomial Model Topic 5: Call and Put Options; Managing Risk with Options Assessments: Quiz#1
Module 2	Topics: Topic 6: Time Value of Money Topic 7: Money Market Topic 8: Dynamics of Stock Prices Topic 9: Binomial Tree Model Topic 10: Trinomial Tree Model; Continuous-Time Limit Assessments:



	Assignment#1
Module 3	<p>Topics: Topic 11: Investment Strategies Topic 12: The Principle of No Arbitrage Topic 13: Application to the Binomial Tree Model Topic 14: Fundamental Theorem of Asset Pricing Topic 15: Extended Models</p> <p>Assessments: Midterm Quiz#2</p>
Module 4	<p>Topics: Topic 16: Risk; Two Securities Topic 17: Capital Asset Pricing Model Topic 18: Forward Contracts Topic 19: Options: General Properties Topic 20: Put-Call Parity</p> <p>Assessments: Assignment#2</p>
Module 5	<p>Topics: Topic 21: Bounds on Option Prices Topic 22: Variables Determining Option Prices; Hedging Option Positions; Hedging Business Risk Topic 23: Maturity-Independent Yields Topic 24: General Term Structure Topic 25: Arbitrage Pricing of Bonds</p> <p>Assessments: Final Exam</p>

STUDY HOURS OF LEARNING ACTIVITIES

ACTIVITY FORM	ACTIVITY HOURS
Lectures	40
Tutorials	16
Assignments and Tests	26
Self-Study	48
Total	130

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to



decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university



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administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.