



蘇州大學
Soochow University

MAT 238 Introductory Financial Mathematics

Fall 2023

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course is a basic introduction to finance. It starts by making an introduction to the value of money, interest rates and financial contracts, in particular, what are fair prices for contracts and why no-one uses fair prices in real life. Then, there is a review of probability theory followed by an introduction to financial markets in discrete time. In discrete time, one will see how the ideas of fair pricing apply to price contracts commonly found in stock exchanges. The next block focuses on continuous time finance and contains an introduction to the basic ideas of Stochastic calculus. The last chapter is an overview of Actuarial Finance.

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

1. Apply basic probability theory to option pricing in discrete time in the context of simple financial models
2. Comprehend the principles of financial transactions and their mathematical representation
3. Understand the principles and techniques of financial mathematics and the concepts of real and nominal interest rates
4. Master equation of value methods for evaluating financial transactions
5. Learn time value of money methods and their practical implications

PREREQUISITES

FIN 100 Introductory Finance



GRADING

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

ITEM	POINTS
Quizzes	20 Points
Midterm 1	20 Points
Midterm 2	20 Points
Final Exam	40 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:

Shreve, Steven (Springer Finance) 2004. *Stochastic Calculus for Finance I: The Binomial Asset Pricing Model*.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	<p>Topics: Topic 1: Introduction to financial markets and financial contracts Topic 2: Value of Money Topic 3: Basic Investment Strategies and Fundamental Concepts of No-arbitrage Topic 4: Data Analysis in Financial Markets</p> <p>Assessments: Quiz#1</p>



Module 2	Topics: Topic 5: Descriptive Statistics and Probability Distributions Topic 6: Correlation and Regression Analysis Topic 7: Actuarial Modeling in Finance Topic 8: Principles of Actuarial Modeling Assessments: Quiz#2
Module 3	Topics: Topic 9: Risk Assessment and Management and Insurance Mathematics Topic 10: Bond Pricing Methods Topic 11: Pricing Principles for Fixed-income Securities, Yield Curves and Term Structure of Interest Rates Topic 12: Assets Replication Assessments: Midterm#1
Module 4	Topics: Topic 13: Replication Strategies for Financial Assets Topic 14: Time Value of Money Topic 15: Compound Interest Rates and Present Value of Future Payments Topic 16: Project Appraisal Methods Assessments: Midterm#2
Module 5	Topics: Topic 17: Net Present Value (NPV) Analysis Topic 18: Internal Rate of Return (IRR) Analysis Topic 19: Mathematical Modeling of Financial Markets Topic 20: Portfolio Optimization Techniques Assessments: Final Exam

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

DISABILITY ACCOMMODATION



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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.