

An Introduction to Math Finance

Department: Fudan International Winter Session 2026

Course Code	TBA						
Course Title	An Introduction to Math Finance						
Credit	3	Experiment (including Computer) Credit	0	Practice Credit	0	Aesthetic Education Credit	0
Credit Hours	48 tutorial hours in total+3 office hours (one credit hour is 45 minutes)	Education on The Hard-Worki ng Spirit Credit Hours	0	Language of Instruction	English	Honors Course	☐ Yes ☒ No
Course Type	☐ Core General Education Course ☐ Specific General Education Course ☐ Basic Course in General Discipline ☒ Others			2+X Major : ☐ Professional Core Course ☒ Professional Advanced Course Non 2+X Major : ☐ Professional Compulsory Course ☒ Professional Elective Course			
Course Objectives	This course aims to prepare students with mathematical thinking in the financial industry. It consolidates the mathematical foundations for understanding financial products, investment, and risk management. It trains students with two big hands-on projects.						
Course Description	This course provides mathematical foundations for undergraduate students aiming for the financial industry. It includes fixed income pricing, forwards and futures, yield curves, no-arbitrage pricing, options pricing and Black-Scholes formula, portfolio investment, trading, hedge fund, and risk management etc.						
Course Requirements: Calculus; Linear Algebra;							
Teaching Methods: Offline teaching							
Course Director's Academic Background: Shuangjian Zhang received his Ph.D. in mathematics from the University of Toronto in 2018. Thereafter, he worked and taught abroad for five years before joining Fudan University. He taught 5 mathematical courses							

in English. His research interests include mathematical finance and economics. His papers were published in top-ranked journals in math.

Instructor's Academic Background:

Members of Teaching Team

Name	Gender	Professional Title	Department	Responsibility
Shuangjian Zhang	Male	Young Investigator	School of Mathematical Sciences	Course Director, to build and teach the course

Course Schedule:

Lecture 1: Introduction to financial industry and financial products
 Lecture 2: Bond and bond pricing
 Lecture 3: Stock pricing
 Lecture 4: Discrete time market models
 Lecture 5: Portfolio investment
 Lecture 6: Forward and futures pricing
 Lecture 7: Options; Assignment 1 release date
 Lecture 8: Option pricing; Black-Scholes formula
 Lecture 9: Trade and hedge fund
 Lecture 10: Yield curve; Assignment 1 due date
 Lecture 11: Risk Management: an introduction
 Lecture 12: Credit risk
 Lecture 13: Liquidity risk; Assignment 2 release date
 Lecture 14: Foreign exchange risk
 Lecture 15: Market risk
 Lecture 16: Monte Carlo and other statistical methods; Assignment 2 due date

The design of class discussion or exercise, practice, experience and so on:

If you need a TA, please indicate the assignment of assistant:

Grading & Evaluation:

20% Participation + 30% Assignment 1 + 30% Assignment 2 + 20% * max {Assignment 1, Assignment 2}

Usage of Textbook: ☐ Yes (complete textbook information form below) ☒ No

Textbook Information (No more than two textbooks) :

Title	Author	ISBN	Publishing Time	Publisher	Type I	Type II

Teaching References:

1. Capiński, M., & Zastawniak, T. (2010). Mathematics for Finance: An Introduction to Financial Engineering. Springer London. ISBN: 9780857290816
2. Saunders, A., Cornett, M. M., & Erhemjams, O. (2020). Financial institutions management: A risk management approach. McGraw Hill. ISBN: 9781260013825
3. Campolieti, G., & Makarov, R.N. (2014). Financial Mathematics: A Comprehensive Treatment (1st ed.). Chapman and Hall/CRC. ISBN: 9780429468889
4. Rüschendorf, L. (2013). Mathematical risk analysis. Springer Ser. Oper. Res. Financ. Eng. Springer, Heidelberg. ISBN: 9783642335907
5. Crouhy, M., Galai, D., & Mark, R. (2006). The essentials of risk management (Vol. 1). New York: McGraw Hill. ISBN: 978-0071818513
6. Jorion, P. (2007). Value at risk: the new benchmark for managing financial risk. McGraw Hill. ISBN: 978-0071464956