

# IEDA 3330 INTRODUCTION TO FINANCIAL ENGINEERING

2024 Fall

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<b>Instructor:</b> Wei JIANG	<b>Office hour:</b> By appointment
<b>Email:</b> <a href="mailto:weijiang@ust.hk">weijiang@ust.hk</a>	<b>Office:</b> 5548

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## Class Time and Location

The lectures are 4:30 pm to 5:50 pm on Wednesday and Friday at classroom 1410. In addition, the tutorial is 6:00 pm to 6:50 pm on Monday at R1034 LSK. In regular lectures, you will learn theoretical models and quantitative methods. In tutorial hours, TA (Mr. Shize LI, [slidq@connect.ust.hk](mailto:slidq@connect.ust.hk)) will give tutorial lectures and answer questions from lectures and homework (one tutorial lecture each two weeks, 6-7 times in total).

## Course Schedule

The schedule is tentative and subject to changes

- Week 1: Introduction
- Week 2: Financial Markets, institutions, and instruments
- Week 3 to 4: Fixed Income Securities: theory of interest, bond price and term structure
- Week 5 to 6: Mean-variance analysis
- Week 7 to 8: Capital asset pricing model, factor model, and arbitrage pricing theory
- Week 9 to 10: Basic derivative theory and risk management
- Week 11: Risk aversion, expected utility, and portfolio decisions
- Week 12 to 13: Basic FinTech theory: AI in finance, robo-advising, cryptocurrencies and blockchain, green finance, etc.

## References

Investment Science by Luenberger, D. G.

Options, Futures, and Other Derivatives by John Hull

Financial Markets and Institutions by Frederic S. Mishkin and Stanley G. Eakins

## Objective

After the course, the students are expected to understand the basic knowledge of financial system (structure of financial markets, financial institutions, and financial instruments), quantitative models of fixed income securities (such as theory of interest, bond pricing, and term structure), the classic mean-variance analysis and equilibrium models in pricing assets (i.e., capital asset pricing model, factor model, arbitrage pricing theory), basic option theory, and basic FinTech theory. The students will be endowed with basic knowledge and quantitative skills for financial engineering.

## Homework and Exams

There are about 5 times of homework. Homework is usually posted on Wednesday. For paper homework, it is due in two weeks and you are asked to submit in class or online. The expected workload is about four to eight hours per week excluding lectures. There will be two in-class exams (can be taken online if necessary): midterm exam and final exam.

## Grade

Tentative: Participation (10%), homework (20%), exam 1 & 2 (40%), group project (30%).

## Learning Resources


Google, stackoverflow, office hour.

## Teaching Philosophy

- Financial engineering requires a reasonably solid background of mathematics, programming, and financial intuition.
- You are encouraged to ask questions in class. No questions are stupid. Usually it is because I didn't explain it clearly enough or the problem is difficult.
- Financial engineering is a topic that can span three or more courses. This course provides basic introduction to financial engineering. The more you get curious about, the more you read/ask me after class, the more you learn.
- For homework, discussing with classmates is allowed; copying without thinking and digesting is not.

## Academic Honesty

Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

 I certainly impose a sanction on the student committed to any academic fraud. It varies depending upon the instructor's evaluation of the nature and gravity of the offense. Possible sanctions include but are not limited to, the following: (1) Require the student to redo the assignment; (2) Require the student to complete another assignment; (3) Assign a grade of **zero** to the assignment; (4) Assign a final grade of **zero** for the whole course.