

Spring, 2025

**The Chinese University of Hong Kong
Department of Economics**

Eco 4450 Economics of Derivatives

Instructor: DU, Julian

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Teaching Assistant: SUN, Hongrui (hongruisun@link.cuhk.edu.hk)

Schedule: Thursdays, 2:30- 5:15pm; YIA LT8

Textbook: *Fundamentals of Futures and Options Markets*, by John C. Hull, Pearson-Prentice Hall.

Suggested Reference Readings:

Futures, Options, and Swaps, by Robert W. Kolb, 2nd edition, Blackwell Publishers, 1997.

Derivatives: An Introduction, by Robert A. Strong, South-Western, a division of Thomas Learning, 2002.

Course Description:

This course is designed as an introduction to the market of derivative securities. It will provide detailed explanations of institutional background for derivatives markets. It will also cover most of the widely used derivative securities in practice, such as forward and futures contracts, swaps and various options. During the course, we shall discuss such topics as the uses of derivatives in risk management, valuation of derivatives, the risk-neutral valuation principle, the Black-Scholes formula and binomial trees.

This course will provide many examples to illustrate the fundamental methods of pricing derivative securities. It will also cover a few real-world cases to encourage students to apply theory to practice.

Course Requirements:

Throughout the course, we will have three individual-based homework assignments (10%), one group report/project (40% in total), and one **open-book final exam** (50%). For the group project, no more than 4 students each group; group presentation of project proposal or work in progress in the final teaching weeks is required, and group presentation performance makes up 4% of the overall score; group report quality accounts for 33% of the overall score. In addition, each group is required to write comments on two groups' presentations, which accounts for 3% of the overall score.

The TA will run tutorials to discuss the course material and homework assignments. The final exam will be centrally arranged during the final exam period. The group project report will be due in the mid-May, 2024. In submitting a group essay, group members should sign a statement that declares their assessment of whether each member has made due contribution to the project, and their willingness to be assigned the same score for the group report.

Outline of Topics

1. Introduction to Derivatives Securities
2. Mechanics of Futures and Forward Markets
3. Forward Pricing
4. Commodity Contracts
5. Hedging Strategies Using Futures
6. Mechanics of Options Markets
7. Properties of Stock Options
8. Trading Strategies Involving Options
9. Binomial Option Pricing
10. Black-Scholes Option Pricing
11. Swaps
12. Volatility Smiles
13. Greek Letters
14. Value at Risk