



BU463 Risk Management and Derivatives (Postgraduate) (Online)

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| Instructor Information | <p style="text-align: center;">Ying Wang Home Institution: East China Normal University Email: ywang@fem.ecnu.edu.cn</p> | | |
| Term | December 13, 2021 - January 7, 2022 | Credits | 4 units |
| Course Delivery | <p>The class will be delivered in the format of online. Other than recorded lecture videos, the instructor will arrange 3-6 hours' real-time interactions with students per week (via discussion forum, zoom meeting, and WeChat). The workload students are expected to complete to properly pass this course is about 10-15 hours per week.</p> | | |
| Required Texts (with ISBN) | <p style="text-align: center;">Options, Futures, and Other Derivatives, 10th Edition, John C. Hull, Pearson Press</p> | | |
| Prerequisite | <p style="text-align: center;">N/A</p> | | |



Course Overview

This course covers derivatives such as options, forward contracts, futures contracts, and swaps. Students will learn to make decisions by taking into account such features as interest rates, and rates of return. They will learn about the concept of arbitrage, and when consideration of such is sufficient to price different investments. Applications to call and put options will be given.

Learning Outcomes

1. Students will learn when arbitrage arguments are not sufficient to evaluate investment opportunities.
2. Students will learn to make use of utility theory and mathematical optimization models to determine optimal decisions.
3. Dynamic programming will be introduced and used to solve sequential optimization problems.
4. The use of simulation in financial engineering will be explored.

Course Procedure

The subject is taught in lectures, tutorials, and self-managed learning materials in print and electronic formats. The lectures provide the structure of the topic area, discussion of the theory and some practical examples. The tutorials provide an opportunity to discuss ideas, ethical issues and make practical application of these theories to financial investment and innovation. Students are expected to at least attempt to solve these questions beforehand and actively participate in tutorial discussions.

Lecture Materials

Course Text: Options, Futures, and Other Derivatives, 10th Edition, John C. Hull, Pearson Press

Reference Book: 《Fundamentals of Futures and Options Markets》 《Introduces Quantitative Finance》



Grading Policy

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| Assignments | 20% |
| Mid-term exam | 30% |
| Final Exam | 50% |

Grading Scale is as follows

| Number grade | Letter grade | GPA |
|--------------|--------------|-----|
| 90-100 | A | 4.0 |
| 85-89 | A- | 3.7 |
| 80-84 | B+ | 3.3 |
| 75-79 | B | 3.0 |
| 70-74 | B- | 2.7 |
| 67-69 | C+ | 2.3 |
| 65-66 | C | 2.0 |
| 62-64 | C- | 1.7 |
| 60-61 | D | 1.0 |
| ≤59 | F (Failure) | 0 |

Lecture: Each lecture will be uploaded on SJTU SCE online learning platform on a daily basis. Students are required to watch them according to the course schedule.

Discussion: There will be 4 hours open session on ZOOM every week. The attendance of the discussion is important as it is part of your final score.

Office hours: For online courses, we use WeChat to answer questions. Students can leave a message to ask questions at any time, and the teacher will answer them within 24 hours

Exam:

Online exam (3.5 hours)

- Mid-term exam (1.5 hours)
- Final exam (2 hours)



Class Schedule

| Date | Lecture | Readings | Online Teaching Arrangement |
|--------|--|--|---|
| Day 1 | Introduction | Chapter 1 | approximately 60-90 minutes pre-recorded video lectures |
| Day 2 | Futures Markets and Central Counterparties | Chapter 2 | approximately 60-90 minutes pre-recorded video lectures |
| Day 3 | Hedging Strategies Using Futures | Chapter 3 | approximately 60-90 minutes pre-recorded video lectures |
| Day 4 | Interest Rates | Chapter 4 | approximately 60-90 minutes pre-recorded video lectures |
| Day 5 | Determination of Forward and Futures Prices | Chapter 5 | approximately 60-90 minutes pre-recorded video lectures |
| Day 6 | Interest Rate Futures | Chapter 6 | approximately 60-90 minutes pre-recorded video lectures |
| Day 7 | Swaps | Chapter 7 | approximately 60-90 minutes pre-recorded video lectures |
| Day 8 | Securitization and the Credit Crisis of 2007 | Chapter 8 | approximately 60-90 minutes pre-recorded video lectures |
| Day 9 | Review/Assignment due | | Zoom/Tencent meeting |
| Day 10 | Mid-term Exam | N/A | Online |
| Day 11 | Mechanics of Options Markets | Chapter 10 | approximately 60-90 minutes pre-recorded video lectures |
| Day 12 | Properties of Stock Options Options on stock indices and currencies Exotic options | Chapter 11 Chapter 17 Chapter 26 | approximately 60-90 minutes pre-recorded video lectures |
| Day 13 | Trading Strategies Involving Options | Chapter 12 | approximately 60-90 minutes pre-recorded video lectures |
| Day 14 | Binomial Trees | Chapter 13 | approximately 60-90 minutes pre-recorded video lectures |
| Day 15 | Wiener processes and Ito's lemma The Black-Scholes-Merton Model | Chapter 14 Chapter 15 | approximately 60-90 minutes pre-recorded video lectures |



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| Day 16 | The Greek letters | Chapter 19 | approximately 60-90 minutes pre-recorded video lectures |
| Day 17 | Volatility smiles | Chapter 20 | approximately 60-90 minutes pre-recorded video lectures |
| Day 18 | Value at risk and expected shortfall Martingales and measures | Chapter 22 Chapter 28 | approximately 60-90 minutes pre-recorded video lectures |
| Day 19 | Review/Assignment due | | Zoom/Tencent meeting |
| Day 20 | Final Exam | N/A | Online |

* Fee-paying (non-exchange) program held by School of Continuing Education, SJTU.

* 此课程由上海交通大学继续教育学院开设，所提供课程不包括在上海交通大学与海外高校校级合作的学分互认范畴之内。