



## Shanghai Jiao Tong University

### BU463 Risk Management and Derivatives (Postgraduate, Online)

<b>Instructor Information</b>	Ying Wang Home Institution: East China Normal University Email: ywang@fem.ecnu.edu.cn		
<b>Term</b>	June 28, 2021 - July 23, 2021	<b>Credits</b>	4 units
<b>Course Delivery</b>	The class will be delivered in the format of online. Other than recorded lecture videos, the instructor will arrange 3-5 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.		
<b>Required Texts (with ISBN)</b>	Options, Futures, and Other Derivatives, 10th Edition, John C. Hull, Pearson Press		
<b>Prerequisite</b>	N/A		



## 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

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



### Class Schedule

Date	Lecture	Readings	Online Teaching Arrangement
Day 1	Introduction	Chapter1	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



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