



## Shanghai Jiao Tong University

### BU463 Risk Management and Derivatives (Postgraduate)

<b>Instructor Information</b>	Zhu Jie Home Institution: Shanghai University Email: zhu_jie@t.shu.edu.cn Office Hours: Determined by Instructor		
<b>Term</b>	June 28, 2021 - July 23, 2021	<b>Credits</b>	4 units
<b>Class Hours</b>	Monday through Friday, 120 mins per teaching day		
<b>Discussion Sessions</b>	2.5 hours each week, conducted by teaching assistant(s)		
<b>Total Contact Hours</b>	66 contact hours (1 contact hour = 45 mins, 3000 mins in total)		
<b>Required Texts (with ISBN)</b>	Options, Futures, and Other Derivatives, 10th Edition, John C. Hull, Pearson Press		
<b>Prerequisite</b>	N/A		
The course might be moved to online delivery due to COVID-19 pandemic. Students will be notified once the decision is made.			



## 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

Assignment1 & 2	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

Due to the on-going pandemic, there is a possibility that in-person courses move to online delivery. Students will be notified once the decision is made.

If the in-person courses are to be changed to online courses, we will make a few adjustments:

**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:

Assignment1 & 2	20%
Mid-term exam	30%
Final Exam	50%

Online exam (3.5 hours)

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



## Class Schedule

Date	Lecture	Readings
Day 1	Introduction	Chapter 1
Day 2	Mechanics of Futures Markets	Chapter 2
Day 3	Hedging Strategies Using Futures	Chapter 3
Day 4	Interest Rates	Chapter 4
Day 5	Determination of Forward and Futures Prices	Chapter 5
Day 6	Interest Rate Futures	Chapter 6
Day 7	Swaps	Chapter 7
Day 8	Securitization and the Credit Crisis of 2007	Chapter 8
Day 9	Review/Assignment due	
Day 10	Mid-term Exam	
Day 11	Mechanics of Options Markets	Chapter 9
Day 12	Properties of Stock Options	Chapter 10
Day 13	Trading Strategies Involving Options	Chapter 11
Day 14	Binomial Trees	Chapter 12
Day 15	The Black-Scholes-Merton Model	Chapter 13
Day 16	Employee stock options	Chapter 14
Day 17	Options on Stock Indices and Currencies	Chapter 15
Day 18	Futures Options	Chapter 16
Day 19	Review/Assignment due	
Day 20	Final Exam	