



BU463 Risk Management and Derivatives (Postgraduate)

Instructor Information	Haigang Li Home Institution: Shanghai Jiao Tong University Email: lihg@sjtu.edu.cn Office Hours: Determined by Instructor		
Term	December 13, 2021 - January 7, 2022	Credits	4 units
Class Hours	Monday through Friday, 120 mins per teaching day		
Discussion Sessions	2.5 hours each week, conducted by teaching assistant(s)		
Total Contact Hours	66 contact hours (1 contact hour = 45 mins, 3000 mins in total)		
Required Texts (with ISBN)	Options, Futures, and Other Derivatives, 10th Edition, John C. Hull, Pearson Press		
Prerequisite	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	Teaching Arrangement
Day 1	Introduction	Chapter 1	120 minutes lectures
Day 2	Futures Markets and Central Counterparties	Chapter 2	120 minutes lectures
Day 3	Hedging Strategies Using Futures	Chapter 3	120 minutes lectures
Day 4	Interest Rates	Chapter 4	120 minutes lectures
Day 5	Determination of Forward and Futures Prices	Chapter 5	120 minutes lectures
Day 6	Interest Rate Futures	Chapter 6	120 minutes lectures
Day 7	Swaps	Chapter 7	120 minutes lectures
Day 8	Securitization and the Credit Crisis of 2007	Chapter 8	120 minutes lectures
Day 9	Review/Assignment due		
Day 10	Mid-term Exam	N/A	In-class
Day 11	Mechanics of Options Markets	Chapter 10	120 minutes lectures
Day 12	Properties of Stock Options Options on stock indices and currencies Exotic options	Chapter 11 Chapter 17 Chapter 26	120 minutes lectures
Day 13	Trading Strategies Involving Options	Chapter 12	120 minutes lectures
Day 14	Binomial Trees	Chapter 13	120 minutes lectures
Day 15	Wiener processes and Ito's lemma The Black-Scholes-Merton Model	Chapter 14 Chapter 15	120 minutes lectures
Day 16	The Greek letters	Chapter 19	120 minutes lectures
Day 17	Volatility smiles	Chapter 20	120 minutes lectures
Day 18	Value at risk and expected shortfall Martingales and measures	Chapter 22 Chapter 28	120 minutes lectures
Day 19	Review/Assignment due		
Day 20	Final Exam	N/A	In-class