NATIONAL UNIVERSITY OF SINGAPORE

Department of Finance

FIN3712: Options and Futures

Semester 2, 2022/2023

Instructor: **Assoc Prof LEE Hon Sing**
Office: **MRB BIZ1 7-75**
Telephone: **6516-5665**
E-mail: **honsing@nus.edu.sg**
Consultation Hrs: By appointment through email

Course Objective

The module provides an in-depth analysis of the theories and models that are essential to the understanding of contingent claims. The course covers topics on mathematics of financial derivatives, stochastic models of securities price movements, Black-Scholes analysis and risk-neutral valuation, analytical and numerical procedures for various option-embedded products. Students reading this module are expected to have some basic knowledge of options and futures.

Methodology/Pedagogy

The main coursework shall follow closely the text book by Chance and Brooks (see below). This is a renowned textbook in the industry widely adopted in MBA programs. This is also the recommended text for the CFA level 1 exam. The coursework will be mainly assessed by a mid-term quiz and a final quiz.

Requirements for the Course

Prerequisites

FIN2704 Finance
FIN3702 Investment Analysis and Portfolio Management

Recommended Textbooks

(CB) Introduction to Derivatives and Risk Management by Don M. Chance, Roberts Brooks (2015), 10th edition, Cengage Learning, ISBN-13: 978-1305104969

Optional Reference Textbooks

(H) Options, Futures, and Other Derivatives by John C Hull (2014), 9th Edition, Pearson, ISBN-13: 978-0133456318

Financial Calculators

I strongly recommend the Texas Instruments BA II plus financial calculator. This is one of the only two approved calculator for the CFA examinations. Hence it is good to start using it and be familiar with it. It is also durable and suitable for professional work. The other approved calculator is the HP 12C financial calculator. This is also a durable and robust calculator suitable for professional work.

Reference: http://www.cfainstitute.org/cfaprog/resources/examdetails/policies/calculator.html

If you are not concerned about the CFA examinations, then other financial calculators include models from Casio, Sony, etc. One particular calculator I would like to recommend is the Texas Instruments TI84+ (includes the older model TI83+). This is an extremely bulky graphic calculator (popularly called the "GC" among students) that is not approved in the CFA examinations, but approved in the NUS and other popular examinations such as the GCE "A" level examinations. In fact it has become indispensable among the JC students. This calculator not only has financial calculator functionalities but also scientific calculator functionalities. Hence it saves the students from carrying both the scientific calculator and the financial calculator in the examination. It can also plot graphs, which can be used for plotting the NPV profile and the derivative payoff diagrams. It has the normal distribution values within it, saving the students from referring to statistical tables. Finally it is programmable, and thus can be programmed to compute the Black Scholes put and call prices.

Assessment

The weight distribution for different components is as follows:

Mid-Term Quiz	30
Final Quiz	30
Group Project	30
Class Participation	10
Total	**100**

Mid-Term Quiz

Date: Lesson 7
The mid-term quiz will be a 2-hour open-book test covering lessons 1 to 6. It will be held during class hours. Students are to make sure that they are available to sit for the mid-term quiz.

Final Examination

Date: Lesson 13
The final quiz will be 2-hour close-book and covering lesson 8 to 12. Students are to make sure that they are available to sit for the exam.

Group Project: Introduction to Derivative Instruments

Each seminar class will have project groups of 5 students each. Each group is to make a 10 min presentation and 3000-word report on one of the following topics (assigned to group):

1) Treasury bond futures and market
2) Energy futures and market
3) Interest rate futures and market
4) Eurodollar futures and market
5) Equity Index futures and market
6) FX futures and market
7) Agriculture futures and market
8) Metal futures and market
9) VIX and market
10) Option on Treasury bond futures and market

There will be one group presentation at the beginning of each lesson. PPT and final report to be submitted on presentation day.

Plagiarism check

The group project will be subjected to plagiarism check within the Canvas. The program takes a serious view on plagiarism. For more information please refer to:
http://www.cdtl.nus.edu.sg/success/sl7.htm

Class participation

Students are strongly encouraged to participate in class via sharing their views, asking questions and answering adhoc questions during class. Students who are absent for a class session will not earn class participation point for that session.

Other points to note

- **Attendance**: Students are strongly encouraged to attend class. Students who are absent for a class session will not earn class participation point for that session.
- **CA Attendance**: Students who miss any CA component will receive zero marks for that particular component. Absentees due to medical (accompanied by medical certificates) or compassionate reasons may be given a substitute form of assessment.
- Students are encouraged to always feedback to the instructor comments and suggestions that may help the class to learn better.
- Students are to check the Canvas weekly for announcements.
- Please use the forum in Canvas exclusively for students' discussions
- Please use NUS e-mail for e-mail communications

Tentative Lesson Schedule:

Lesson	Topic and Activity	Chapters
1	Introduction Structure of Derivatives Market	1,2
2	Principles of Option Pricing	3
3	Option Pricing Models: The Binomial Model	4
4	Option Pricing Models: The Black-Scholes-Merton Model	5
5	Basic Option Strategies, Advanced Option Strategies	6, 7
6	Valuation of Structured Products through Monte Carlo Simulation	Lecture Notes
7	***Mid-Term Quiz (2 hours)***	
8	Principles of Pricing Forwards, Futures, and Options on Futures Futures Arbitrage Strategies	8, 9
9	Forward and Futures Hedging, Spread, and Target Strategies	10
10	Swaps Interest Rate Forwards and Options	11, 12
11	Advanced Derivatives and Strategies	13
12	Financial Risk Management Techniques and Applications Managing Risk in an Organization	14, 15
13	***Final Quiz (2 hours)***	