



Laboratory in FINANCIAL RISK MANAGEMENT
April/May 2023

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Office Hours: By Appointment, please send me an email.

Textbooks: Hull, J. **Fundamentals of Futures and Options Markets**, 7th or 8th or 9th Edition
(N.B. If you follow the lectures closely, and study the Power Point slides, then the textbook is not really needed).

Prerequisites: A basic Finance course, an open mind, a good quantitative background (only if you have it), and a good sense of humor.

Course Structure and Description:

Classes will consist primarily of lectures, problem solving sessions, and class discussions. In this course you will learn about options and futures markets and risk management for modern multinational corporations (MNCs).

Learning objectives:

There are 3 primary objectives for this course:

- (1) help students understand the basics of financial derivatives like options, forwards, futures, and swap contracts.
- (2) how to use the Binomial Model as the basic framework to obtain arbitrage-free prices of Call and Put options, Forwards and Futures contracts. The emphasis is on intuitive understanding of the pricing models rather than mathematical derivations.

And

- (3) understand various investment strategies that combine Call and Put options with the underlying stock, or Exchange Traded Funds (ETFs).



Expected learning outcomes:

At the end of the Laboratorio, students will 1) Know how to compute gains/losses from going long or short futures contracts; 2) how to create synthetic securities using stocks and bonds; 3) understand how to trade (speculate with) Futures contracts, and Call and Put options in bullish and bearish markets.

"I'm a great believer in luck, and I find the harder I work, the more I have of it." -- Thomas Jefferson

Tips on how to prepare for classes

(1) Skim the assigned chapter for an overview.

(2) Work the assigned problems before, during and after classes.

Understanding the solutions to homework problems is one key for doing well on exams.

(3) If possible, join a study group.

(4) Be sure to *rewrite* your notes from the textbook, class notes, and homework problems.

COURSE OUTLINE (TENTATIVE)

1. **Thursday April 27 8:30 AM to 10:30 AM, Aula 24**

Lecture 1: Introduction to Financial Risk Management

Hull ch 1, Questions and Problems (Q&P): 1, 3, 4, 5, 6, 17, 18, 19, 21, 22, 23. Plus Practice Exam

Project I: Option Trading Strategies

Class will be divided into groups. Each group will be assigned 10,000 Euros plus a trading strategy such as Long Stock/Short Call for a mildly bullish sentiment. You will need to select a stock or Exchange Traded Fund (ETF) plus a related put or call. These are very heavily traded in the U.S. (sorry I am not familiar with European Exchanges). You will need to log on to the NASDAQ website to keep a daily record of prices; of course, I will show how to do this. We will review the results the last day of classes. More details in the handout.

2. **Thursday April 27 12:30 PM to 2:30 PM, Aula 24**

Lecture 2: Introduction to Options

Hull ch 9, (Q&P): 1, 2, 3, 9, 10, 11, 12, 15, 21. Plus Practice Exam

Note: There are quite a few technical rules about options (e.g., Commission schedules, adjustments for stock splits and dividends) that are quite boring to learn and very easy to forget. You can learn more about these rules if/when you start trading options for your own account. Please read the chapter and just be aware of their existence; but you are not required to know them for this course.

3. **Friday April 28 12:30 PM to 2:30 PM, Aula 24**

Lecture 3: Introduction to Futures Contracts.

Hull ch 2, Q&P: 1, 3, 4, 5, 7, 11, 16, 17, 21. Plus Practice Exam

Lec 4: Hedging Strategies Using Futures.

Hull ch 3, Q&P: 6, 7, 18, 21, 24. Plus Practice Exam



4. **Tuesday May 2 8:30 AM to 10:30 AM, Aula 24**
Lec 5A: Arbitrage-Free Pricing of Forward and futures (Hull, Ch. 5)
Hull ch 5, Q&P: 2, 3, 4, 9, 10, 12. Plus Practice Exam
Project II: Trade Futures Contracts in class.
5. **Wednesday May 3 8:30 AM to 10:30 AM, Aula 24**
Lec 7: Swaps. Hull ch 7 Q&P: 1 and 2, plus Practice Exam
Lec 10: How to discover Options Prices (Bounds on Call and Put prices)
Hull ch 10, Q&P: 2, 3, 7, 9, 10, 11, 12, 14, 15. Plus Practice Exam
6. **Thursday May 4 8:30 AM to 10:30 AM, Aula 24**
Lec 11: Options Strategies. Hull ch 11, Q&P: 1, 4, 6, 7, 10, 11, 12, 15. Plus Practice Exam
Lec 12A: Binomial Option Pricing Model (BOPM) for Calls
7. **Friday May 5 8:30 AM to 10:30 AM, Aula 25**
Lec 12B: Binomial Option Pricing Model (BOPM) for Puts.
Hull ch 12, Q&P: 1, 4, 5, 6, 12, 13, 14. Plus Practice Exam
Lecture 13A: From Binomial Pricing to the Black-Scholes Option Pricing Model (No Dividend case)
Hull ch 13. The key idea here is the Black and Scholes model. The model is just a formula (like a cooking recipe) to find the option price. I hope you can obtain some intuitive understanding by focusing on the derivation in the lecture notes. Most of the end of chapter problems are not interesting; basically, they ask to “plug-in some numbers and get an answer”. The Black and Scholes formula will be provided on the exam (along with tables for $N(d1)$ and $N(d2)$).
8. **Monday May 8 8:30 AM to 10:30 PM, Aula 24**
Project III: Trade Options in virtual time.
9. **Tuesday May 9 8:30 AM to 10:30 PM, Aula 2 (Computer Lab)**
Excel Exercises for Options.
10. **Tuesday May 9 12:30 PM to 2:30 PM, Aula 2, (Computer Lab)**
Review Investment Project Results.