FINN 6210 / BPHD 8240: Financial Elements of Derivatives

Spring Semester, 2017

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Class: Tuesday 5:30-8:15 pm, CITY 501
Office hours: Center City before/after class at Room 713 faculty cubicles and by appointment
Course web page: Canvas

Course Description

This course examines derivatives which are securities whose values derive from (or are contingent on) the price of an underlying asset. The specific types of derivative securities we examine include forward and futures contracts, swaps, and options. We will learn how to value these securities and how to use them for risk management purposes. A central theme in our discussion on valuation is that there should be no opportunities for riskless arbitrage in well-functioning markets. We will learn the mechanics of futures and options trading and will implement trading strategies to mitigate various types of risk.

Learning Outcomes

Key concepts that students will learn in this course include:

- What are forward and futures contracts, and how are they used by market participants to hedge various types of price and/or quantity risks?
- How are futures prices determined, and what is the relation between futures prices and spot prices?
- How can firms use swaps to transform assets and liabilities from floating to fixed or from fixed to floating?
- How can individuals and firms use options to create alternative payoffs or to profit from any type of market environment?
- What are the important models to price options and how can we use these models to compute the Greeks?
- How can we use options to hedge investment portfolios?

Course Materials

1. **Textbook**: John C. Hull, *Options, Futures, and Other Derivatives*, 2015 (Pearson, Ninth Edition: ISBN-13: 978-0-13-345631-8). I also recommend that you pick up the solutions manual *Options, Futures, and Other Derivatives 9e: Solutions Manual* (ISBN: 978-0-133-45741-4).
2. **Lecture Notes:** Class lecture notes will be posted on Canvas.
3. **Handouts:** Problem sets and solutions will be distributed in class and/or posted on Canvas.

4. **Calculator:** You will need a calculator with the following functions: $\mathbf{y^x}$, **1/x**, $\mathbf{e^x}$, and **ln**. A good business calculator (or a cheap scientific calculator) will have these functions.

Options Software

The Hull book includes DerivaGem 3.00, which consists of two excel applications: the *Options Calculator* and the *Applications Builder*. We will use the *Options Calculator*.

Communication

The easiest way to get in contact with me is through email. I frequently check my email and will always respond to your email. If I haven't responded, that means, for whatever reason, I did not receive it. Please continue to email me until you get a response. If you can't email me, leave me a voice message.

I will contact you on your UNC Charlotte email address (@uncc.edu). If you respond to me with another email address, I will assume it is fine to respond back to you at that same email address. When I email the entire class, however, I will only use your UNC Charlotte email address.

Problem Sets

There will be four problem sets this semester. The purpose of these problem sets is to provide you with applications of the material covered in the course. The first problem set involves the design of futures contracts. The second problem set covers futures, futures pricing, and risk management strategies using futures contracts. The third problem set covers interest rate futures, swaps, and price restrictions on options. The fourth problem set covers option trading strategies, option pricing, and risk management strategies using options. These problem sets will count for 15 percent of your total course grade. The problem sets are due at the beginning of class on the date that they are due (see course outline). Any problem set handed in after that time will be considered late. You will lose 25% of the grade for a problem set for each day that it is late. ***You may work on problem sets in a group with no more than two (2) students. Each group will turn in only one problem set. You do not have to work with the same group for each problem set and you are not required to work in a group.***

Practice Questions

Lecture Note Questions: Each course lecture note has a set of questions with answers. These questions and answers will be posted on Canvas.

Practice Questions: Each chapter in Hull concludes with Practice Questions. Answers to the Practice Questions are in the *Solutions Manual*.

Exams

There will be three exams that will cover class lectures, class assignments, and class readings. You will be allowed to bring one 8.5" x 11" sheet of paper with notes and formulas

-- both sides are fine. The paper must be handwritten, not photocopied, and must be handed in along with the exam. Exams are scheduled well in advance so that you can plan around these dates. Please do not ask to be excused from exams for matters of personal convenience. An unexpected absence without supporting documentation will result in a grade of zero. The three exams will count for 25 percent, 25 percent and 35 percent of your total course grade, respectively.

Summary of Overall Grading

Item	% of Grade	Due Date
Problem Sets	15	
Problem Set 1		January 24
Problem Set 2		February 7
Problem Set 3		March 21
Problem Set 4		May 2
Exams		
Exam 1	25	February 14
Exam 2	25	March 28
Exam 3	35	May 9 (5:00-7:30 pm)

Grading Scale

The grading scale for the course is as follows:

Letter Grade	Wtd. Avg. %*
A	≥ 90
B	[78, 89]
C	[68, 77]
U	≤ 67

* Example: A student receiving 85%, 75%, 95%, and 100% on Problem Sets 1-4, and 94%, 75%, and 85% on Exams 1-3 would have an overall weighted-average percentage of (0.0375)(85) + (0.0375)(75) + (0.0375)(95) + (0.0375)(100) + (0.25)(94) + (0.25)(75) + (0.35)(85) = 85.31% and receive a letter grade of B.

Lectures

Lectures will stress the most important issues covered in the textbook. You are responsible for all material covered in class, assigned readings, problem sets, old test questions, etc. Lectures will go beyond the scope of the textbook for certain topics. Therefore, it is important that you attend class. **You are responsible for all announcements made in class.**

College and University Policies

Disability Services

If you have a disability that affects your ability to do the work in this course, please contact the Office of Disability Services to obtain a Letter of Accommodation and provide it to the instructor. The office is 230 Fretwell and the phone number is 704-687-4355.

Codes of Conduct

All students are required to read and abide by the UNC Charlotte Code of Student Academic Integrity and the UNC Charlotte Code of Student Responsibility (http://legal.uncc.edu/policies/up-407). Violations of the Codes will result in disciplinary action as provided in the Codes.

It is the student's responsibility to be fully and accurately informed of University policies, including, but not limited to, rules regarding dropping and adding classes, graduation requirements, and student conduct. The Dean of Students Office is the authoritative source for these policies.

Statement on Diversity

The Belk College of Business strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

Course Outline

Each class period includes readings from Hull and my lecture notes. Except for the exam dates, all dates in the course schedule are approximate and may change depending on our pace through the material.

Dates	Topic
Jan 10	Introduction to Derivative Securities • Hull, Chapters 1 and 2 • Lecture Note 1
Jan 17 and Jan 24	Pricing Forwards and Futures • Hull, Chapter 5 • Lecture Note 2
Jan 24	**Problem Set 1 Due (beginning of class)**
Jan 31 and Feb 7	Futures Hedging Strategies • Hull, Chapter 3 • Lecture Note 3
Feb 7	**Problem Set 2 Due (beginning of class)**
Feb 14	**Exam 1**
Feb 21	Interest Rate Futures • Hull, Chapter 6 • Lecture Note 4
Feb 28	Swaps • Hull, Chapter 7 • Lecture Note 5
Mar 6 – Mar 10	**Spring Break**
Mar 14 and Mar 21	Option Specifications, Price Restrictions, and Early Exercise of American Options • Hull, Chapters 10 and 11 • Lecture Note 6
Mar 21	**Problem Set 3 Due (beginning of class)**
Mar 28	**Exam 2**

April 4	Option Trading Strategies • Hull, Chapter 12 • Lecture Note 7
April 11	Binomial Trees and Risk Neutral Valuation • Hull, Chapter 13 • Lecture Note 8
April 18	Primer on Stochastic Calculus • Hull, Chapters 14 • Lecture Note 9
April 25 and May 2	Black-Scholes-Merton Model and Greeks • Hull Chapters 15 and 19 • Lecture Note 10
May 2	**Problem Set 4 Due (beginning of class)**
May 9	**Exam 3 (5:00-7:30 pm)**