

# BRANDEIS INTERNATIONAL BUSINESS SCHOOL

## FIN270a: Options and Derivatives Fall 2012

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**Class Hours:** Wednesday 6.30pm – 9.20pm;

**Office Hours:** By appointment

**Teaching Assistant:** TBA

### Course Description

The goal of the Options and Derivatives course is to introduce well prepared and motivated graduate-level students to a broad range of topics related to the financial derivatives markets and instruments, including pricing theory and applications, at a reasonably formal mathematical level. Our goal is to cover most of chapters 1-21 of Hull (8e) in one semester, which translates to almost two chapters per class. We will not maintain a steady pace, of course, as some of the materials are easily handled by student assigned readings and class discussion and review, while other topics will be developed in more detail in class. Examples of the former type are sections or chapters which introduce general market mechanics of derivative securities, while examples of the latter are chapters which provide quantitative tools for modeling, pricing and applying these securities in risk management and investment situations.

Students will be expected to develop a facility with the materials assigned in the readings in Hull. Class time will focus on developing and exploring the more subtle and quantitative topics, as well as clarifying ambiguities in the 'easier' readings concerning securities, market mechanics and conventions. Students can contribute materially to this latter class focus by identifying where these ambiguities exist.

It is expected that students will read each chapter in advance of the associated lectures.

### Prerequisites

FIN 201a or FIN 205a

## **Text**

John C. Hull, **Options, Futures, and Other Derivatives**, 8<sup>th</sup> ed. (Upper Saddle River, NJ: Prentice Hall, 2012, ISBN: 978-0-13-216494-8). The associated Student Solutions Manual is also recommended (ISBN: 0-13-216496-5), available May 2011. The 7<sup>th</sup> edition of Hull can also be used if currently owned, but the student will be responsible for assuring that the correct materials are studied, and correct homework exercises completed.

## **Class Sessions**

I strongly suggest that you read the assigned reading before the class discussion of the topic. In the class discussions I will usually cover the concepts and issues that are most challenging, reinforcing and extending what is in the required reading. I suggest that after the class session you review the assigned reading to solidify your understanding.

## **Learning Goals**

To develop an understanding of the contract designs and trading mechanics for a variety of financial derivatives defined relative to equity prices and indices, currencies, commodities, and interest rates. We will study forwards, futures, options, interest rate and currency swaps.

To learn how these derivatives can be used to leverage, hedge or otherwise change the risk profiles of investors or corporate managers in a host of real world settings. This study will include the development and application of various risk metrics such as duration, gamma, etc.

To understand the basics of financial derivatives pricing, and the relationship between “pricing” derivatives contracts and replicating derivatives contracts.

## **Course Materials Online**

This course will rely heavily on the LATTE platform – the web site will include downloadable files with the class handouts, copies of problem sets and suggested answers. You will need your UNet username and password to log on to the system at <http://latte.brandeis.edu>. You should check this site and your e-mail regularly for course announcements.

## **Course Requirements and Evaluation**

### **Examinations:**

There will be 2 midterm examinations (80 minutes) and a final examination (180 minutes), all closed-book. The midterms will be equally weighted and spaced approximately to divide the content into 3 equal parts. The final examination will be cumulative, reflecting the content covered in the midterms as well as content from the final third of the semester.

**There are no make-up midterm examinations.** See Grading Points below, but in general a student that misses a midterm, or performs poorly, can succeed in the course with a solid Final exam. Consequently, there is no advantage to missing a midterm examination even if not well prepared at that time.

**Homework:**

Advance readings will be assigned every class, and students are expected to be familiar with these readings before the associated lecture. Homework problems will be assigned every week and due at the beginning of the next class. The goal of these exercises will be to illuminate the material developed in class through numerical examples, and to facilitate students keeping pace with the lectures and preparing for the examinations. It is essential that students keep up with assignments and not rely on last minute preparation for examinations.

Homework exercises may be discussed in student groups generally, but each student is expected to submit their own work, and on time.

**Grading Points:**

The final numerical average for each student will be the larger of two calculations:

Midterm I:	20%	Midterm I:	0%
Midterm II:	20%	Midterm II:	0%
Final:	30%	Final:	70%
Homework:	25%	Homework:	25%
Class participation:	5%	Class participation:	5%

**Disabilities**

If you are a student with a documented disability on record at Brandeis University and wish to have a reasonable accommodation made for you in this class, please see me immediately.

**Academic Integrity**

You are expected to be familiar with and to follow the University's policies on academic integrity (see [http://www.brandeis.edu/global/current\\_academic\\_integrity.php](http://www.brandeis.edu/global/current_academic_integrity.php)). Instances of alleged dishonesty will be forwarded to the Office of Campus Life for possible referral to the Student Judicial System. Potential sanctions include failure in the course and suspension from the University.

## Planned Schedule

The course outline below lists the topics covered and the readings for each class. I have also listed the dates for the **Midterm Examinations** and **Final Examination**. Updates will be posted on LATTE.

	<b>Topic</b>	<b>Reading</b>	
September 5	Introduction Mechanics of Future Markets	Hull, Ch-1 Ch-2	
September 12	Futures and Interest Rates	Ch-3 Ch-4	
September 19	Forwards/Futures Prices Interest Rate Futures	Ch-5 Ch-6	
<b>September 26</b>	<b>Yom Kippur – No Class</b>		
October 3	Swaps	Ch-7	
October 10	Options	Ch-8 Ch-9	<b>Midterm examination</b>
October 17	Options (continued)	Ch-8 Ch-9	
October 24	Trading Strategies Involving Options	Ch-10	
October 31	Binomial & Wiener Process Ito's Lemma	Ch-11 Ch-12	
November 7	B-S-M Option Models	Ch-13	
November 14	Currency & Futures Options	Ch-14 Ch-15 Ch-16	<b>Midterm examination</b>
<b>November 21</b>	<b>Thanksgiving – No Class</b>		
November 28	Currency & Futures Options (continued)	Ch-14 Ch-15 Ch-16	
December 5	Greeks	Ch-17 Ch-18	
December 12	Value at Risk	Ch-20	
December 19	<b>Final examination</b>		