

University of Pennsylvania  
The Wharton School

Financial Derivatives  
FNCE 206/717  
Fall 2007

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### Motivation and Course Description

Derivatives markets have grown both in volume and in sophistication over the past 35 years. The 1970's have seen periods of high volatility following the collapse of the Bretton Woods system and the oil shocks, among other events. The derivatives markets grew in part because it enabled participants to reallocate risk to those most fit to bear it. The derivatives markets became more sophisticated as a result of important theoretical contributions, such as the Black-Scholes formula recognized by the 1997 Nobel Prize in Economics, and greatly improved computational capacities. Most recently, derivatives were arguable the top financial news topic with the backdating of executive stock options.

In order to participate in this modern finance environment, the course provides a description and an analysis of the basic types of derivative securities including forwards, futures, swaps, and options. The course is focused on pricing of derivatives and their use to hedge unwanted risks associated with movements in interest rates, exchange rates, stock prices, commodity prices, etc. At the conclusion of the course, the student should be able to price most types of derivatives and use them to construct hedging strategies.

### Class Times and Location

Section 401 from 10:30 to 11:50am  
Section 402 from 12 to 1:20pm  
Section 401 from 1:30 to 2:50pm  
All sections in Jon M. Huntsman Hall 360

### Course Materials

- Required
  - Hull, John, *Options, Futures, and Other Derivatives*, Sixth Edition, Prentice Hall, 2006.
  - *Harvard Business School Case #9-298-029*.
- Suggested
  - McDonald, Robert, *Derivatives Markets*, Second Edition, Addison Wesley, 2006.
  - Rubinstein, Mark, *Derivatives: A PowerPlus Picture Book*, available at [www.in-the-money.com](http://www.in-the-money.com).

All other materials, including lecture notes, will be posted on WebCafe.

## Tentative Outline

- Introduction
- Futures and Forwards
  - Institutions
  - Pricing
  - Hedging
- Swaps
- Options
  - Institutions
  - No-Arbitrage Relationships
  - Trading Strategies
  - Binomial Pricing
  - Models of Stock Returns
  - Black-Scholes Pricing
  - Beyond Black-Scholes
  - The Greeks
  - Corporate Hedging
  - Monte Carlo Pricing
- Risk Management
  - Value at Risk
  - Estimating Volatilities
  - Credit Risk
- Applications
  - Corporate Securities
  - Real Options

## Prerequisites

This elective course requires a core knowledge of finance. It also requires a working knowledge of algebra, calculus, and statistics, only because these instruments enable us to study derivative securities with the most clarity. The material covered in FNCE 100, STAT 101, and STAT 102 or FNCE 601 and STAT 621 satisfies the prerequisites of the course.

## Strategies for Learning More Efficiently

- Download the lecture templates available on WebCafe. Each lecture template will be posted prior to class. Note that, to encourage active participation, the posted lecture notes are incomplete.
- Complete your class notes by reading the sections of the textbook recommended on the lecture templates. Practice the problems recommended on the lecture templates. The solutions to those problems are provided in the solution manual accompanying the Hull textbook.
- Work in groups and learn from your classmates.
- Ask clarifying questions in a timely manner. Information about teaching assistants and their office hours will be announced in the second week of class.

## Evaluation

The evaluation consists of class participation, five homeworks, two mid-term exams, a final exam. Homeworks will be posted on WebCafe. For homeworks, you may work in a group of up to four students. Homeworks are due at the beginning of class; no late homework or electronic copy will be accepted. No make-up exam will be given, except with documented excuses consistent with university policy. There will not be class on the day of an exam. The exam locations are yet to be announced.

The final exam will be graded on a total of 200 points. Each mid-term exam will be graded on a total of 150 points. To give you flexibility, 75% of your better mid-term points and 25% of your worse mid-term points will count toward your final grade. Each homework will be graded on a total of 20 points. Class participation will count for a total of 50 points. No letter grades will be assigned for individual exams. A final letter grade will be awarded based on your total score out of 500 possible points.

In case you are not satisfied with your score on a homework or an exam, you will need to provide a written explanation on why you feel you deserve more points. Explanations should be precise and should pertain to the content of your homework or exam only. A reevaluation request for a particular question will entail a reevaluation of the entire homework or exam. As a result, your revised score may go up, stay the same, or move down relative to your initial score. Homeworks and exams originally written in pencil will not be regraded.

Please mark your calendar:

Homework #1	Wednesday September 19
Homework #2	Wednesday October 3
Review	Monday October 8
Mid-Term Exam #1	Wednesday October 10 from 6 to 8pm
Fall Break	Monday October 15
Homework #3	Wednesday October 24
Homework #4	Wednesday November 7
Review	Monday November 12
Mid-Term Exam #2	Wednesday November 14 from 6 to 8pm
Homework #5	Wednesday November 28
Review	Wednesday December 5
Final Exam	Tuesday December 18 from 6 to 8pm

## **Classroom Behavior**

Always bring your name card and display it on your desk. Turn your cell phone off or put it in silent mode. Use your laptop for note-taking only. Classroom behavior will be evaluated as part of the class participation grade. Moreover, violations of the University of Pennsylvania's *Code of Academic Integrity* ([www.vpul.upenn.edu/osl/acadint.html](http://www.vpul.upenn.edu/osl/acadint.html)) will be met with swift and certain punishment to the full extent of the regulation.