

Hong Kong University of Science & Technology

Derivative Securities (FINA 222, lecture 1A)

Fall 2005

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Office hours: Monday & Wednesday 15:30 – 17:30 or by appointment

Lectures: Monday & Wednesday 14:00–15:20 Rm4503

Course Website: <http://webct.ust.hk/>

Course Description

Derivative securities are used by individuals and by institutions to achieve a variety of purposes. This course provides an introduction to various basic derivative securities such as futures, swaps and options and the necessary skills to value and to employ them. The course is quantitatively oriented and requires some backgrounds in finance and statistics. The topics include valuation of options on common stocks, valuation of futures contracts on stock indices and commodities, trading and hedging strategies with respect to these derivatives. The celebrated Black-Scholes formula will be introduced and explained. The elegant binomial tree option pricing model will be introduced as a workhorse computational technique. If time permits, more sophisticated products such as credit derivatives and volatility swaps will be covered.

Course Text

John Hull, *Fundamentals of Futures and Options Markets*, 5th Edition, Prentice Hall

GRADING

Your final grade will be based on homework assignments and two exams. The relative weightings are as follows.

Homework assignments	20%
Midterm exam	35%
Final exam	45%

Note: The *final examination* will NOT be cumulative in that the portion covered in the *Midterm* will not be tested directly in the *final*. However, the second part of the course is slightly related to the concepts taught earlier.

Grades will be given based on the distribution suggested by University guidelines.

Course Requirements

1. Lectures participation:

Attendance is not mandatory but you are strongly recommended to attend all the lectures regularly. Students are encouraged to raise questions to the instructor and to participate actively in the class. Please do not allow problems to accumulate because it will be more difficult to solve them later. Active class participation helps you to think actively rather than passively and helps you to promote your performance in exams. Your class participation also provides us with feedback to gauge whether you understand the material.

2. Homework Assignment:

The homework assignments are to be done on a team basis with on more than three people in each group. Your team should stay together until the end of the term. Each team needs to submit only one write-up of each homework assignment, and all team members will receive the same grade for their work. Therefore it is important that all team members contribute equally to the homework assignments. If you feel that some team members do not contribute their fair share to the assignments you should talk to us. We will treat any complaints fully confidential.

Each homework assignment must contain a cover page that lists the group number, the names and student id numbers of the members of the group that contributed to the assignment. Only those students whose names appear on the cover page will receive credit for their homework assignment. All homework assignments should be written in an easily readable fashion. If your handwriting is difficult to decipher you may lose 5-10% of homework grade, depending on the severity of the problem.

Homework assignments have to be submitted before the start of class on the due date. For each day late you will incur a penalty of 20% of the maximum grade of the assignment.

- First Homework Assignment Due Date: Sept 21
- Second Homework Assignment Due Date: Oct. 10
- Third Homework Assignment Due Date: Nov.7
- Fourth Homework Assignment Due Date: Nov. 21

EXAMS

- Midterm: Oct. 17, 14:00-16:00pm in class
- Final: time and room to be announced

Absence from the exams will not be excused except for serious medical illness. A doctor's letter must be provided within one week of the exam. Any student caught cheating during the exams will receive zero credit and may face further disciplinary action.

Midterm Makeup

There will be **NO** makeup for midterm, even for legitimate absence. Instead, the final will count for 80%, rather than 45%. I strongly encourage you to take the midterm by any means. If you miss it, you only have one shot (the final exam).

COURSE OUTLINE

- Week 1: Introduction of Derivatives Markets, Chapters 1 and 2
- Week 2: Interest Rates, Chapter 4
- Week 3: Determination of Forward and Futures Prices, Chapter 5
- Week 4: Interest Rate Futures, Chapter 6
- Week 5: Swaps, Chapter 7
- Week 6: Hedging Strategies Using Futures, Chapter 3
- Week 7: Midterm, Chapter 1-7 (Oct. 17)
- Week 7: Properties of Options, Chapters 8
- Week 8: Properties of Options, Chapters 8 and 9
- Week 9: Trading Strategies and Binomial Trees, Chapter 10 and 11
- Week 10: Pricing of Stock Options, Chapter 12
- Week 11: Options on Stock Indices, Currencies, and Futures, Chapters 13 and 14
- Week 12: The Greeks, Chapters 15
- Week 13: Valuation using Binomial Trees, Chapter 16
- Week 14: Left-over materials, Review and Final Exam, Chapter 8-16