FINA 530: Advanced Derivatives Analysis
Spring 2008, HKUST

L3: Time: 9:00-12:20 Saturdays, April - June 7, 2008; Venue: Room # 4333

Instructor: Prof. K.C. John Wei, Ph.D.
Office: Room 2417
Phone: 2358-7676; Fax: 2358-1749; Email: johnwei@ust.hk
Office Hours: by appointment
Course Website: All relevant materials and announcements will be uploaded to LMES website (http://lmes2.ust.hk/portal)

Teaching Assistant: Mr. Eric Lam (email: efylam@ust.hk)
Office hours: by appointment

Prerequisites
FINA529

Required Textbook
John C. Hull, *Options, Futures, & Other Derivatives*, Sixth edition, Prentice-Hall, 2006.

Students are urged to read chapters before each class. Further readings will be assigned from time to time. Students are also urged to learn a spreadsheet program such as Microsoft Excel.

Course Objectives
This course will cover advanced techniques in option pricing and derivatives risk management. The primary objective of the course is to understand the pricing theories and the use of options in risk management. Topics include the binomial model, risk-neutral valuation, extension of the Black-Scholes pricing model and option Greeks. The course will also include discussion and analysis of options on futures and some popular OTC products such as equity linked notes and principal guaranteed funds. Though this course does not require sophisticated skills, the materials do tend to be somewhat rigorous.

Evaluation

	Category	Weight
1.	Two Homework Assignments	20%
2.	One Case Study (presentation and written report)	20%
4.	Final Exam	60%
5.	Participation (bonus may be given for margin cases)	
	Total	100%

The time and venue for the final exam will be announced later. Any conflicts with other final exams must be reported immediately.

Assignments: General
There will be two homework assignments, and one case. Groups of no more than four members are allowed for all assignments. Each member of the group will receive the same grade. Due to the threat of viruses, email submissions of assignments are not allowed. But you can use fax to submit the assignments, if it is necessary. Late hand-in assignments will be subject to penalty. The penalty for homework assignments for each passing day is 10 points (with a full mark of 100 points). Once the solutions for homework assignments are provided, a zero score will be assigned. For the case, no late hand-in is allowed. Participation and attendance are highly encouraged. Students with borderline

cases with very active participation may be upgraded to the next higher letter grade.

Homework Assignments and Final Exam
The homework assignments are designed to help you prepare your final exam. Final may be consisted of (1) calculation questions related to homework assignments, (2) non-calculation essay questions, and (3) multiple-choice questions.

Description of Case
The case is related to an application to option pricing. The grade will be consisted of (1) the approach or the logic you use to price the option is reasonable, (2) the quality of your case written (which is independent of whether or not the answer or the approach is in the right direction), (3) the quality of presentation. The written report for case needs to be handed in right after the discussions. The page format: single space, Times New Roman with font 12, and a margin of one inch on each side. Please attach all you calculations from your spreadsheets in an appendix.

Comments and suggestions: I would like you to enjoy the class as much as possible. If you have any comments and suggestions that can improve the quality of the class and your enjoyment, please feel free to let me know.

Schedule (Tentative and is subject to changes)

Week 1: April 19, 2008
- Topic 0: Review on Options Basics
- Topic 1: Binomial Option Pricing Model (Chapters 11 and 14)

◊ Case is given

Week 2: April 26, 2008
- Topic 1: Binomial Option Pricing Model (Chapters 11 and 14)
- Topic 2: Wiener Processes and Itô's Lemma (Chapter 12)

◊ Homework Assignment #1 is given

Week 3: May 3, 2008
- Topic 3: The Black-Scholes Option Pricing Model (Chapters 13-14)

◊ Supplemental readings:
  - Fisher Black, 1989, "How do we come up with the option formula," *Journal of Portfolio Management* 15.
  - Robert C. Merton, 1998, "Applications of option-pricing theory: twenty-five years later," *American Economic Review* 88, 323-334.
  - Myron Scholes, 1998, "Derivatives in a dynamic environment," *American Economic Review* 88, 350-370.

Week 4: May 10, 2008
- Topic 4: Dynamic Hedging Strategies
- Topic 5: Option applications: CGF and ELN

◊ Homework Assignment #1 is due

◊ Homework Assignment #2 is given

◊ Supplemental reading: Leland O'Brien Rubinstein Associates Incorporated: Portfolio Insurance

Week 5: May 17, 2008
- Topic 5: Option applications: CGF and ELN
- Topic 6: Risk Parameters for Options (Chapter 15)

◊ Case presentation

◊ Case is due

Week 6: May 24, 2008
- Topic 6: Risk Parameters for Options (Chapter 15)
- Topic 7: Volatility Smile and Volatility Estimation (Chapters 16 and 19)

Week 7: May 31, 2008
- Topic 7: Volatility Smile and Volatility Estimation (Chapters 16 and 19)
- Review

◊ Homework Assignment #2 is due

Week 8: June 7, 2008

◊ **Final Exam**

◊ **3 pages of cheat sheets of formulas-only are allowed (no numbers, no words, no workout procedures, etc.).**

◊ Time: 9:00 – 12:00

◊ Venue: at HKUST campus (Room # 4333)

◊ Enjoy the course