SAMPL E SYLLABUS - SUBJECT TO REVISION

Course Description for B40.3335.20: Spring 2010

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1 Class Times and Room

The class meets from 9:00-10:20am on Mondays and Wednesdays in K-MEC Room 3-65.

2 Course Description & Prerequisites

Derivative securities—securities whose payoffs are derived from the values of more fundamental underlying variables—have become ubiquitous in today's financial world. This course is an introduction to this field, and focusses on three particular classes of these securities: futures, forwards, and options. The objective is to understand (a) the role that can be played by derivative securities in the management of risk, and (b) the general principles underlying the valuation and hedging of derivative securities. A more detailed list of topics may be found below.

The course is essentially self-contained. No background knowledge of derivative securities is presumed.

3 Textbook and Slides

The textbook for the course is my own book:

- Rangarajan K. Sundaram and Sanjiv R. Das, *Derivatives: Principles and Practice*, McGraw-Hill, 2010.

The book will be published only in February 2010, but the publishers have told me that they will make available through the bookstore a paperback "pre-publication" version. The chapters in the book elaborate on the material covered in the class presentations.

Copies of the presentation slides used in class each week will be posted on the Blackboard site for the course at least one week before class. The slides will be posted under "Course Documents," and will be pdf files. You will need Adobe Acrobat Reader to view and print them. Adobe Acrobat Reader is free software and may be downloaded from http://www.adobe.com.

Other Books

There are several other books on derivatives you may wish to consult. A partial list of the available text books includes:

- Donald Chance, *An Introduction to Derivatives*, Dryden.
- David Dubofsky and Robert Miller, *Derivatives: Valuation & Risk Management*, Oxford University Press.
- John Hull, *Futures, Options, and Other Derivatives*, Prentice-Hall.
- John Hull, *An Introduction to Futures and Options Markets*, Prentice-Hall.
- Robert Jarrow and Stuart Turnbull, *Derivative Securities*, South-Western.
- Robert McDonald, *Derivative Markets*, Addison-Wesley.
- Rene Stultz, *Risk-Management and Derivatives*.

For the segment of the course dealing with futures, an excellent reference is Darrell Duffie's *Futures Markets* (Prentice Hall); unfortunately, I believe this book is now out of print. For the part dealing with options, *Financial Options* (Irwin) edited by S. Figlewski, W. Silber, and M.G. Subrahmanyam; *Options Markets* by J. Cox and M. Rubinstein (Prentice–Hall); and *Option Pricing* by R. Jarrow and A. Rudd (Irwin), are all recommended as additional reading.

4 Examinations and Grading

Grades for the course will be based on two in-term examinations and a final examination. The *better* of the two in-term exams will be taken towards 40% of the course grade, with the final accounting for the remaining 60%. The exam dates are as follows:

1. The first in-term examination will be held on Wednesday, February 24, 2010, from 9:00-10:20am. The exam will include all material covered upto and including Monday, February 22, 2010.
2. The second in-term examination will be held on Monday, April 5, 2010, from 9:00-10:20am. The exam will focus on the options material covered up to this point (i.e., the material covered between February 8 and March 31, both dates inclusive.

3. The final exam will be on Monday, May 10, 2010, from 9:00-11:00am in Room 3-65. The final is cumulative, and includes all material covered during the entire course.

5 Office Hours & Contact Information

My office hours during Spring 2010 are 1:30-3:00pm on Mondays and Wednesdays. Except where conflicts with classes and seminars arise, I am also available at other times by appointment.

My office is located at Room 9-92 K-MEC. My office telephone number is 998-0308. I can also be reached via e-mail at rsundara@stern.nyu.edu. My assistant, Ms. Hakema Zamdin, can be reached at 998-0301.

6 Problem Sets

Problem Sets and answer keys for each week's material will also be posted on the course Blackboard website. The problem sets are meant for practice and to test understanding of the course material. It is strongly recommended that students attempt to solve the problems without first consulting the answer key.

7 Tentative Course Schedule

The *tentative* schedule of topics by class is given below. We will attempt to adhere to this schedule as much as possible, but the actual classes may speed up or slow down depending on how comfortable everyone is with the pace of lectures.

The chapter numbers referred to below are the chapters from my book. As mentioned earlier, these chapters will be posted on the course website, as also will the overheads used in class.

Week 1: January 25 & 27, 2010 Overview & Futures Markets.

- Reading: Chapters 1 (Introduction) and 2 (Futures Markets).

Week 2: February 1 & 3, 2010 Pricing Forwards & Futures.

- Reading: Chapter 3 (Pricing Futures & Forwards I: The Basic Theory). Skim through Chapter 4 (Pricing Forwards & Futures II: Building on the Foundations).

Week 3: February 8 & 10, 2010 Introduction to Options

- Chapters 7 (Options Markets) and 8 (Options: Payoffs and Trading Strategies).

Week 4: February 17, 2010 No-Arbitrage Restrictions.

- Reading: Chapter 9 (No-Arbitrage Restrictions on Option Prices).

Note: There is no class on Monday, February 15, 2010.

Week 5: February 22 & 24, 2010 Early Exercise and Put-Call Parity; First in-term examination.

- Reading: Chapter 10 (Early-Exercise and Put-Call Parity).

The 1st in-term examination is on Wednesday, February 24.

Week 6: March 1 & 3, 2010 Introduction to Option Pricing

- Reading: Chapter 11 (Option Pricing: An Introduction).

Week 7: March 8 &10, 2010 Binomial Option Pricing and Implementation.

- Readings: Chapter 12 (Binomial Option Pricing) and Chapter 13 (Implementing the Binomial Model).

Week 8: March 22 & 24, 2010 The Black-Scholes Model.

- Reading: Chapter 14 (The Black-Scholes Model). For more mathematical detail, see Chapter 15 (The Mathematics Behind Black-Scholes).

Week 9: March 29 & 31, 2010 The Option Greeks.

- Chapter 17 (Sensitivity Analysis: The Option "Greeks").

Week 10: April 5 & 7, 2010 2nd In-Term Examination + Exotic Options I.

- Reading: Chapter 18 (Exotic Options I: Path-Independent Options).

The 2nd in-term examination is on Monday, April 5.

Week 11: April 12 & 14, 2010 Exotic Options II & Credit Derivatives I

- Readings: Chapters 19 (Exotic Options II: Path-Dependent Options) and 31, pp. 771-782 (Credit Derivative Products).

Week 12: April 19 & 21, 2010 Credit-Derivatives II

- Readings: Chapter 31, pp. 783-803.

Week 13: April 26 & 28, 2010 Structural Credit Risk Models.

- Chapter 32 (Structural Models of Default Risk).

Week 14: May 3, 2010 Reduced-Form Credit Risk Models.

- Chapter 33 (Reduced-Form Models of Default Risk).