

Brunel University
MSc., Derivative Securities
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READING LIST & LECTURE SCHEDULE

Aim (Broad Educational Purpose)

(i) To describe the theory and practice of financial engineering. Throughout this module we will show how to use financial theory to solve practical problems and also to illuminate the institutional material that students of financial engineering must absorb.

(ii) To enumerate and describe the various securities and markets in a clear and concise manner that accurately blends theory and practice.

Objectives (Specific Learning Outcomes)

On successful completion, students should be familiar with the options on stocks, the definitions of the call option, the put option, and the long and short positions on options, the properties of the options, the factors affecting option prices and the concept of the put-call parity.

thoroughly understand the binomial option pricing model (BOPM) which is one of the two most widely used models for determining the equilibrium option price.

be able to create trading strategies involving options (the bull, the bear and the butterfly spreads; the straddles, the strips, the straps and the strangles)

be familiar with the Black-Scholes option pricing model

be familiar with the definitions of the spot interest rate, the yield-to-maturity and the forward rate, the basic relationships of the term structure of interest rates

be familiar with the concepts of the duration and the definitions of the reinvestment risk and the market risk.

thoroughly understand the forward and futures contracts

be familiar with the Asian and other options

Extra

be able to measure the option's price sensitivity to changes in the factors that determine the value of an option: the 'Greeks'.

be familiar with the expectations hypothesis of the term structure, the liquidity-preference theory of the term structure

thoroughly understand the mathematics of continuous time finance.

be familiar with the continuous and discrete time series models of the short term interest rates.

Teaching Arrangements

Throughout the term 1, there will be a weekly lecture combined with a one hour class which is compulsory. During each lecture students will be given a set of lecture notes (and a problem set).

Course Assessment

There will be a compulsory test which will count 30% towards the course unit mark. In May, students will sit a three hour formal examination which will count for 70% of the course unit mark.

In the following reading list: * denotes the most essential reading below.

Required Reading

H: J. C. Hull, Options, Futures and other Derivative Securities, Seventh Edition, Prentice Hall, 2008.

Essential Reading

H1: J. C. Hull, Introduction to Futures and Options Markets, Third Edition, Prentice Hall, 1998.

JG: R. S. Johnson and C. Giaccoto, Options and Futures, West, 1995.

BM: R. Brealey, S. Myers and F. Allen, Principles of Corporate Finance, Ninth Edition, McGraw Hill, 2008.

CR: J. C. Cox and M. Rubinstein, Option Markets, First Edition, Prentice Hall, 1985.

T: R.G. Tomkins, Option Analysis, Macmillan, 1994.

A: F.D. Arditti, Derivatives, Harvard Business School Press, 1996.

Module Outline

1. Option Concepts.

[H*: Chapters 1 and 7. BM*: Chapter 20. JG: Chapters 1 and 4. CR:

Chapters 2 and 4. Lecture Notes.]

2. Trading Strategies involving Options.

[H*: Chapter 8. JG: Chapter 3. BM: Chapter 20. CR: Chapter 1. Lecture Notes.]

3. Binomial Option Pricing Model.

[JG*: Chapter 5. BM: Chapter 20. CR: Chapter 5. Lecture Notes.]

4. Black-Scholes Option Pricing Model.

[H*: Chapter 10. CR: Chapters 5 and 6. Lecture Notes.]

5. Expectation hypothesis/Duration of Bonds.

[Lecture Notes*. BM*: Chapter 24.]

6. Forward and Future contracts.

[H*: Chapters 1 and 3. Lecture Notes.]

7 Asian and Other Options

[Lecture Notes*]

EXTRA

The 'Greeks'.

[H*: Chapter 13. Lecture Notes.]

The Mathematics of Continuous Time Finance.

[H*: Chapters 9 and 10. Lecture notes*]

Time Series Models for the Short Term Interest Rates.

[Lecture Notes*]

The Term Structure of Interest Rates.

[Lecture Notes*. BM*: Chapter 24.]