

Concordia University
The John Molson School of Business
Department of Finance

Finance 412 –Options and Futures

Course Outline – Summer 2013

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Office Hours: Wed. 18-19 (or by appointment)
Lectures: Mon. /Wed. 15-17:30
Classroom: MB 3.435

OBJECTIVES

This course is an introduction to the analysis and valuation of derivative securities such as futures contracts and options. It covers the description of these instruments and of the markets in which they trade, the use of the instruments in hedging and in speculative strategies, and the main models for their valuation. Emphasis will be placed on the end-use of the instruments, as well as on the theoretical models for their pricing. The underlying assets will be mainly commodities and stock indexes for futures, and stocks and stock indexes for options. The purpose of the course is to help students understand the appropriate theories and techniques, and to train them to use derivatives in managing risk and exploiting private information.

The analytical content of the course is *quite heavy*, although an effort will be made to lighten it as far as possible. The course content is sometimes known as *financial engineering*, and the mathematical prerequisites are somewhat similar to those of engineering and applied science. Students are supposed to be thoroughly familiar with the normal and log-normal distributions, as well as with basic calculus. Several concepts from earlier finance courses, like those of *duration*, of *forward rates*, of the *beta* of a security, and of the market model of security returns, will be used in some parts of this course. They will be assumed known. Students who have problems with these concepts are urged to refresh their knowledge of these topics prior to taking this course.

The course also uses some elementary concepts of *continuous-time finance*. These have already been presented in earlier courses, but have not been used extensively. Thus, most compounding and discounting is done in continuous time in this course. Similarly, bond pricing, the term structure of interest rates and bond duration will now be reformulated in continuous time. Students should review their notes for anything that has to do with these concepts.

TEACHING MATERIAL

Required:

J. Hull: Options, Futures, and other Derivatives, eighth edition, Prentice-Hall, (H).

Recommended:

Z. Bodie, A. Kane, A. Marcus, S. Perrakis, and P. Ryan: INVESTMENTS, seventh Canadian Edition, McGraw-Hill Ryerson Ltd.

METHODOLOGY AND EVALUATION

The course will consist of lectures according to the outline below, as well as problems, and class discussion. Students are expected to attend lectures, participate in the class, hand over the assignments, and write the exams.

Students are expected to work on the problems indicated in the outline below, as well as on those handed in during the lectures. The solutions to the problems will be posted to the FirstClass course folder.

Most of the lectures are on PDF files under the course title, posted on FirstClass. The lecture notes contain most of the material that will be presented in class. Some additional material will also be presented in class, for which the students should take notes.

There will be a midterm and a final exam. There will also be two assignments, one before and one after the midterm. Students have the choice of doing the assignments individually or in groups of 2 people. For the midterm and the final the students may use a cheat sheet of notes and formulas, with up to two and four pages, respectively.

Midterm exam	40%
Assignments	15%
Final exam	45%

Minimum of 40% on the final exam is required to pass the course. The midterm exam would be held on the seventh week of the class.

COURSE OUTLINE

The class sessions are of 2.5 hours each. The outline below may be modified if necessary, especially as to the readings and the problems.

Part 1 (Class 1) INTRODUCTION

- A. Futures and forwards: description and markets
- B. Options: Description and markets

Read: H ch. 2 (pp. 22-37 and pp. 41-42), ch. 9 (pp. 194-199)

Problems: H ch.2: # 11, 12, 15, 16, 23, 25. H ch.9: # 9, 10, 13

Part 2 (Class 2) FORWARD AND FUTURES PRICING

- A. Forward pricing
- B. The spot-futures parity theorem
- C. Commodity futures pricing
- D. The interest parity theorem

Read: H ch.5 (pp. 101-120)

Problems: H, ch.5: # 9, 10, 11, 12, 14, 15.

Part 3 (Class 3 and 4) HEDGING WITH FUTURES

- A. Hedging with commodity futures
- B. Hedging stock portfolios
- C. Interest rate futures

Read: H ch.3 (pp. 47-65), ch.6 (pp. 129-139)

Problems: H ch.3: # 12, 16, 18, 21. H ch.6: # 17, 18.

Part 4 (Class 5) PROPERTIES OF STOCK OPTIONS

- A. The arbitrage principle
- B. Call and put price bounds
- C. Put-call parity

Read: H ch.10

Problems: H ch.10: # 3, 4, 6, 11, 16, 17.

Part 5 (Class 6) OPTION STRATEGIES

- A. Analyzing option strategies

Read: H ch.11 (pp. 236-249)

Problems: H ch.11: # 3, 6, 7, 13, 17.

Class 7 MIDTERM EXAM

Part 6 (Class 8 and 9) THE BINOMIAL MODEL OF OPTION PRICING

- A. One-period option valuation
- B. The binomial model in many periods
- C. Application to the valuation of American options

Read: H ch. 12

Problems: H ch.12: # 1, 4, 5, 9, 10, 11, 12, 14.

Part 7 (Class 10 and 11 and 12) THE BLACK-SCHOLES MODEL AND ITS APPLICATIONS

- A. Lognormal property
- B. The Black-Scholes model
- C. Implied volatility
- D. The Greeks
- E. Options on Indices, Currencies and Futures

Read: H ch.14 (pp. 299-320), ch.16 (pp. 350-356), ch.17 (pp. 361-365 and pp. 367-371)

Problems: H ch.14: # 4, 6, 7, 11, 13, 16. H ch.16: # 7, 10, 13, 18. H ch.17: # 4, 7, 8, 9, 14, 16, 20.

Class 13 GENERAL REVIEW

Letter & Numerical Grades:

Grade Breakpoint	Grade
0%	FNS
50%	D-
54%	D
58%	D+
60%	C-
64%	C
68%	C+
70%	B-
74%	B
78%	B+
80%	A-
85%	A
90%	A+

Academic Integrity:

The Code of Conduct (Academic) at Concordia University states that the “integrity of University academic life and of the degrees, diplomas and certificates the University confers is dependent upon the honesty and soundness of the instructor-student learning relationship and, in particular, that of the evaluation process. As such, all students are expected to be honest in all of their academic endeavours and relationships with the University.” [Undergraduate Calendar, section 16.3.14 or Graduate Calendar, Code of Conduct (Academic).]

- *All students enrolled at Concordia are expected to familiarize themselves with the contents of this Code. You are strongly encouraged to visit the following web address: <http://johnmolson.concordia.ca/ugrad/codeofconduct.pdf>, which provides useful information about proper academic conduct.*
- *Student Advocate Program has produced a short video presentation on academic misconduct as well as pamphlets in four languages: English, French, Chinese and Arabic. These are available to students at: <http://supportservices.concordia.ca/studentadvocateprogram>.*