Ronald T. Slivka, Ph.D.
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Department of Finance & Risk Engineering

NYU Tandon School of Engineering
Department of Finance and Risk Engineering
Course Outline FRE-GY 6291 Applied Derivative Contracts
Adjunct Professor Ronald T. Slivka, Ph.D.
Tuesdays, at assigned times and classroom locations

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Office hours: At classroom location one hour prior to the start of any class or by appointment. Available otherwise by phone / email

Course Pre-requisites
Prerequisite: Graduate Standing

Course Description
This course provides an introduction to derivative contracts with a special emphasis on current practical applications in use today by financial institutions for investing, hedging, trading and issuing. The characteristics and features of futures, forwards, swaps, options and structured notes are all covered with a special emphasis on useful applications likely to be encountered in employment interviews. For each of the four primary derivative contracts, we review in these lectures the appropriate definitions, terminology, market mechanics and theoretical fair value pricing. Typical employment interview questions will also be discussed as they related to lecture material.

Course Objectives
Students should expect to achieve a detailed understanding of the following
- Accurate definitions for each of the four fundamental contracts of the derivatives world
- Clear understanding of the terminology specific to each contract
- Knowledge of how contracts are traded in their respective markets
- How to derive and compute the theoretical fair values for each of the fundamental contracts
- Practical examples of how derivatives are applied to solve business and investing problems
- An intuitive understanding of derivative behavior to complement analytical understanding

Course Structure
In the first three lectures we focus on futures and forward contracts reviewing definitions, markets, users and uses. The terminology, mechanics and pricing of futures and forward markets are covered in detail with a focus on equity, debt and interest rate instruments.

In the next three lectures the details of swaps and options are addressed. The capital market interpretation of swaps is explored along with the means of determining the value and pricing for these important derivatives. Option basics and simple option valuation approaches are explained and applications are emphasized. The uses of swaps and options for investing, hedging, issuing and trading are all examined. Assignments will employ both typical interview questions and end of chapter problems.

A Final Exam will be administered on the seventh lecture date

Readings
Available in the NYU bookstore

For all lectures, some material supplementary to the text will be assigned for reading. Students will be expected to complete readings and some online educational exercises available from selected derivative websites.
Course requirements
Throughout the course students will be expected to participate actively. Separate optional learning opportunities with more challenging exercises are offered for students who already have a more advanced understanding of derivative topics.

Selected End of Chapter problems will be assigned along with typical employment interview questions for discussion in class. End of Chapter problems with odd (even) numbered problems for odd (even) numbered chapters are suggested but not mandatory. Completion of these problem sets, however, is strongly encouraged to secure a full learning experience. Answers will be made available from a Solutions Manual with additional assistance available from a Teaching Assistant.

Typically one special exercise will be assigned for completion each week. While these special exercises will not be formally graded they will be examined carefully for mistakes with analysis and comments returned to each student. It is mandatory for all students to return these particular assignments. Failure to do so will count against a final grade.

A Final Exam will be administered on the seventh lecture date
This exam will be open book, open notes. You must bring a calculator. No devices that permit texting, emailing or internet connections will be allowed. The exam typically has five problems covering major segments of the lecture content.

Grading
- 55% will be based on the Final Exam
- 20% will be based on class participation and completed assigned exercises
- 25% will be based on completion of end of chapter problems and quizzes

Seven Lectures
Course Days, Times and locations are assigned by the Business Office.
Course Location: NYU Poly Campus at Metrotech Center
Students should verify the exact times and locations vary each semester.

1 Overview of Derivative Instruments
An introduction to basic derivative instruments and definitions is provided. The history of the markets is described along with the primary users, uses, benefits and concerns.
Reading: Hull Chapter 1 + extra assigned readings
Homework: Ch 1 End of Chapter problem plus Employment Interview Questions

Futures Markets
The definition of a futures contract is specified and important terminology is provided. Quotation conventions are explained and market mechanics are reviewed.
Reading: Hull Chapters 2, 3 + extra assigned readings
Homework: Selected Ch 2 and 3 End of Chapter Problems + special assigned exercise + Interview Questions

2 Equity Futures
Equity futures are explored in substantial depth with an examination of the underlying equity references and specific market practices. Pricing formulas for these instruments are derived and applied. Numerous practical applications are provided.
Reading: Hull Chapter 5 + extra assigned readings
Homework: Selected Ch 5 End of Chapter Problem + special assigned exercise + Interview Questions
3 Interest Rate Futures
Eurodollar futures contracts are covered in detail using the same methodical approach applied with both equity and debt futures. The fair value of these futures is derived with an arbitrage argument. Forward rates are explained and the hedging of assets and liabilities are covered.
Reading: Hull Chapters 4, 6 + extra assigned readings
Homework: Selected Ch 4 and 6 End of Chapter Problems + special assigned exercise + Interview Questions

Forwards and FRAs
The mechanics of forward contracts are explored. The internal architecture of forward rate agreements (FRAs) is outlined and the fair value of these contracts is once again derived with an arbitrage argument common to all derivatives. The relationship to Eurodollar futures is explained and the hedging of assets and liabilities are covered.

Reading: Hull Chapter 4 + extra assigned readings
Homework: Selected Ch 4 End of Chapter Problems + special assigned exercise + Interview Questions

4 Introduction to Swaps
The definitions of equity, interest rate and currency swaps are developed. Relevant terminology is reviewed along with the swap mechanics of quotation and trading. The internal cash flows for a vanilla swap are studied in detail.
Reading: Hull Chapter 5 + extra assigned readings
Homework: Selected Ch 5 End of Chapter Problems + special assigned exercise + Interview Questions

5 Swap Pricing
The composition of cash flows for a vanilla swap and the methodology for both swap valuation and swap pricing are treated in substantial detail to illustrate general pricing principles and valuation procedures. The interpretations of swaps as either a pair of bonds or as a strip of forwards is explained.

Swap Applications and Non-Vanilla Swaps
The application of swaps to hedging both assets and liabilities is reviewed with specific examples. The use of vanilla swaps to construct non-vanilla swaps is explored in detail.
Reading: Hull Chapter 6 + extra assigned readings
Homework: Selected Ch 6 End of Chapter Problems + special assigned exercise + Interview Questions

Option Basics
Exchange-traded and OTC options are compared. Important definitions, quotation conventions, market mechanics, and regulations are explained.

Reading: Hull Chapters 10, 11, 12 + extra assigned readings
Homework: Selected Ch 10--12 End of Chapter Problems + special assigned exercise + Interview Questions

6 Option Pricing
Factors affecting stock option prices are reviewed. Three models of option pricing are explained with examples. An introduction to the valuation of options using binomial trees is developed. One and two-step trees are applied to puts and American calls. Put-Call parity is explained. The derivation and use of “Greeks” is reviewed.
Reading: Hull Chapter 13 + extra assigned readings
Homework: Selected Ch 13 End of Chapter Problem + special assigned exercise + Interview Questions

Option Applications
Strategies involving the use of single options are examined. The payoffs from spreads and combination trades are derived. Numerous applications to investing, hedging, trading and issuing are covered.
Reading: Hull Chapters 17, 19 + extra assigned readings
Homework: Selected Ch 17, 19 End of Chapter Problems + special assigned exercise + Interview Questions

7 Final Exam
This exam will be open book, open notes. You must bring a calculator. By University Policy “The use of cellphones, cameras, texting, emailing or any other communication with any other person (either in the exam room or not) during an exam or when reviewing the graded work at a future time is cheating. Anyone seen touching or looking at a cellphone during these times will be given a grade of zero for the exam.”

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Ronald T. Slivka, Ph.D. is an Adjunct Professor at the Polytechnic Institute of New York University and a faculty member of the New York Institute of Finance. With over 35 years of practical Wall Street experience, Dr. Slivka has held equity derivative sales and management positions at Salomon Brothers, J.P. Morgan and ABN AMRO. He has written over 40 articles and book chapters on a broad range of derivative topics and holds a Ph.D. in Physics from the University of Pennsylvania. Ron presently serves on the Editorial Board of the Indian Journal of Finance and reviews for the International Journal of Emerging Markets and Journals of Investing and Index Investing (RTslivka@msn.com).

LinkedIn at http://www.linkedin.com/pub/ronald-t-slivka/21/275/316
Access my recent papers on SSRN at: http://ssrn.com/author=1530815

Moses Center Statement of Disability

If you are student with a disability who is requesting accommodations, please contact New York University’s Moses Center for Students with Disabilities at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd floor.

University Grade Change Policy - 3 July 2013

"Grades on file with the Registrar at the end of the semester, with the exception of incomplete (I) and temporary grades (S or U), are considered final unless an error in calculating or recording the grade is discovered. No correctly reported final grade may be changed based upon re-taking an examination or completion of additional work. Incomplete (I) grades are handled according to the policies described under Incomplete Grades. Temporary grades (S or U), used for continuing projects, thesis or dissertation, will be converted to standard letter grades upon completion of the project, thesis or dissertation. Once recorded with the Registrar, these grades are treated as all other final grades. If an error in calculating or reporting a grade is discovered, the instructor will submit the change of grade request to the Department Head. Upon approval of the Department Head, the request will be submitted to the appropriate Associate Provost for approval. Any incorrectly assigned grade must be corrected within one semester."

Iraj Kalkhoran
Walter Zurawsky