

NEW YORK UNIVERSITY STERN SCHOOL OF BUSINESS

Debt Instruments

Syllabus for C15.0026.01, Summer 2009

Instructor Farhang Farazmand

Office hours: T/Th 1:00-2:00 or by appointment

Meeting location: T-LC21 3PM-5:55PM

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Course Description

The goals of this course are to describe important fixed income securities and markets, and develop tools for valuing fixed income securities and managing interest rate risk. The course covers traditional bonds and term structure concepts as well as fixed income derivatives and interest rate modeling.

- Introduce important fixed income securities such as bonds, forward rate agreements, futures, swaps, interest rate options (Caps, Floors, and Swaptions)
- Develop tools for pricing and hedging the fixed income securities
- Discuss tools for managing interest rate risk
- Introduce term structure models
- Each week students have one or two assignments to hand in.
- There is one 1.5 hour midterm and one 3 hours final exam. Both are in class.

Warning

The study of fixed income securities is quantitative by nature and the material in this course is very technical. Students should have a background in basic finance and should be comfortable using math and working with numbers. Please keep this in mind in deciding whether to take the course.

Required Reading:

- Lecture slides and problem sets
- Lecture slides will be posted on Blackboard

Recommended Reading:

- Bruce Tuckman, *Fixed Income Securities*, Wiley, 2002, 2nd ed.
- John Hull, *Futures, Options, and Other Derivatives*, Prentice-Hall, 6th edition, 2005.
- Robert Jarrow, *Modelling Fixed Income Securities and Interest Rate Options*, 2nd Edition, 2002.

Grading:

- Problem sets: 20%
- Midterm: 30%
- Final Exam: 40%
- Class Participation/Attendance: 10%

Problem Sets

Because the material is analytical and new concepts build on old ones, it will be essential to do the problem sets in order to follow the lectures and succeed on the exams. To facilitate learning, I encourage students to work together on these problem sets. However, I require the students to submit individual answers. I will not accept late assignments.

Exams

Please bring a financial calculator, one 8.5x11 inch page of notes (both sides) for the midterm, and two 8.5x11 inch pages of notes for the final.

Topics Covered in Class*Topic I: Introduction & Valuation of Fixed Cash Flows*

A brief course overview and review of basic valuation. This part of the course covers the valuation of fixed cash flows, no arbitrage valuation, and important concepts such as yield-to-maturity.

Topic II: The Interest Rate Sensitivity of Instruments with Fixed Cash Flows

This part of the course covers the interest rate sensitivity of fixed cash flows, including the important concepts of duration and convexity, and how these concepts apply to a portfolio of securities. These tools are then used to show how to hedge the interest rate risk of securities with fixed cash flows.

Topic III: Introduction to Variable Cash Flows

These lectures provide an introduction to markets with variable cash flows. As a starting point, we discuss the valuation and interest rate sensitivity of floating rate notes and inverse floaters. We also cover one of the more important securities in the fixed income market, the interest rate swap.

Midterm

Topic IV: Valuation and Interest Rate Sensitivity of Interest-Rate Dependent Cash Flows

This part of the course covers the techniques for valuing cash flows which depend on interest rates. The lectures will include a description of the major characteristics of interest rates.

Topic V: Fixed-Income Options

These lectures will focus on the valuation of fixed-income options, and embedded options in fixed-income securities. As options are a building block for many securities, these lectures are crucial for the understanding of later concepts.

Topic VI: Fixed-Income Options - Applications

This part of the course covers important applications of interest rate options, in particular, common embedded options in the fixed-income market such as (i) callable bonds, (ii) caps, floors, and (iii) swaptions.

Topic VII: The Credit Market (If time allows)

This topic covers the important area of credit markets. The valuation of fixed income securities that face credit risk. The final application will be to discuss the motivation, pricing and risk of credit default swaps.

Final.