

NEW YORK UNIVERSITY STERN SCHOOL OF BUSINESS

Debt Instruments

Syllabus for C15.0026.001, Summer 2010

Instructor Oliver Randall

Office hours: TBA

Meeting location: TBA MW 3-5:55pm

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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

Prerequisites

- Foundations of Financial Markets (C15.0002)
- 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, which will be posted on Blackboard.

Recommended Reading:

- Pietro Veronesi, *Fixed Income Securities: Valuation, Risk, and Risk Management*, Wiley, 2010
- Bruce Tuckman, *Fixed Income Securities*, Wiley, 2002, 2nd edition.
- John Hull, *Futures, Options, and Other Derivatives*, Prentice-Hall, 6th edition, 2005.

Grading:

- Class participation (10%)
- Problem sets (20%)
- Midterm exam (30%)
- Final exam (40%)

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, students should submit individual answers.

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.

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.