Fixed Income Instruments

module 6, academic year 2024-2025

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Course description

The course is designed to provide a framework for the practical analysis of fixed income instruments. The primary focus is to gain skill and knowledge on calculating bond prices and swap prices, understanding interest curves, general hedging practices, and some general principles of the credit analysis.

Course requirements, grading, and attendance policies

Attendency. No formal attendance policy is applied to the course, however, the attendance of each class is expected.

Prerequisites. Familiarity with basic financial products and derivatives is desired, but nor required.

Grading. The course grade is determined by results of home assignments and final exam:

- (40%) Home assignments. Total 3 (three) home assignments are required to be completed thought-out the course.
- (60%) Final exam. The exam covers all topics of the course. The minimum passing threshold of the exam is 40% out of 100%.

The total weighted and adjusted **passing score is 55% out of 100%.**

Course contents

Class		Comments
1	Intro: Interest Rates, Money Market, Debt instruments	• Interest rate, interest environment • Spot and forward rates, FRA • Bond market vs. money market • Types and features of debt securities • Bond properties and characteristics • Basics of bond's math
2	Bond fundamentals 1	• Bond's math cont. (yield, duration, convexity, etc.) • Bond portfolio's math (yield, duration, etc.) • Hedging bond's risks • Bootstrapping zero-coupon (spot) and forward curves

Class		Comments
3	Bond fundamentals 2	• Forward and future bond prices, REPO with bonds • Pricing of floating bonds • Pricing of bonds with options - call, put • Pricing of convertible bonds
4	Interest Rate Swaps	• IRS valuation basics • Bootstrapping swap zero curve • Amortizing IRS • Interest Risk management of IRS • IRS unwinding mechanics • Currency Swaps
5	Asset Swaps	• Asset Swap valuation basics • Yield/Yield and Par/Par ASW • Application of ASW spread for measuring bond credit risk
6	Credit Default Swaps	• Default Rates and Recovery Rates • Quantifying credit risk: probabilities of default, exposure at default, loss given default • CDS valuation basics • Bootstrapping default probabilities • Models to measure credit risk
7	Course overview and fixed-income market overview	• Structured fixed income instruments: CLO, ABS, MBS • Course basics overview • Overview of current debt market issues and problems • What else to learn: commodity instruments, other non-linear instruments

Description of course methodology

1. Students need laptops and Excel to perform exercises for every lesson in the course.
2. Assignments handed/uploaded within one hour after the deadlines are graded with 15% discount.
   Assignments handed/uploaded after the set time limits are considered failed and get zero score.

Course materials

Required textbooks and materials

1. Barbara S. Petitt. Fixed Income Analysis (4th Edition)
2. F.J. Fabozzi. The Handbook of Fixed Income Securities, McGraw Hill (7th Edition)
3. Donald J. Smith. Bond Math: The Theory Behind the Formulas (2nd Edition)
4. John C. Hull. Options, Futures, and Other Derivatives (7th Edition)

Additional materials

1. Darrell Duffie, Kenneth J. Singleton. Credit Risk: Pricing, Measurement, and Management
2. Jiri Witzany. Credit Risk Management: Pricing, Measurement, and Modeling

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.