FIXED INCOME SECURITIES

FRE : 6411

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Fix-Income Securities Syllabus

- Lecture 1: Introduction to Fix Income Securities & US Treasury Debt Instruments. Risk Analysis & Control.

  - Discount Rate, Forward rate and Yield to Maturity (YTM)
  - Price Value of Basis Point (PVBP)
  - Duration, Modified Duration and Bond Yield Elasticity
  - Taylor Series Expansion and Convexity
  - Risk Analysis of Fix Income Portfolios
  - Risk & Factor Control of Fix Income Portfolios

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- Lecture 2 : Introduction to Multi-Period and Multi-Factor Economy & Asset Pricing
    - Multi-Factor, Two Period Economy, Consumption & Investment Options
    - Introduction to Arrow-Debreu Economy, Optimization, Arrow-Debreu Securities & State Pricing
    - Binominal & Trinomial Multi-Period Economy & Asset Price Evolution
- Lecture 3 : Non-Arbitrage Asset Pricing Model
    - Non-Arbitrage Asset Pricing Theory
    - Dynamic Programming and Multi-period Replicating Portfolio
    - Risk-Adjusted(Neutral) Probability and Expectations
    - Complete Market and Derivative Asset Pricing Model
- Lecture 3b : Non-Arbitrage Asset Pricing of Fix Income Securities
    - Swap Rate
    - Forwards & Futures Market
    - Defaultable Fix Income Securities and Pricing

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- **Lecture 4a : Governments Bonds Futures Contracts**
  - CBOT US Treasuries Contracts Specifications
  - Conversion Factor
  - Concept of the Cheapest To Deliver Bonds
  - Pricing of The Futures Contract with Multiple Delivery Options
- **Lecture 4b : Modeling Term-Structure of Assets**
  - Introduction to Term-Structure of Commodity, Volatility and Fix-Income
  - Futures Price of Asset and Expected Price of Asset in future
  - 1st, 2nd and 3rd order Spline Interpolations, and Properties
- **Lecture 5 : Central Banks Yield Term-Structure Modeling**
  - Constant Maturity Treasury
  - Cubic Spline Interpolation
  - Nelson-Siege Interpolation

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- Lecture 6 : Continuous Time & Affine Term Structure Model
  - Continuous instantons rate, forward rate, bond pricing
  - Local Expectation vs. Expectation Hypothesis
  - Introduction to Affine Models
  - Affine Term Structure and Duffie & Kan Model
  - Non-Arbitrage Term Structure vs. Technical Term Structure
- Lecture 7 : Final Exam