Fixed Income Securities, Term Structure Modelling & Trading

FRE 6411

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NYU Finance and Risk Engineering

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COURSE OUTLINE

- Lecture 1: Introduction to Fix Income Securities, Risk and Volatility Measurements and Control. Discrete Stochastic Models
  - Introduction to US Government Bonds, Notes and Zero-Coupon
  - Duration and First Order Risk Measurements
  - Convexity and Higher Orders Risk Measurements
  - Optimal Risk Control and Trading
  - Binominal & Trinomial Models
- Lecture 2: Arbitrage Trading and Arbitrage Free Valuation
  - Arbitrage Trading Strategies, Dynamic Programming, Mimicking Portfolio
  - Arrow-Debreu Equilibrium and State Prices
  - Risk Neutral Valuations & Complete Markets
- Lecture 3: Interest Rate Swaps Forward and Future Contracts
  - Swaps, Future and Forward Contracts Valuations
  - US and International Government Bonds Futures Contract
  - CBOT 10 Year US Treasury Note Futures Contract Valuation with Delivery Option, Option Adjusted Duration and Convexity
  - Australian 10 Year Commonwealth Treasury Bond Futures Contract

COURSE OUTLINE

- Lecture 4-1: Term Structure Modelling & Trading
  - Term Structure of Interest Rate
  - Term Structure of Volatility and VIX
  - Term Structure of Commodities
- Lecture 4-2: Term Structure Modelling & Trading
  - Cubic Spline Modelling & Trading
  - Nelson-Siegel Modelling & Trading
  - Central Banks Estimation of Constant Maturity Yield Curve
- Lecture 5: Affine Term Structure, Pricing & Trading
- Lecture 6: High Frequency & Real Modelling & Trading
  - Introduction to High Frequency Modelling
  - Real Time and High Frequency Modelling of Volatility Term Structure and Trading
  - Real Time and High Frequency Modelling of Constant Maturity Curve and Trading