

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Mathematics - NOC:Mathematical Portfolio Theory

Subject Co-ordinator - Prof. Siddhartha Pratim Chakrabarty

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Probability space and their properties, Random variables
- Lecture 2 - Mean, variance, covariance and their properties
- Lecture 3 - Linear regression; Binomial and normal distribution; Central Limit Theorem
- Lecture 4 - Financial markets
- Lecture 5 - Bonds and stocks
- Lecture 6 - Binomial and geometric Brownian motion (gBm) asset pricing models
- Lecture 7 - Expected return, risk and covariance of returns
- Lecture 8 - Expected return and risk of a portfolio; Minimum variance portfolio
- Lecture 9 - Multi-asset portfolio and Efficient frontier
- Lecture 10 - Capital Market Line and Derivation of efficient frontier
- Lecture 11 - Capital Asset Pricing Model and Single index model
- Lecture 12 - Portfolio performance analysis
- Lecture 13 - Utility functions and expected utility
- Lecture 14 - Risk preferences of investors
- Lecture 15 - Absolute Risk Aversion and Relative Risk Aversion
- Lecture 16 - Portfolio theory with utility functions
- Lecture 17 - Geometric Mean Return and Roy's Safety-First Criterion
- Lecture 18 - Kataoka's Safety-First Criterion and Telser's Safety-First Criterion
- Lecture 19 - Semi-variance framework
- Lecture 20 - Stochastic dominance; First order stochastic dominance
- Lecture 21 - Second order stochastic dominance and Third order stochastic dominance
- Lecture 22 - Discrete time model and utility function
- Lecture 23 - Optimal portfolio for single-period discrete time model
- Lecture 24 - Optimal portfolio for multi-period discrete time model; Discrete Dynamic Programming
- Lecture 25 - Continuous time model; Hamilton-Jacobi-Bellman PDE
- Lecture 26 - Hamilton-Jacobi-Bellman PDE; Duality/Martingale Approach
- Lecture 27 - Duality/Martingale Approach in Discrete and Continuous Time
- Lecture 28 - Interest rates and bonds; Duration
- Lecture 29 - Duration; Immunization

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- Lecture 30 - Convexity; Hedging and Immunization
- Lecture 31 - Quantiles and their properties
- Lecture 32 - Value-at-Risk and its properties
- Lecture 33 - Average Value-at-Risk and its properties
- Lecture 34 - Asset allocation
- Lecture 35 - Portfolio optimization
- Lecture 36 - Portfolio optimization with constraints, Value-at-Risk