DA241 Introduction to Finance

Instructor:

Course Description: DA241 covers theoretical, computational, and interpretive issues of Finance using R, Python and excel.

Prerequisite(s): Basic Statistics, probability and stochastic processes.
Credit: 2 (four), approximately 32 credit hours

Text(s):

1. John C.Hull- Options, Futures and Other Derivatives
2. Sheldon M. Ross- An elementary introduction to mathematical finance
3. Chi-fu Huang, Robert H. Litzenberger- Foundations for financial economics
4. Gopinath Kallianpur, Rajeeva L. Karandikar- Introduction to option pricing theory

Knowledge gained: The students get to know

- Overview of portfolio, asset, stock
- Optimal portfolio selection
- Portfolio frontier
- Minimum variance portfolio, zero co-variance portfolio and Risk Neutral portfolio
- Overview of Option Pricing, call and put option, Payoff, arbitrage and derivative
- Overview of Hedging parameter
- Trading strategy and self financing
- Binomial model for option pricing and complete market
- American and European option pricing
- Distribution of stock prices by Cox-Ross-Rubinstein formula
- Derivation and application of Black Sholes formula

Skills acquired: The student will be able to

- Optimize portfolio on the collected historical Sensex data of different company for giving maximum return with minimum risk.
- Analyze the pattern of return of different company from historical Sensex data.
- Predict the return for a certain amount of time for different company and to check their prediction accuracy from the actual data.
- Apply Binomial Model in real life Put Call parity problems and also understand model working procedure by simulated data.
- Apply Black Sholes formula in real life scenarios and also on simulated data

Course Syllabus:

1. Mortgages and loans and other borrowings. Investment portfolio, portfolio optimization, Different kind of portfolios.
2. Concept of options, Assets , Stocks , Derivatives, Put and Call options (American and European),
3. Arbitrage and Hedging, Uses of them in market scenario
4. Binomial model, Cox-Ross-Rubinstein formula, Black-Sholes formula and their derivation