

SEMESTER – VIII

MJC-16: Mathematical Finance

Course Outcomes

After the completion of the course, the student will be able to:

CO1: Interest rates and its types.

CO2: Financial markets and derivatives including options and futures.

CO3: Pricing and hedging of options, interest rate swaps and no-Arbitrage pricing concept.

MJC-16 : Mathematical Finance (Theory: 4 credits) Full Marks-100		
Unit	Topics to be covered	No. of Lectures
1	Interest rates, Types of rates, Measuring interest rates, Zero rates, Bond pricing, Forward rate, Duration, Convexity, Exchange traded markets and OTC markets.	10
2	Derivatives--Forward contracts, Futures contract, Options, Types of traders, Hedging, Speculation, Arbitrage, No Arbitrage principle, Short selling, Forward price for an investment asset.	10
3	Types of Options, Option positions, Underlying assets, Factors affecting option prices, Bounds on option prices, Put-call parity, Early exercise, Effect of dividends.	10
4	Binomial option pricing model, Risk neutral valuation (for European and American options on assets following binomial tree model), Lognormal property of stock prices, Distribution of rate of return, expected return.	10
	TOTAL	40

Book References:

1. Hull, J. C., & Basu, S. (2010). Options, Futures and Other Derivatives (7th ed.). Pearson Education. New Delhi.
2. Luenberger, David G. (1998). Investment Science, Oxford University Press. Delhi.
3. Ross, Sheldon M. (2011). An elementary Introduction to Mathematical Finance (3rd ed.). Cambridge University Press. USA.