20BSM312E					Financial Mathematics					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs. / Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	0	0	3	3	25	50	25	--	--	100

COURSE OBJECTIVES

- To be able to understand the basic concepts of the interest.
- To learn about different types of deterministic cash flows.
- To be able to understand about different types of random cash flows.
- To learn about different mathematical models related to financial derivatives.

UNIT 1 BASIC CONCEPTS **08 Hrs.**

Arbitrage, Return and Interest, Time Value of Money, Bonds, Shares and Indices, Models and Assumptions.

UNIT 2 DETERMINISTIC CASH FLOWS **10 Hrs.**

Net Present Value (NPV), Internal Rate of Return (IRR), Comparison of IRR and NPV, Bonds price and yield, Clean and Dirty Price, Price – Yield Curves, Duration, Term structure of Interest rates, Immunization, Convexity.

UNIT 3 RANDOM CASH FLOWS **09 Hrs.**

Random Returns, Portfolio Diagrams and Efficiency, Feasible Set, Markowitz Model, Financial Derivatives.

UNIT 4 OPTIONS & BLACK-SCHOLES MODEL **13 Hrs.**

Call Options, Put Options, Put-Call Parity, Binomial Options Pricing Model, Risk-Neutral Valuation, The Black-Scholes Formula, Options on Future, Options on Assets with Dividends, Black-Scholes and BOPM, Implied Volatility.

40 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 – Understand the relationship between risk and profit.

CO2 – Explain various types of annuities and perpetuities in detail and apply them to solve financial transactions problems.

CO3 – Demonstrate understanding and competence with the financial models.

CO4 – Apply the concepts of random cash flows to evaluate returns and interest on various investments.

CO5 – Distinguish net present value and internal rate of return and understand their individual role.

CO6 – Create an ability to formulate return and interest on different investment like bonds, shares, mutual funds etc.

TEXT / REFERENCE BOOKS

1. Amber Habib, The Calculus of Finance, Universities Press, 1st ed.,2011.
2. G. Campolieti and R.N. Makarov, Financial Mathematics: A Comprehensive Treatment, CRC Press, 1st ed., 2014.
3. R.J. Williams, Introduction to Mathematics of Finance, American Mathematical Society, 2006.
4. J. R. Buchanan, An Undergraduate Introduction to Financial Mathematics, World Scientific, 2006.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100 Exam Duration: 3 Hrs.

Part A: 6 questions of 4 marks each 24 Marks

Part B: 6 questions of 8 marks each 48 Marks

Part C: 2 questions of 14 marks each 28 Marks