Course Type	Course Code	Name of Course	L	T	P	Credit
DE	EMSD506	Quantitative Finance	3	0	0	3

Course Objective
• The aim of this course is to give exposure to the basics of quantitative finance and its application to the financial markets.

Learning Outcomes
• To develop a basic understanding of tools and techniques for financial analysis and its application to the financial markets. • Able to apply advanced quantitative financial models for financial analysis • Able to understand, build and estimate the financial forecasting models. • To develop an understanding of the concepts of modelling financial risk and valuation of financial instruments.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	**Introduction to Quantitative Finance and Financial Analysis**: Scope and Applications of Quantitative Finance, Fundamental Theories in Financial Research, Techniques to Prepare Financial Data for Analysis using Statistical Software, Choice of Univariate and Multivariate Statistical Techniques for Financial Analysis using Statistical Software	6	To develop a basic understanding of univariate and multivariate statistical techniques for financial data analysis
2	**Financial Time Series Analysis**: Introduction to financial time series analysis, Financial Data Forecasting Methods and Techniques, Application of Forecasting Tools and Techniques using Statistical Software, Measuring Forecast Accuracy using Statistical Software	8	To familiarize the student with the financial time series analysis and forecasting tools and techniques
3	**Valuation of Bonds and Shares**: Bonds Values and Yields, Bond Values and Interest Rates, The Term Structure of Interest Rate, Valuation of Preference Shares, Valuation of Ordinary Shares, Equity Capitalization Rate, Linkages Between Share Price, Earnings and Dividends	6	To develop a basic understanding of tools and techniques for the valuation of bonds and shares

4	**Financial Risk Analysis**: Introduction to Financial Risk, Introduction to statistics and econometrics for Financial Risk Analysis, Market Risk Analysis: VAR/ back testing/ stress testing/ scenario/ sensitivity analysis etc. using statistical software, Introduction to Credit and Operational Risk, Scope of credit and operational risk in financial markets, Techniques for Modelling credit and operational Risk: Probability of default/loss given default, Risk-Adjusted performance, Basel norms etc., Evolving issues in Risk Management.	8	Understanding the concepts of financial risk analysis through various risk assessment models
5	**Financial Risk Management**: Foundations of Financial Risk Management, Risk Management in Equity, fixed-income, and forex markets. Financial Risk Hedging Strategies, Derivatives Markets and Instruments. Forwards, Futures, Options and Swaps Contract Trading Strategies	8	To make students conversant with financial risk management and introduce them to financial instruments for hedging financial risk.
6	**Cluster Trading and Financial Data Reduction Techniques**: Data Reduction Techniques and Cluster Trading in Financial Markets using Statistical Software: Scope and Introduction to the Techniques, Potential Applications in Financial Trading and Analysis, Assessing the Validation of the Models	6	Understanding the scope of Cluster Trading and financial data reduction techniques and their application in financial analysis.
	Total	42	

Text Books:

1. Financial Risk Manager Handbook by Philippe Jorion, 6th Edition, John Wiley & Sons Inc. (2003)
2. Forecasting Methods and Applications by Makridakis, S., Wheelwright, S. C., & Hyndman, R. J., 3rd Edition, John Wiley & Sons Inc. (2008)
3. Analyzing Multivariate Data by Lattin, J. M., Carroll, J. D., & Green, P. E., 1st Edition, Cengage Learning India. (2006)
4. Introductory Econometrics for Finance by Chris Brooks, 4th Edition, Cambridge University Press. (2019)

Note: Case Studies and relevant research papers will be provided by the instructor