SEMESTER-I

Business Mathematics

Multi-disciplinary Course (MDC)

Total Marks: 75 (Theory 45, Internal 30)
No of Credit: 3
No. of Contact Hours: 45

Course Objective: To bridge the gap between pure mathematical theory and applied commercial environments; to equip students with the quantitative, logical and financial skills required to solve real world business, economic and managerial problems.

Course Outcomes:
After successful completion of this course, students will be able to:
CO1: Apply mathematical techniques such as ratio, proportion, interest, annuities, and shares in solving business and financial problems.
CO2: Use matrices, determinants, and systems of linear equations for quantitative business analysis.
CO3: Formulate and solve basic Linear Programming Problems (LPP) using graphical methods for optimization in business decision-making.
CO4: Apply differential calculus in marginal analysis, maxima-minima problems, and business optimization.
CO5: Use integral calculus to determine total cost, total revenue, and other simple business-related measures.
CO6: Develop analytical, logical, and quantitative problem-solving skills applicable in commerce, economics, and management studies.

Unit I: Business Mathematics and Financial Applications; Ratio and Proportion: Business-related problems and finding missing terms, Profit, Loss, and Discount: Applications in commerce and trade., Simple Interest and Compound Interest: Calculation and business applications, Present Value (PV) and Future Value (FV): Basic financial calculations, Annuities: Ordinary annuity and annuity due, Shares: Face value, market value, dividend, and bonus shares, System of Simple Linear Equations: Basic applications in business problems.
(No. of classes: 15, Marks: 15)

Unit II: Matrices and Linear Programming; Definition and types of matrices, Matrix operations: addition, subtraction, and multiplication, Determinants of square matrices up to order three, Inverse of a matrix by adjoint method, Solution of Linear Equations**,** Solution of simultaneous linear equations (up to three variables) using Cramer's Rule, Formulation of Linear Programming Problems (LPP), Graphical solution of LPP and feasible region, Business applications of optimization problems.
(No. of classes: 15, Marks: 15)

Unit III: Differential and Integral Calculus for Business; Concept of Limit and Continuity: For simple functions, Concept of Differentiation: Basic rules of differentiation, Differentiation of Polynomial functions, Rational functions, Exponential functions (e^x), Logarithmic functions ($logx$)— simple results only, Derivatives of Exponential and Logarithmic Functions (basic results only), Maxima and Minima: Applications in cost, revenue, and profit functions, Marginal Analysis: Business applications, Introduction to Integration: Definite Integrals for simple polynomial functions, Application of Integration in Marginal Analysis: Total cost from marginal cost, Total revenue from marginal revenue, Consumer and producer related simple applications.
(No. of classes: 15, Marks: 15)

Text Books:

1. A Textbook of Business Mathematics – Dr. Padmalochan Hazarika (S. Chand Publishing)
2. Business Mathematics: Theory and Applications – V.K. Kapoor

Reference Books:

1. Business Mathematics, N.K Nag and S. K. Nag, Kalyani Publisher
2. Singh, J.K.; Business Mathematics, Himalaya Publishing House