

S.Y.B.COM
Semester -III
Statistics Paper 2: Numerical Analysis (Major Paper 2) - Credit 4
Course Outcomes (COs)

On completion of the course, the students will be able to:

CO1	Understand the advance concept of finite difference and interpolation for both equal and unequal intervals.
CO2	Understand relation between numerical differentiation and integration.
CO3	Understand Newton Forward and Backward method and its application.
CO4	Understand basic concepts of finding roots and the methods of finding roots.
CO5	Apply the course content for the further study of statistics.

OBJECTIVE

The main objective of this course is to provide fundamental knowledge of finite difference, interpolation, numerical differentiation, numerical integration and iterative methods of finding roots and its procedures. The students should be able to understand the concept so that they can use it for the real life practical problem.

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Sr.No.	Course Inputs (As per UGC Model Curriculum)	Weightage	Marks
Unit -1	Finite Difference: ➤ Concept of finite differences, Finite difference table ➤ Concept of interpolation, Assumption, Uses. Interpolation for equal intervals: - ➤ Binomial expansion method (Without proof only application) ➤ Newton's Forward Difference Formula (Without proof only application) ➤ Newton's Backward Difference Formula (Without proof only application)	30%	15
Unit-2	Interpolation for unequal intervals : ➤ Newton's Divided Difference Formula (Without proof only application) Lagrange's Interpolation formula (Without proof only application)	10%	5
Unit-3	Numerical Integration and Differentiation : ➤ Concept of numerical integration ➤ General Quadrature Formula For Equidistant Ordinates (Without proof) ➤ Trapezoidal rule, Simpson's one- third rule, Simpson's three- eight rule Concept of numerical differentiation. ➤ Differentiation based on Newton's forward and Newton's backward formula. (Without proof only application)	30%	15
Unit-4	Iterative Methods for Finding Roots Iterative procedures: ➤ Bisection Method (Without proof only examples) ➤ Regula Falsi Method (Without proof only examples) ➤ Fixed Point Iteration Method (Without proof only examples) ➤ Secant Method (Without proof only examples) ➤ Newton - Raphson Method (Without proof only examples)	30%	15
Grand Total		100%	50

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Reference Books:		
1.	Shastri, S.S	Introductory methods of Numerical Analysis; Prentice Hall of India
2.	Jain, M.K., Iyengar, S.R.K. and Jain, R.K	Numerical methods for scientific and Engineering Computations; Age International (P.) Ltd.
3.	Froberg, C. E	Introduction to Numerical Analysis, Addition Wesley, Reading Mass.
4.	Gupta and Kapoor	Fundamentals of mathematical statistics
5.	H. Freeman	Finite difference for actual sciences.
6	Stanton R. G	Numerical Methods for Science and Engineering Prentice Hall of India.

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S.Y.B.COM
Semester -III

Statistics Paper 1 : Statistics for Business Decision (Major/MDC Paper-I) - Credit 4

Course Outcomes (COs)

On completion of the course, the students will be able to:

CO1	Understand the basic concept of decision theory.
CO2	Understand the basic concept of operations research.
CO3	Understand the concept of Assignment problems.
CO4	Understand the concept of Transportation problems.
CO5	Apply the course content for the further study of statistics.

OBJECTIVE

The main objective of this course is to provide fundamental knowledge of decision theory, assignment problems and transportation problems. The purpose is to make students aware about the application of decision theory and different operations research techniques for real life examples.

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Sr.No.	Course inputs (as per UGC model curriculum)	Weightage	Marks
Unit -1	Elementary decision theory: ➤ Meaning and scope of decision theory, basic elements of a statistical decision problem, decision analysis, pay off matrix, decisions under certainty, decisions under uncertainty, Laplace criteria, maximin criteria, Hurwitz criteria, Minimax regret criteria: decision making under risk, expected monetary value (EMV), expected opportunity loss (EOL), expected value of perfect information (EVPI), decision tree.	40%	20
Unit -2	Operations Research – I: ➤ Definition and scope of O.R. ➤ Linear programming Problem: ➤ Definition of general LPP, formulation of LPP, examples of LPP occurring in various fields graphical solution of LPP (two variables) ➤ Hungarian method for solving an assignment problem, variations in assignment problems	20%	10
Unit -3	Transportation problems: ➤ Balanced and unbalanced TP, methods for initial basic feasible solution (IBFS), matrix minima method, Vogel's approximation method (VAM) and min(max) & max(min) method, optimality test, MODI method for improving an IBFS, optimal solution	20%	10
Unit -4	Assignment problem: ➤ Hungarian method for solving an assignment problem, variations in assignment problems	20%	10
Grand Total		100%	50

Reference Books:	
Raiffa H.&Schlaifer R,	Applied statistical decision theory, MIT press, 1968
Goon A.M., Gupta M.K., & Das Gupta B	Fundamentals of statistics , World press, Kolkata, 1991
ElhanceD.N	Fundamentals of statistics , Kitab Mahal, Allahabad, 1986
S D Sharma	Optimization technique,
Swarupkanti, Gupta, P.K. And Manmohan(2007):	Operations Research, 13th Edition, Sultan Chand and Sons.
Taha, H. A. (2007):	Operation Research: An Introduction, 8th Edition, And Prentice Hall of India.
GassS.I	Linear Programming and Application McGraw Hills,1975

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