



(20 DS 401)

Pre-Requisite: None.

- Compute various measures of central tendency, dispersion, skewness, kurtosis and interpret them.
- Learn about elementary nonparametric testing procedures and use them for analyzing real data for drawing statistical inferences and also are able to design, use and interpret control charts for both variables and attributes.
- Model competitive real-world phenomena using concepts from game theory, analyze pure and mixed strategies.
- Select best strategy from various alternatives of decision making under uncertainty Conditions using different criterion for uncertainty and also can apply dynamic programming approach to real world problems wherever applicable

CO1	Analyze the whole idea on a frequency distribution with the help of measures of central tendency, measures of dispersion, skewness and kurtosis.
CO2	Adapt nonparametric testing procedures for drawing statistical inferences in data analysing problems and Construct Quality control charts for variables and attributes.
CO3	Solve Games with/without saddle points using algebraic method, graphical method and principle of dominance for achieving optimum best mixed strategies.
CO4	Utilize dynamic programming algorithm to solve real world problems and choose appropriate decision under uncertainty conditions

		POs										
	CO	1	2	3	4	5	6	7	8	9	10	11
	CO1	3	3	3	3	-	-	-	-	-	-	3
	CO2	3	2	2	3	-	-	-	-	-	-	2
	CO3	3	2	3	2	-	-	-	-	-	-	2
	CO4	3	3	2	2	-	-	-	-	-	-	2

Measures of dispersion: Dispersion, measures of dispersion, range, quartile deviation, mean



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deviation, standard deviation and root mean square deviation, Moments, skewness, kurtosis.

(Sections: 2.3, 2.5, 2.6, 2.7, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 3.7.1, 3.7.2, 3.9, 3.9.1, 3.13, 3.14 of Text Book 1)

UNIT-II

Non-Parametric Tests: Introduction, Sign test, Rank-sum test, Correlation based on ranks, tests of randomness, Kolmogorov Smirnov and Anderson-Darling tests.

Statistical Quality Control: Quality control, Control charts for measurements, Control charts for attributes, Tolerance limits.

(Sections: 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 15.4, 15.5, 15.6, 15.7 of Text Book 2)

UNIT-III

GAMES AND STRATEGIES: Introduction; Two-person Zero –Sum Games; Some Basic terms; The Maximin-Minimax Principle; Games Without Saddle Points-Mixed Strategies; Graphic Solution of $2 \times n$ and $m \times 2$ games; Dominance Property.

(Sections: 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7 of Text Book 3)

UNIT-IV

Decision Analysis: Introduction, Decision making problem, Decision-making process, Decision-making environment, Decisions under uncertainty.

DYNAMIC PROGRAMMING: Introduction; The Recursive Equation Approach, Characteristics of Dynamic Programming; Dynamic Programming Algorithm.

(Sections: 16.1, 16.2, 16.3, 16.4, 16.5, 13.1, 13.2, 13.3, 13.4 of Text Book 3)

Text Books :

1. Fundamentals of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, 10th edition.
2. Probability and Statistics for Engineers, Richard A. Johnson, 8th edition, PHI.
3. Operations Research, Kanti Swaroop, P.K. Gupta, Manmohan, 13th edition, Sultan Chand & Sons. 2007.

References :

- [1] 1. Probability & Statistics for Engineers and Scientists', R.E Walpole, R.H. Myers & S.L. Myers, 6th edition, PHI,
- [2] Operations Research, SD Sharma, Kedarnath Ramnath & Co, Meerut.