

SES's L.S. RAHEJA COLLEGE OF ARTS AND COMMERCE (AUTONOMOUS)



BOARD OF STUDIES: Department of Mathematics, Statistics and Computer

PROGRAMME: Bachelor of Science (Information Technology)

SEMESTER: III

NOMENCLATURE OF THE COURSE: Computer Oriented Statistical Techniques

NEP Vertical: Minor

Credit: 02

(As Per Choice Based Credit System (under NEP 2020) with effect from the academic year 2025-26)



Programme:	Bachelor of Science (Information Technology)
Nomenclature of the Course	Computer Oriented Statistical Techniques
Total Marks	50
Semester:	III
Academic year	2025-26

LEARNING OBJECTIVES:

1. To learn the different methods of calculating the central tendencies.
2. To learn scientific view to conduct the survey in proper way to collect the data about specific perspective.
3. To learn the sampling theory and testing of hypothesis and making inferences.

COURSE OUTCOMES:

1. To calculate and apply measures of central tendencies and measures of dispersion grouped and ungrouped data cases.
2. Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.
3. Evaluate various statistical techniques for data analysis.

Unit	Course Content	Andragogy	No of Lectures
I	<p>1.1 Measures of Central Tendency: Index, or Subscript, Notation, Summation Notation, Averages, or Measures of Central Tendency ,The Arithmetic Mean , The Weighted Arithmetic Mean ,Properties of the Arithmetic Mean ,The Arithmetic Mean Computed from Grouped Data ,The Median ,The Mode, The Empirical Relation Between the Mean, Median, and Mode, The Geometric Mean G, The Harmonic Mean H ,The Relation Between the Arithmetic, Geometric, and Harmonic Means, The Root Mean Square, Quartiles, Deciles, and Percentiles, Software and Measures of Central Tendency.</p> <p>1.2 Measures of Dispersion: Dispersion, or Variation, The Range, The Mean Deviation, The Semi-Interquartile Range, The 10–90 Percentile Range, The Standard Deviation, The Variance, Short Methods for Computing the Standard Deviation, Properties of the Standard Deviation, Charlie’s Check, Sheppard’s Correction for Variance, Empirical Relations Between Measures of Dispersion, Absolute and Relative Dispersion; Coefficient of</p>	<ul style="list-style-type: none"> • Give students problems: Provide problems for students to solve independently or in groups. • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. • Use real-life examples: Incorporate real life examples into lessons. • Consider self-concept: Give adults autonomy over 	<p>8</p> <p>7</p>

	Variation, Standardized Variable; Standard Scores, Software and Measures of Dispersion. 1.3 1.3: Introduction to R: Basic syntax, data types, variables, operators, control statements, R-functions, R –Vectors, R – lists, R Arrays.	their learning so they can thrive on self-direction	
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II	<p>2.1 Statistical Decision Theory: Statistical Decisions, Statistical Hypotheses, Tests of Hypotheses and Significance, or Decision Rules, Type I and Type II Errors, Level of Significance, Tests Involving Normal Distributions, Two-Tailed and One-Tailed Tests, Special Tests, Operating-Characteristic Curves; the Power of a Test, p-Values for Hypotheses Tests, Control Charts, Tests Involving Sample Differences, Tests Involving Binomial Distributions.</p> <p>2.2 Statistics in R: mean, median, mode, Normal Distribution, Binomial Distribution, Frequency Distribution in R.</p> <p>2.3 Small Sampling Theory: Small Samples, Student’s t Distribution, Confidence Intervals, Tests of Hypotheses and Significance, The Chi-Square Distribution, Confidence Intervals for Sigma , Degrees of Freedom, The F Distribution.</p> <p>2.4 The Chi-Square Test: Observed and Theoretical Frequencies, Definition of chi-square, Significance Tests, The Chi-Square Test for Goodness of Fit, Contingency Tables, Yates’ Correction for Continuity, Simple Formulas for Computing chi-square, Coefficient of Contingency, Correlation of Attributes, Additive Property of chi-square.</p>	<ul style="list-style-type: none"> Give students problems: Provide problems for students to solve independently or in groups. 4 	
		<ul style="list-style-type: none"> Focus on practical applications: Present knowledge and abilities in terms of their practical uses. 3 	
		<ul style="list-style-type: none"> Use real-life examples: Incorporate real life examples into lessons. 4 	
		<ul style="list-style-type: none"> Consider self-concept: Give adults autonomy over their learning so they can thrive on self-direction 4 	

SUGGESTED READINGS

1. Murray R. Spiegel, Larry J. Stephens, STATISTICS, McGRAW – HILL INTERNATIONAL
2. R.B. Patil, H.J. Dand and R. Bhavsar, A Practical Approach using R, SPD
3. S.C. GUPTA and V.K. KAPOOR, FUNDAMENTAL OF MATHEMATICAL STATISTICS, SULTAN CHAND and SONS.

QUESTION PAPER PATTERN

(A) FOR CONTINUOUS EVALUATION RUBRICS

FOR CONTINUOUS EVALUATION

Total : 20 marks

Presentation	10 Marks
Assignment ,Class Participation	10 Marks

(B) QUESTION PAPER PATTERN FOR SEMESTER END EXAMINATION

Total : 30marks

Q1 Answer any three out of the following Four questions (based on Module I) $5*3=15$

Q2 Answer any three out of the following Four questions (Based on Module II) $5*3=15$