

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



BOARD OF STUDIES: Information Technology and Data Science

PROGRAMME: Bachelor of Science (Information Technology)

SEMESTER: III

NOMENCLATURE OF THE COURSE: Statistical Analysis Tools Lab

NEP Vertical: VSC

Credit: 01

(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	Statistical Analysis Tools Lab
Total Marks	25
Semester:	III
Academic year	2025-26

LEARNING OBJECTIVES:

1. Understand how to execute basic commands and work with data structures such as arrays, lists, and data frames in R / Python.
2. Learn to create matrices in R/Python and perform mathematical operations on them.
3. Apply statistical functions such as mean, median, mode, quartiles, range, interquartile range, and histograms to analyze data in R/Python.
4. Perform calculations like standard deviation, variance, covariance, hypothesis testing, and Chi-squared tests on various types of data samples.

COURSE OUTCOMES:

1. To execute basic commands and effectively use arrays, lists, and data frames in R/Python, applying them in data manipulation tasks.
2. To create matrices in R/Python and perform key matrix operations, demonstrating proficiency in matrix manipulation.
3. To calculate and interpret the mean, median, mode, quartiles, range, interquartile range, and generate histograms, enabling basic exploratory data analysis.
4. To calculate key statistics and perform hypothesis testing and Chi-squared tests on real-world datasets.

Unit	Course Content	Andragogy	No of Lectures
I	Using R/Python execute the basic commands, array, list and frames.	<ul style="list-style-type: none"> • Encourage self-directed learning: Allow students to choose their learning methods and materials. • Use real-life examples: Incorporate real-life examples into lessons. • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. 	6
II	Create a Matrix using R/Python and Perform the operations addition, inverse, transpose and multiplication operations.	<ul style="list-style-type: none"> • Encourage self-directed learning: Allow students to choose their learning methods and materials. • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. 	6
III	Using R/Python Execute the statistical functions: mean, median, mode, quartiles, range, inter quartile range histogram	<ul style="list-style-type: none"> • Encourage self-directed learning: Allow students to choose their learning methods and materials. • Use real-life examples: Incorporate real-life examples into lessons. 	6

		<ul style="list-style-type: none"> • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. 	
IV	Using R/Python import the data from Excel / .CSV file and Calculate the standard deviation, variance, co-variance.	<ul style="list-style-type: none"> • Encourage self-directed learning: Allow students to choose their learning methods and materials. • Use real-life examples: Incorporate real-life examples into lessons. • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. 	6
V	Import the data from Excel / .CSV and perform the hypothesis testing. Import the data from Excel / .CSV and perform the Chi-squared Test.	<ul style="list-style-type: none"> • Encourage self-directed learning: Allow students to choose their learning methods and materials. • Use real-life examples: Incorporate real-life examples into lessons. • Focus on practical applications: Present knowledge and abilities in terms of their practical uses. 	6

SUGGESTED READINGS

1. R.B. Patil, H.J. Dand and R. Dahake, A Practical Approach to R Tool, SPD
2. Murray R. Spiegel, Larry J. Stephens, STATISTICS, McGRAW –HILL INTERNATIONAL

QUESTION PAPER PATTERN

(B)

QUESTION PAPER PATTERN FOR SEMESTER END EXAMINATION

1.	Practical	15
2.	Journal	5
3.	Viva-Voce	5