

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



**BOARD OF STUDIES: Information Technology and Data Science**

Programme: B.Sc. (Artificial Intelligence & Data Science)

Semester: II

Nomenclature of the Course: Statistics Lab

NEP Vertical: Major

Credit: 01

Total Marks: 25

Academic Year: 2026–27

*(As per Choice Based Credit System under NEP 2020)*



## List of Practical

*All practicals must be implemented using Python (NumPy, Pandas, Matplotlib, Seaborn, SciPy, Statsmodels) OR equivalent analytical tools such as Excel, Power BI, or Tableau where applicable.*

### 1. Descriptive Statistics using Python

- Compute Mean, Median, Mode
- Variance & Standard Deviation using NumPy/Pandas

### 2. Exploratory Data Analysis (EDA)

- Summary statistics using .describe()
- Missing value handling
- Dataset cleaning

### 3. Data Visualization

- Histogram, Boxplot, Scatter Plot using Matplotlib/Seaborn
- Interpret distribution patterns

### 4. Probability Distribution Simulation

- Generate random variables
- Simulate normal distribution
- Visualize probability curves

### 5. Correlation Analysis

- Compute Pearson correlation
- Heatmap visualization
- Interpret strength of relationship

### 6. Simple Linear Regression

- Fit regression model using Statsmodels/Scikit-learn
- Plot regression line
- Interpret coefficients

### 7. Sampling Techniques

- Perform random sampling from dataset
- Compare sample vs population mean

### 8. Hypothesis Testing

- One-sample z-test or t-test using SciPy
- Interpret p-value and decision

### 9. Confidence Interval Estimation

- Compute 95% confidence interval
- Visual representation

### 10. Mini Data Analytics Case Study

- Real dataset (Sales / Academic / Survey Data)
- Perform complete statistical analysis
- Submit interpretation report

## Learning Objectives

1. To apply statistical concepts using modern data analytics tools.
2. To perform exploratory data analysis (EDA).
3. To build regression models and interpret results.
4. To conduct hypothesis testing using statistical libraries.
5. To present statistical insights visually and analytically.

## Course Outcomes (CO)

| CO No. | Course Outcome                                        | Bloom's Level            |
|--------|-------------------------------------------------------|--------------------------|
| CO1    | Perform statistical analysis using Python libraries   | Apply (L3)               |
| CO2    | Conduct exploratory data analysis on datasets         | Analyze (L4)             |
| CO3    | Implement regression and hypothesis testing models    | Apply (L3), Analyze (L4) |
| CO4    | Interpret statistical outputs for decision making     | Analyze (L4)             |
| CO5    | Present analytical findings using visualization tools | Apply (L3)               |

## Evaluation Scheme

### Continuous Evaluation (Internal – 25 Marks)

| Component      | Marks     |
|----------------|-----------|
| Journal        | 5         |
| Viva           | 5         |
| Practical Exam | 15        |
| <b>Total</b>   | <b>25</b> |