

Practicals to be done in the Computer Lab using Statistical Software R:

[1] Chapter 14 (Exercises 1 to 3). [2] Relevant exercises of Chapters 2 to 5, and 7.

Note: The practical may be done on the database to be downloaded from <https://data.gov.in/>

Teaching Plan (Theory of SEC-4: Statistical Software: R):

Weeks 1 to 3: Introducing R, using R as a calculator; Explore data and relationships in R, Reading and getting data into R: Combine and scan commands, viewing named objects and removing objects from R, Types and structures of data items with their properties, Working with history commands, Saving work in R.

[1] Chapter 14 (Sections 14.1 to 14.4).

[2] Chapter 2.

Weeks 4 and 5: Manipulating vectors, Data frames, Matrices and lists; Viewing objects within objects, Constructing data objects and their conversions.

[2] Chapter 3.

Weeks 6 to 8: Summary commands: Summary statistics for vectors, Data frames, Matrices and lists; Summary tables.

[2] Chapter 4.

Weeks 9 to 11: Stem and leaf plot, Histograms, Density function and its plotting, The Shapiro–Wilk test for normality, The Kolmogorov-Smirnov test.

[2] Chapter 5.

Weeks 12 to 14: Plotting in R: Box-whisker plots, Scatter plots, Pairs plots, Line charts, Pie charts, Cleveland dot charts, Bar charts; Copy and save graphics to other applications.

[1] Chapter 14 (Section 14.7).

[2] Chapter 7.

Facilitating the Achievement of Course Learning Outcomes

| Unit No. | Course Learning Outcomes | Teaching and Learning Activity | Assessment Tasks |
|----------|---|---|--|
| 1. | Be familiar with R syntax and use R as a calculator. Understand the concepts of objects, vectors and data types. | (i) Topics to be explained with illustrations using R software. (ii) Students to be given homework/assignments. (iii) Students to be encouraged to look for new applications. | <ul style="list-style-type: none"> • Presentations and participation in discussions. • Assignments and class tests. • Mid-term examinations. • Practical examinations. • End-term examinations. |
| 2. | Know about summary commands and summary table in R. | | |
| 3. | Visualize distribution of data in R and learn about normality test. | | |
| 4. | Plot various graphs and charts using R. | | |

Keywords: Objects, Vectors, Data types, Summary commands, Shapiro–Wilk test, Bar charts.