

COURSE OUTLINE

Statistical Analysis using R

Aim of Course:

This course will provide a basic introduction to R, and its use in organizing and exploring data. The emphasis is on understanding and working with fundamental R data structures and we will introduce some basic R programming techniques. Once you've completed this course you'll be able to enter, save, retrieve, manipulate, and summarize data using R; you will also have the proper foundation to build your programming skills in R and take advantage of the full power of R.

Course Program:

SESSION 1: Getting Started with R

- What is statistical programming?
- The R package
- Installation of R
- The R command line
- Function calls, symbols, and assignment
- Packages
- Getting help on R
- Basic features of R
- Calculating with R

SESSION 2: Matrices, Array, Lists, and Data Frames

- Character vectors
- Operations on the logical vectors
- Creating the matrices and operations on it
- Creating the array and operations on it
- Creating the lists and operations on it
- Making data frames
- Working with data frames

SESSION 3: Editing and Reading Data from Files

- Data types and data structures
- Editing data in R
- Generating data from any distribution
- Reading a data from a file

- Loading data from other R packages
- Save the data in R

SESSION 4: Exploratory Data Analysis (EDA) and Regression Analysis

- Features of data distributions
- Plotting data
- Descriptive statistics for generated data
- EDA such as: Stem-and-leaf plot, Histogram, and Boxplot
- Estimating linear regression model
- Advanced statistical Models

SESSION 5: Programming in R

- Creating the script file in R
- Run R-code file
- Different types of loops such as: for() and while() loops
- Use if statements in for loops
- Fast loops
- Introduction to Simulation and modeling

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