R PROGRAMMING

CREDITS: 3

OBJECTIVE:
- To study the fundamentals of R programming to apply in quantitative analysis.

UNIT I - GETTING STARTED WITH R   **9**
Installing R - The R environment - R packages - Basics of R - Data Structures - Reading data into R - Graphics in R.

UNIT II - FUNCTIONS AND STATEMENTS   **9**
Writing R functions - Control Statements (if and else, switch, if else, compound tests) - Loops in R (for, while, controlling loops) - Applications using the functions and loops.

UNIT III - DATA MANIPULATION AND ANALYSIS   **9**
Group manipulation - Data Reshaping - Manipulating Strings - Basic Statistics using R (Summaries, Correlation, t-tests, ANOVA)

UNIT IV - LINEAR MODELS USING R   **9**
Linear Models - Simple and Multiple regression, GLM - Logit Regression, Model diagnostics - Residuals, Cross validation, Boot strapping.

UNIT V - NON-LINEAR MODELS, TIME SERIES AND CLUSTERING USING R   **9**
Nonlinear Models - Non-Linear least square, Splines, Generalised Additive Models, Decision trees, Random forests. Time Series - Autoregressive moving average, VAR, GARCH. Clustering - K means, PAM and Hierarchical Clustering.

TOTAL: 45PERIODS

OUTCOME:
- The learner will learn to use R programming to solve decision models.

REFERENCES:

1. Jared P.L., R for Everyone - Advanced Analytics and Graphics, Addison Wesley Data and Analytics series, 2015.
2. SandipRakshit, R Programming for Beginners, McGraw Hill Education, 2017.