# 20AD41SC - DATA REPRESENTATION AND ANALYSIS USING R LABORATORY

(Common to CSE, IT, AI&DS, ECE and EEE)

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| Course Category: | Skill Oriented | Credits: | 2 |
| Course Type: | Practical | Lecture-Tutorial-Practical: | 1-0-2 |
| Prerequisite: | Basic Knowledge of Data Analysis and R Programming Fundamentals | Sessional Evaluation:  Univ. Exam Evaluation:  Total Marks: | 40  60  100 |

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| Course Objectives: | * To strengthen the ability to identify and apply the suitable R functions for the given Datasets. * To develop skills to Analyse and Visualize the Data. |
| Course outcomes | After the completion of this Course, the students will be able to Analyze and Visualize the Data. |
| Course Content | **Session-I:**Download and install R-Programming Environment and install basic packages using install.packages() command in R.  **Session-II:**Learn the R Basic Syntax, Datatypes, variables and Reserved words.  **Session-III:**Learn the operators, R statements, Loops and R functions.  **Session-IV:R objects and Manipulation on R objects:** Vector, List, Array  **Session-V:R objects and Manipulation on R objects:**Dataframe, Matrix, Factors.  **Session-VI:**Conversion of one form of object to another form, Classes and objects in R, Data Reshaping in R, R Debugging.  **Session-VII: Data Interfacing:** Reading file from Disk into R, Read CSV files into R, Using Clip Board for Making Data in R, Read the Binary files into R, Handling Missing values in R.  **Session-VIII:**CollecttheDatasetsforPerformingManipulations,Mathematical operations in R, Solving Linear Equations Using R.  **Session-IX:R Regression:** Linear Regression,Logistic Regression, Multiple Regression, Poisson Regression.  **Session-X:R Statistics:** Normal Distribution, Binominal Distribution, R classification, Time Series Analysis, R Random Forest, Hypothesis, U-test, Chi-square test in R, Analysis of Correlation and Covariance in R.  **Session-XI:Data Visualization using R:** visualization packages in R, Pie Charts, Bar Charts, Box Plots, Histograms, Line Graphs, Scatter Plots.  **Session-XII**   * Collect Dataset and Perform Statistical Analysis on the Collected data. * Collect Dataset and PerformRegression Analysis on the Collected data.   **Session-XIII**   * Collect Dataset and PerformData Visualization on the Collected data. * Collect Dataset and PerformSentiment Analysis on the Collected data. |
| Text Books &  References  Books | **TEXT BOOKS:**   1. Beginning R, the statistical programming language by Dr Mark Gardener.   **REFERENCE BOOKS:**   1. “R Programming for Beginners: Fast and Easy Learning” by Steven Keller, Kindle Edition. 2. “A Handbook of Statistical Analyses Using R” by Brian Everitt and Torsten Hothorn. 3. “R Graphics Cookbook” by Winston Chang. |
| E-Resources | 1. <https://www.rstudio.com/> 2. <https://www.w3schools.com/> 3. <https://www.r-project.org/> |