

COURSE TITLE	R PROGRAMMING
COURSE CODE	05DS0203
COURSE CREDITS	4

Course Outcomes: After completion of this course, student will be able to:

- 1 Understanding about Data analytics, its types and its applications.
- 2 Knowledge about R studio installation and R programming fundamental concepts like variable, data types, commands.
- 3 Application of the basics in R programming in terms of functions, loops, decision making and data structure.
- 4 Design various experiments based on graphs and charts for data visualization in R programming
- 5 Application of statistical computations for data analytics.

Pre-requisite of course: Basic knowledge of programming concepts

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	4	0	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	1. Introduction to Data Analysis Introduction of Syllabus, Introduction to Data Analysis: Overview of Data Analytic, Need of Data Analytics, Nature of Data, Classification of Data, Characteristics of Data, Applications of Data analytics, Applications of Data analytics, Types of Data	8
2	2. Introduction to R Programming Unit- 2: Introduction to R Programming : Overview of R programming, Features of R, Applications of R, Introduction and Installation of R Studio, Creation and Execution of R File in R Studio, Clear the Console and the Environment in R Studio, Basic Syntax in R Programming, R Commands, Variables and scope of variables, Datatypes of R programming, Operators, Keywords, Class Test – 1 (Unit – 1 & 2)	8
3	3. R Programming Basics Unit-3 R Programming Basics : How to take Input from user in R, Output in R using different functions, Decision making statements, Looping statements, Break next, return statements, Switch case, Data Structure in R: Vectors, Lists, Data frames, Matrices, Arrays	10

Contents : Unit	Topics	Contact Hours
4	4. Data Visualization using R Unit-4 Data Visualization using R, Reading and getting data into R (External Data), Using CSV files, XML files, Web Data,, JSON files,, Databases, Databases, Excel files., Histograms , Bar Charts, Line Graphs, Boxplots, Scatterplots, Pie Charts, Class Test :-2 Unit : 3 & 4	12
5	5. Statistics with R Unit-5 - Statistics with R : Mean, Median and Mode, Variance and Standard Deviation, Descriptive Analysis, Normal Distribution,, Binomial distributions, Analysis of Variance (ANOVA) Test :One Way & Two Way ANOVA,, Regression , Linear Regression, Multiple Regression, Logistic Regression, Time series Analysis , Survival Analysis	12
Total Hours		50

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	<p>PROGRAMS</p> <p>Syllabus Discussion and practical approach of the subject, Environment setuo with R Studio, Write R script for some inbuilt functions like : help(),c(),ls(),rm(),sqrt(),seq(),min(),max(),assign(),print(), Write a R program to take input from the user (name and age) and display the values. Also print the version of R installation., Write a program to use R as a calculator, Write R script to perform arithmetic and logical operations, Write a program to assign value to a variable in difference ways., Write a R program to extract first 10 English letter in lower case and last 10 letters in upper case and extract letters between 22nd to 24th letters in upper case., Write R script to create an array, passing in a vector of values and a vector of dimensions. Also provide names for each dimension., Write R script to create a 4 × 4 matrix , 3 × 3 matrix with labels and fill the matrix by rows and 2 × 2 matrix with labels and fill the matrix by columns., Write R script to create 3 x 3 matrix to perform addition, subtraction, multiplication and division operations., Write R script to print even numbers from 10 to 30 using all available loops in R., Write R script to print result as given below using decision making statements:>70 Distinction,>60 First ,>40 pass <40 Fail., Write R script to create data frame “student” with the fields of stud_id, stud_name, email_id and mobile_no. Perform following operations: a. Display data of data frame b. Display summary of data frame c. Display structure of data frame d. Extract and display only stud_name and mobile_no from data frame, Write R script to create a Dataframes which contain details of 5 employees and display the details. Create another data frame with same colums and merge it with first one., Write R script to read and write excel , Write R script to read and write csv file., Write R script to read and write XML file., Write R script to read and download Web data file., Write R script to work with JSON file., Write R script to work with Database file., Write R script to create bar chart(3 different styles preferable). , Write R script to create single and multiple Line graph (3 different styles preferable)., Write R script to create scatter plot. (3 different styles preferable)., Write R script to create pie chart(5 different styles preferable)., Write R script to create boxplot (2 different styles preferable)., Write R script to create Histogram., Write R script to calculate mean , median and mode of given data., Write R script for finding probability by using Normal distribution., Write R script for finding probability by using Binomial distribution., Write R script for Analysis of Variance (ANOVA) Test :One Way & Two Way ANOVA., Write R script for Linear and Multiple Regression., Write R script for Logistic Regression, Write R script for Time Series Analysis., Write R script for Survival Analysis., Lab Test-1</p>	40
Total Hours		40

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking