SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar
Programme & Subject : B.Sc (CA & IT) – M.Sc (CA & IT) Dual Degree
Semester - 4
PS04SIIT21 : R Programming
(w.e.f June 2019)

Credits : 2   **Exam Duration : 2hrs**
Lectures per week : 2
All units carry equal weightage.

Unit	Description in detail	Weightage
I	**Introduction to R** - History of R, Features of R, How to install R, How to run R, Comments in R, Reserved words, Identifiers, Constants, Variables - Operators: Arithmetic, Relational, Logical, Assignment, Miscellaneous, - Basic Data Types: Numeric, Integer, Complex, Logical, Character - Vectors: Creating Vectors, Combining Vectors, Accessing Vector Elements, Modifying Vectors, Deleting Vectors, Vector Arithmetic & Recycling, Vector Element Sorting, Reading Vectors	25%
II	**Data Structure in R** - Matrices: Creating Matrices, Accessing Matrix Elements, Matrix Manipulation, Matrix Operations - Arrays: Creating Arrays, Accessing Array Elements, Array Element Manipulation, Array Arithmetic - Lists: Creating Lists, Accessing List Elements, Updating List Elements, Merging Lists, List to Vector Conversion - Factors: Creating Factors, Accessing Factor Components, Merging Factors - Data Frames: Creating Data Frames, Accessing Data Frame Components, Modifying Data Frames, Aggregating Data, Sorting Data, Merging Data, Reshaping Data, Subsetting Data	25%
III	**Flow Control & Functions in R** - Decision Making: if statement, if..else statement, Nested if..else statement, switch statement, - Loops: for Loop, while Loop, repeat Loop, Loop Control Statements: break Statement, next Statement - Built-in Functions: Mathematical Functions, Character Functions, Statistical Functions, Date and Time Functions - Functions Definition, Function Calling: Function without arguments, Functions with named arguments, Function with default arguments.	25%

IV	**Connecting R to External interfaces**
	  - Packages: Installing a Package, Loading a Package
	  - Charts and Graphs: Bar Charts, Line Graph, Pie Chart, Scatter Plots, Dot Plots
	  - CSV Files: Reading from a CSV File, Writing to a CSV File
	  - Microsoft Excel: Reading from a xlsx File, Writing to xlsx File
	  - Databases: Connecting R to MySQL, Creating Tables, Inserting Rows, Updating Rows, Deleting Rows, Querying Tables, Dropping Table
		25 %

Basic Text & Reference Books:
1. R Programing for Data Science, Roger D. Peng (2015), Leanpub publisher
2. Statistics Using R Purohit, G.S., Gore, S.D. and Deshmikh, S.R. (2008), Narosa Publishing House
3. Data Analysis and Graphics Using R: An example-based approach , Maindonald J. and Braum, J. (2007) Second Edition, Cambridge Series in Statistical and Probabilistic Mathematics.
4. An R Companion to Linear Statistical Models , Hey-Jahans, C.(2012), CRC Press