School of Computer Science

SYLLABUS

III-II:CSE(CSE)								
Course Code	**Category**	**Hours/Weak**			**Credits**	**Max Marks**		
AM/DS3101PC	**Core**	**L**	**T**	**P**	**C**	**CIE**	**SEE**	**Total**
		3	**0**	**0**	**3**	**30**	**70**	**100**
Contact Classes:45	**Tutorial classes:15**	**Practical classes: Nill**				**Total Classes:60**		
Prerequisites: None								

Course Objectives

- Understanding and being able to use basic programming concepts
- Automate data analysis
- Working collaboratively and openly on code
- Knowing how to generate dynamic documents
- Being able to use a continuous test-driven development approach

Course Outcomes

- Be able to use and program in the programming language R
- Be able to use R to solve statistical problems
- Be able to implement and describe Monte Carlo the technology
- Be able to minimize and maximize functions using R

UNIT - I

Introduction: Overview of R, R data types and objects, reading and writing data, sub setting R Objects, Essentials of the R Language, Installing R, Running R, Packages in R, Calculations, Complex numbers in R, Rounding, Arithmetic, Modulo and integer quotients, Variable names and assignment, Operators, Integers, Factors, Logical operations

UNIT - II

Control structures, functions, scoping rules, dates and times, Introduction to Functions, a preview of Some Important R Data Structures, Vectors, Character

School of Computer Science

Strings, Matrices, Lists, Data Frames, Classes Vectors: Generating sequences, Vectors, and subscripts, Extracting elements of a vector using subscripts, Working with logical subscripts, Scalars, Vectors, Arrays, and Matrices, Adding and Deleting Vector Elements, Obtaining the Length of a Vector, Matrices, and Arrays as Vectors Vector Arithmetic and Logical Operations, Vector Indexing, Common Vector Operations

UNIT - III

Lists: Creating Lists, General List Operations, List Indexing Adding and Deleting List Elements, Getting the Size of a List, Extended Example: Text Concordance Accessing List Components and Values Applying Functions to Lists, DATAFRAMES, Creating Data Frames, Accessing Data Frames, Other Matrix-Like Operations

UNIT - IV

FACTORSANDTABLES, Factors and Levels, Common Functions Used with Factors, Working with Tables, Matrix/Array- Like Operations on Tables, Extracting a Sub table, Finding the Largest Cells in a Table, Math Functions, Calculating a Probability, Cumulative Sums and Products, Minima and Maxima, Calculus, Functions for Statistical Distributions

UNIT - V

OBJECT - ORIENTED PROGRAMMING: S Classes, S Generic Functions, Writing S Classes, Using Inheritance, S Classes, Writing S Classes, Implementing a Generic Function on an S Class, visualization, Simulation, code profiling, Statistical Analysis with R, data manipulation

TEXT BOOK:

1. R Programming for Data Science by Roger D. Peng
2. The Art of R Programming by Prashanth Singh, Vivek Mauryan, Cengage Learning India.