	L	T	P	
Data Analysis using R	**3**	**0**	**2**	Machine Learning

Course Objective:: In this course students will learn R. Programming language, data analytics, data visualisation and statistical model for data analytics.

S. NO	Course Outcomes (CO)
CO1	Apply R programming skills to import, clean, and prepare datasets for analysis.
CO2	Conduct exploratory data analysis (EDA) to discover patterns, trends, and relationships within the data.
CO3	Build and interpret visualizations using ggplot2 to summarize and present data insights.
CO4	Perform basic and advanced statistical analyses using R functions and packages.
CO5	Apply regression models and other predictive analysis techniques to solve real-world problems.

S. NO	Contents	Contact Hours
UNIT 1	Introduction to Data Analysis: Overview of Data Analytics, Need of Data Analytics, Nature of Data, Classification of Data: Structured, Semi-Structured, Unstructured, Characteristics of Data, Applications of Data Analytics.	**6**
UNIT 2	R Programming Basics: Overview of R programming, Environment setup with R Studio, R Commands, Variables and Data Types, Control Structures, Array, Matrix, Vectors, Factors, Functions, R packages.	**8**
UNIT 3	Data Visualization using R: Reading and getting data into R (External Data): Using CSV files, XML files, Web Data, JSON files, Databases, Excel files. Working with R Charts and Graphs: Histograms,Boxplots,Bar Charts, Line Graphs, Scatterplots, Pie Charts	**8**
UNIT 4	Statistics with R: Random Forest, Decision Tree, Normal and Binomial distributions,Time Series Analysis,Linear and Multiple Regression, Logistic Regression, Survival Analysis	**8**
UNIT 5	Prescriptive Analytics: Creating data for analytics through designed experiments,Creating data for analytics through active learning, Creating data for analytics through reinforcement learning	**8**
UNIT 6	Advanced Data Visualization: Advanced ggplot2 techniques: facets, multi-panel plots, custom color palettes. Visualizing time series data. Creating interactive plots using plotly or shiny.	**4**
	TOTAL	**42**