Panipat Institute of Engineering & Technology
Department of CSE-AI&DS
LESSON PLAN

Subject: Data Science and R Programming **Subject code: PC-CS-AIDS- 204A**

Semester: 4th

SNo	Topic	CO Covered	Assignment No.	Teaching Methodology
1	**Unit-1:** What is Data Science, What does Data Science involve	CO1	Assignment-1	Board
2	Era of Data Science, Business Intelligence vs Data Science	CO1		Board
3	Life cycle of Data Science, Tools of Data Science	CO1		Board
4	Introduction to Big Data and Hadoop, Introduction to R	CO1		Video
5	Introduction to Spark, Introduction to Machine Learning	CO1		PPT
6	Statistics: Describing a Single Set of Data, Central Tendencies	CO1		Board
7	Dispersion, Correlation, Simpson's Paradox, Some Other Correlational Caveats	CO1		Board
8	Correlation and Causation. Probability: Dependence and Independence	CO1		Board
9	Conditional Probability, Bayes's Theorem	CO1		Board
10	Random Variables, Normal Distribution, Binary distribution	CO1		Board
11	Revision of Unit-1	CO1		Flip Learning
12	**Unit-2:** R Programming, What is R, Installing R and RStudio, RStudio Overview, Working in the Console	CO2	Assignment-2	Board/ PPT
13	Writing data, Reading from csv files, Data Types	CO2		Board/ PPT
14	Operators, Functions, Vectors, Data Frames, Factors	CO2		Board/ PPT
15	Sorting Numeric, Character, and Factor Vectors, Special Values	CO2		Board/ PPT
16	Installing and loading packages, Setting up your working directory	CO2		Board/ PPT
17	Downloading and importing data, Working with missing data	CO2		Board/ PPT
18	Extracting a subset of a data frame, Writing R scripts	CO2		Board/ PPT
19	Creating reports, Flow Control, while loops, for loops, If / else	CO2		Board/ PPT

20	Debugging tools, Data Analysis Pipeline, Data Extraction	CO2		Board/ PPT
21	Types of Data, Raw and Processed, Data Wrangling	CO2		Board
22	Revision of Unit-2	CO2		Flip Learning
23	**Unit-3:** Data Manipulation in R, List Management, Data Transformation	CO3	Assignment-3	PPT
24	Merging Data Frames, Outlier Detection	CO3		Board
25	Combining multiple vectors, Logical Regression	CO3		Board
26	Hierarchical Clustering, PCA for Dimensionality Reduction	CO3		Board
27	Data Import Techniques, Exploratory Data Analysis	CO3		PPT
28	Visualization of Data, Loading different types of dataset in R	CO3		Board
29	Arranging the data, Plotting the graphs, Statistical graphs	CO3		Board
30	Creating bar chart and dot plot, Creating histogram and box plot	CO3		Board
31	Plotting with base graphics, Plotting and coloring in R	CO3		PPT
32	Revision of Unit-3	CO3		Flip Learning
33	**Unit-4:** Machine Learning using R: Modeling	CO4	Assignment-4	PPT
34	Linear Regression	CO4		Board
35	Logistic Regression	CO4		Board
36	K-Means, K-Means++	CO4		Board
37	Hierarchical Clustering – Agglomerative	CO4		PPT
38	CART, Random forest	CO4		Board
39	Naïve Bayes,	CO4		Board
40	Implementing Support Vector Machine in R	CO4		Board
41	Revision of Unit-4	CO4		Flip Learning