

Unit 1.

Introduction Data Science, Data and Big data, Predictive Analysis, Machine Learning, Data Mining, Soft computing, Neural Network, Deep learning; Introduction to Machine learning: Machine Learning Basics, how machines learn, Machine learning in practice, Types of Machine Learning

Unit 2.

An introduction to linear algebra, vector, matrix, Elementary operations of Matrices, general numerical approach to solving systems of equations, Matrices approach to solving systems of equations,

Unit 3.

R programming installation, Introduction to R programming, functions, classes, packages, libraries, data types, operators, Mathematics in R and Data manipulation

Unit 4.

Statistics, Population and Sample, Types of measurements / Data, Variables, Categorical and Quantitative Variables, Branches of Statistics, Descriptive Statistics, Inferential Statistics, Exercises and applications, Measures of Central Tendency, Measures of Central Tendency

Unit 5.

Regression Analysis Understanding Regression, Simple linear Regression, Multiple Regression, Logistic Regression.

Unit 6.

Decision Tree Classification Using Decision Trees and Rule, Understanding decision trees (Divide and conquer, C5.0 Decision Tree Algorithm)



Unit 7.

Random Forest (Ensemble Modelling), Bagging, Boosting, Tree based modeling

Unit 8.

K-Nearest Neighbors Classifiers Classification using K-Nearest Neighbors, Understanding Nearest Neighbors classification

Unit 9.

Clustering algorithms, k-means Clustering, Clustering as the machine learning task and Hierarchical clustering

Unit 10.

Model Selection Applying Machine Learning, Model Selection, Train/Test/Validation sets, and Learning curves

Unit 11.

Evaluation Metrics for Regression and classification algorithms.

Unit 12.

Support Vector Machines, Naïve Bayes Classification (Advanced Machine Learning)

Unit 13.

Neural Networks (Deep Learning Basics) – R (Advanced machine learning)

