# DATA ANALYTICS (4-0-0)

**Module I:**

**Predictive Analytics1.Linear Methods for Regression and Classification:** Overview of supervised learning, Linear regression models and least squares, Multiple regression, Multiple outputs, Subset selection , Ridge regression, Lasso regression , Linear Discriminant Analysis , Logistic regression , Perceptron learning algorithm.

**Module II:**

Neural Networks(NN) , Support Vector Machines(SVM),and K-nearest Neighbor: Fitting neural networks, Back propagation, Issues in training NN, SVM for classification, Reproducing Kernels, SVM for regression, K-nearest – Neighbour classifiers( Image Scene Classification).

**Module III:**

**Unsupervised Learning and Random forests:** Association rules, Cluster analysis, Principal Components, Random forests and analysis.

**Module IV:**

## Inferential Statistics and Prescriptive analytics

Assessing Performance of a classification Algorithm( t-test, McNemar's test, Paired t-test, paired Ftest),
Analysis of Variance, Creating data for analytics through designed experiments.
Introduction to big data and Challenges for big data analytics.

**Recommended Texts**:

1.Trevor Hastie, Robert Tibshirani, Jerome Friedman *, The Elements of Statistical Learning-Data Mining, Inference, and Prediction*, Second Edition , Springer Verlag, 2009.
[ chapters: 2,3(3.1-3.4,3.6),4(4.3-4.5),11(11.3-11.6),12(12.1-12.3),13.3,14(14.1-14.3.8,14.5.1),15]

2. **( For unit 5 only**) -G.James, D.Witten, T. Hastie, R. Tibshirani-*An introduction to statistical learning with applications in R*,Springer,2013.(2.3,3.6.1-3.6.3,4.6.1-4.6.3,5.3,6.6.1,8.3.1,8.3.2,10.4,10.5.1)

3 ( **for unit 4 only**).E. Alpaydin*, Introduction to Machine Learning*, Prentice Hall Of India,2010,(Chapter-19)

**References**

1.C.M.Bishop –Pattern Recognition and Machine Learning,Springer,2006
2. L. Wasserman-All of statistics

**Texts 1 and 2 and reference 2 are available on line.**