Lesson Plan

Machine Learning

Paper Code: ML 407T **L** **P** **C**

Subject:Machine Learning **3**   **3**

S.No.	Topics Details	Total Lectures
1	**UNIT-I**: Machine learning, terminologies in machine learning	1
2	Perspectives and issues in machine learning	1
3	Application of ML	1
4	Types of machine learning: supervised, unsupervised, semi-supervised learning	2
5	Review of probability, Basic Linear Algebra in Machine Learning Techniques	1
6	Dataset and its types, data preprocessing	1
7	Bias and Variance in Machine learning	1
8	Function approximation	1
9	Overfitting	1
10	**UNIT-II**: Introduction to regression and its terminologies, Types of regression, Logistic Regression	2
11	Introduction to Simple Linear Regression and its assumption, Simple Linear Regression Model Building, Ordinary Least square estimation	1
12	Properties of the least-squares estimators and the fitted regression model	1
13	Interval estimation in simple linear regression, Residuals	1
14	Multiple linear regression model and its assumption	1

15	Interpret Multiple Linear Regression Output(R-Square, Standard error, F, Significance F, Cofficient P values)	2
16	Access the fit of multiple linear regression model (R squared, Standard error)	1
17	Feature Selection and Dimensionality Reduction: PCA, LDA, ICA	1
18	**UNIT-III**: What is Classification? General Approach to Classification, k-Nearest Neighbor Algorithm, Random Forests, Fuzzy Set Approaches	1
19	Support Vector Machine: Introduction, Types of support vector kernel ‗(Linear kernel, polynomial kernel, and Gaussiankernel), Hyperplane ‗(Decision surface), Properties of SVM, and Issues in SVM.	1
20	Decision Trees: Decision tree learning algorithm, ID-3algorithm, Inductive bias, Entropy and information theory, Information gain,Issues in Decision tree learning	2
21	Bayesian Learning - Bayes theorem, Concept learning, Bayes Optimal Classifier, Naïve Bayes classifier, Bayesian belief networks, EM algorithm	2
22	Ensemble Methods: Bagging, Boosting and AdaBoost and XBoost	1
23	Classification Model Evaluation and Selection: Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value, Lift Curves and Gain Curves	1
24	ROC Curves, Misclassification Cost Adjustment to Reflect Real- World Concerns, Decision Cost/Benefit Analysis	2
25	**UNIT-IV** - The Clustering Task and the Requirements for Cluster Analysis	1
26	Overview of Some Basic Clustering Methods:-k-Means Clustering, k-Medoids Clustering	1
27	Density-Based Clustering: DBSCAN - Density-Based Clustering Based on Connected Regions with High Density,	1
28	Gaussian Mixture Model algorithm	1
29	Balance Iterative Reducing and Clustering using Hierarchies (BIRCH)	1

30	Affinity Propagation clustering algorithm	1
31	Mean-Shift clustering algorithm, ordering Points to Identify the Clustering Structure (OPTICS) algorithm	2
32	Agglomerative Hierarchy clustering algorithm	1
33	Divisive Hierarchical , Measuring Clustering Goodness	1