

ST. ANN'S COLLEGE OF ENGINEERING & TECHNOLOGY: CHIRALA
DEPARTMENT OF COMPUTERS SCIENCE & ENGINEERING
LESSON PLAN

Subject: MACHINE LEARNING
Name: PHANI LALITHENRA N
No. of Lectures per week : 4 +1

Academic Year: 2019-20
Year & Sem/Section: IV-II SEM 'C'

S.No.	Sub Topic Names	No. of Classes required
Unit/Topic No.		
I	The ingredients of machine learning, Tasks: the problems that can be solved with machine learning, Models: the output of machine learning, Features, the workhorses of machine learning. Binary classification and related tasks: Classification, Scoring and ranking, Class probability estimation	12
II	Beyond binary classification: Handling more than two classes, Regression, Unsupervised and descriptive learning. Concept learning: The hypothesis space, Paths through the hypothesis space, Beyond conjunctive concepts	9
III	Tree models: Decision trees, Ranking and probability estimation trees, Tree learning as variance reduction. Rule models: Learning ordered rule lists, Learning unordered rule sets, Descriptive rule learning, First-order rule learning	8
IV	Linear models: The least-squares method, The perceptron: a heuristic learning algorithm for linear classifiers, Support vector machines, obtaining probabilities from linear classifiers, Going beyond linearity with kernel methods. Distance Based Models: Introduction, Neighbours and exemplars, Nearest Neighbours classification, Distance Based Clustering, Hierarchical Clustering	11
V	Probabilistic models: The normal distribution and its geometric interpretations, Probabilistic models for categorical data, Discriminative learning by optimising conditional likelihood Probabilistic models with hidden variables. Features: Kinds of feature, Feature transformations, Feature construction and selection. Model ensembles: Bagging and random forests, Boosting	10
VI	Dimensionality Reduction: Principal Component Analysis (PCA), Implementation and demonstration. Artificial Neural Networks: Introduction, Neural network representation, appropriate problems for neural network learning, Multilayer networks and the back propagation algorithm.	7
Total No. of hours		57

Text Books

1	Machine Learning: The art and science of algorithms that make sense of data, Peter Flach, Cambridge.
2	Machine Learning, Tom M. Mitchell, MGH

References

1	Understanding Machine Learning: From Theory to Algorithms, Shai Shalev-Shwartz, Shai Cambridge
2	Machine Learning in Action, Peter Harington, 2012, Cengage.

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