



BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE (A)
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
BR25 M.TECH CSE COURSE STRUCTURE AND SYLLABUS

II Semester	MACHINE LEARNING (D252BA01)	L	T	P	C
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Course Objectives:

The objectives of the course are to

- Define machine learning and its different types (supervised and unsupervised) and understand their applications.
- Apply supervised learning algorithms including decision trees and k-nearest neighbours (k-NN).
- Implement unsupervised learning techniques, such as K-means clustering.

Course Outcomes: At the end of the course, student will be able to (Four to Six)

		Knowledge Level(K)#
CO1	Enumerate the Fundamentals of Machine Learning	K2
CO2	Build Nearest Neighbour based models	K2
CO3	Apply Models based on decision trees and Bayes rule	K4
CO4	Choose appropriate clustering technique	K2

Based on suggested Revised BTL

Mapping of course outcomes with program outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2		3	3		
CO2	2		3	3	2	2
CO3	2		3	3	2	2
CO4	3		3	3	2	3

(Please fill the above with Levels of Correlation, viz., L, M, H)

Dr.N.Rama Krishnaiah, Professor of CSE,UCEK & Control of Examination JNTUK, Kakinada.	Dr.C.Krishna Mohan, Professor of CSE,IIT, Kandi, Hyderabad.	Dr.P.Radha Krishna, Professor of CWQSE,NI T, Warangal.	Mr.Rajesh Bobburi Chief Operating Officer, HighQ Labs Private Limited, Rajahmundry	Dr.Lakshmi Haritha Medida, Associate Professor, R.M.K.Engineering College,Kavaraipettai,Tamilnadu	Dr.K.Srinivas, Professor & HoD Department of CSE, B.V.C.I.T.S, Batlapalem
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UNIT	CONTENTS	Contact Hours
UNIT-1	Introduction to Machine Learning: Evolution of Machine Learning, Paradigms for ML, Learning by Rote, Learning by Induction, Reinforcement Learning, Types of Data, Matching, Stages in Machine Learning, Data Acquisition, Feature Engineering, Data Representation, Model Selection, Model Learning, Model Evaluation, Model Prediction, Search and Learning, Data Sets.	10Hrs
UNIT-2	Nearest Neighbor-Based Models: Introduction to Proximity Measures, Distance Measures, Non-Metric Similarity Functions, Proximity Between Binary Patterns, Different Classification Algorithms Based on the Distance Measures, K-Nearest Neighbor Classifier, Radius Distance Nearest Neighbor Algorithm, KNR Regression, Performance of Classifiers, Performance of Regression Algorithms	12Hrs
UNIT-3	Models Based on Decision Trees: Decision Trees for Classification, Impurity Measures, Properties, Regression Based on Decision Trees, Bias-Variance Trade-off, Random Forests for Classification and Regression The Bayes Classifier: Introduction to the Bayes Classifier, Bayes' Rule and Inference, The Bayes Classifier and its Optimality, Multi-Class Classification Class Conditional Independence and Naïve Bayes Classifier(NBC)	12Hrs

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UNIT-4	: Linear Discriminants for Machine Learning: Introduction to Linear Discriminants, Linear Discriminants for Classification, Perceptron Classifier, Perceptron Learning Algorithm, Support Vector Machines, Linearly Non-Separable Case, Non-linear SVM, Kernel Trick, Logistic Regression, Linear Regression, Multi-Layer Perceptron's (MLPs), Back propagation for Training an MLP	12Hrs
UNIT-5	Clustering : Introduction to Clustering, Partitioning of Data, Matrix Factorization, Clustering of Patterns, Divisive Clustering, Agglomerative Clustering, Partitional Clustering, K-Means Clustering, Soft Partitioning, Soft Clustering, Fuzzy C-Means Clustering, Rough Clustering, Rough K-Means Clustering Algorithm, Expectation Maximization-Based Clustering, Spectral Clustering	12Hrs
Total		58Hrs

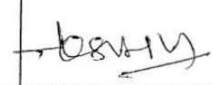
*Note:

Text Books:

1. "Machine Learning Theory and Practice", MN Murthy, V S Ananthanarayana, Universities Press (India), 2024

Reference Books:

1. Machine Learning", Tom M. Mitchell, McGraw-Hill Publication, 2017
2. "Machine Learning in Action", Peter Harrington, Dream Tech
3. "Introduction to Data Mining", Pang-Ning Tan, Michel Steinbach, Vipin Kumar, 7th Edition, 2019.

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