SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada
Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF INFORMATION TECHNOLOGY
TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Periods /Week	Academic Year	Date of commencement
23CD5T01	Machine Learning	V	CSE(DS)	5	2025-2026	09-07-2025

COURSE OUTCOMES

1	Examine the Fundamentals of Machine Learning (K1)
2	Construct Nearest neighbor-based models (K3)
3	Distinguish Models based on decision trees and Bayes rule (K2)
4	Make use of Linear discriminants for machine Learning (K3)
5	Choose appropriate clustering technique (K3)

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Ref	Contact Hour	Delivery Method
I	CO – 1		**INTRODUCTION TO MACHINE LEARNING**			
		1.1	Evolution of Machine Learning	T1, R1	1	Chalk & Board; Power point presentations; Video Lecture; E-Learning through NPTEL; Assignment; Test
		1.2	Paradigms for ML	T1, R1	1	
		1.3	Learning by Rote, Learning by Induction	T1, R1	1	
		1.4	Reinforcement Learning	T1, R1	1	
		1.5	Types of Data	T1, R1	1	
		1.6	Matching	T1, R1	1	
		1.7	Stages in Machine Learning	T1, R1	1	
		1.8	Data Acquisition	T1, R1	1	
		1.9	Feature Engineering	T1, R1	1	
		1.10	Data Representation	T1, R1	1	
		1.11	Model Selection, Model Learning	T1, R1	1	
		1.12	Model Evaluation, Model Prediction	T1, R1	1	
		1.13	Search and Learning, Data Sets	T1, R1	1	
Content beyond syllabus		**1.14**	**Federated Learning**	T1, R2	1	
				Total	**14**	
II	CO – 2		**NEAREST NEIGHBOR-BASED MODELS**			
		2.1	Introduction to Proximity Measures, Distance Measures	T1, T2	1	Chalk & Board; Power point presentations; Video Lecture; E-Learning through NPTEL; Assignment; Test
		2.2	Non-Metric Similarity Functions	T1, T2	1	
		2.3	Proximity Between Binary Patterns Estimation	T1, T2	1	
		2.4	Different Classification Algorithms Based on the Distance Measures	T1, T2	1	
		2.5	K-Nearest Neighbor Classifier	T1, T2	1	
		2.6	Radius Distance Nearest Neighbor Algorithm	T1, T2	1	
		2.7	KNN Regression	T1, T2	1	
		2.8	Performance of Classifiers	T1, T2	1	
		2.9	Performance of Regression Algorithms	T1, T2	1	
Content beyond syllabus		**2.10**	**Hybrid Distance Models**	T1, T2	1	

		MODELS BASED ON DECISION TREES		**Total**		**10**
		3.1	Decision Trees for Classification	T1, T2	1	Chalk & Board; Power point presentations; Video Lecture; E-Learning through NPTEL; Assignment; Test
		3.2	Impurity Measures, Properties	T1, T2	1	
		3.3	Regression Based on Decision Trees	T1, T2	1	
		3.4	Bias–Variance Trade-off	T1, T2	1	
		3.5	Random Forests for Classification and Regression	T1, T2	1	
III	CO – 3	**THE BAYES CLASSIFIER**				
		3.6	Introduction to the Bayes Classifier	T1, T2	1	
		3.7	Bayes' Rule and Inference	T1, T2	1	
		3.8	The Bayes Classifier and its Optimality	T1, T2	1	
		3.9	Multi-Class Classification	T1, T2	1	
		3.10	Class Conditional Independence	T1, T2	1	
		3.11	Naive Bayes Classifier (NBC)	T1, T2	1	
Content beyond syllabus		**3.12**	**Cost – Sensitive Decision Trees**	T1, R1	1	
				Total		**12**
		LINEAR DISCRIMINANATS FOR MACHINE LEARNING				Chalk & Board; Power point presentations; Video Lecture; E-Learning through NPTEL; Assignment; Test
		4.1	Introduction to Linear Discriminants	T1, T2	1	
		4.2	Linear Discriminants for Classification	T1, T2	1	
		4.3	Perceptron Classifier	T1, T2	1	
		4.4	Perceptron Learning Algorithm	T1, T2	1	
		4.5	Support Vector Machines	T1, T2	1	
IV	CO – 4	4.6	Linearly Non-Separable Case	T1, T2	1	
		4.7	Non-linear SVM	T1, T2	1	
		4.8	Kernel Trick	T1, T2	1	
		4.9	Logistic Regression	T1, T2	1	
		4.10	Linear Regression	T1, T2	1	
		4.11	Multi-Layer Perceptrons (MLPs)	T1, T2	1	
		4.12	Backpropagation for Training an MLP	T1, T2	1	
Content beyond syllabus		**4.13**	**Principal Component Analysis (PCA)**	T1, R2	1	
				Total		**13**
		CLUSTERING				Chalk & Board; Power point presentations; Video Lecture; E-Learning through NPTEL; Assignment
		5.1	Introduction to Clustering	T1, T2	1	
		5.2	Partitioning of Data	T1, T2	1	
		5.3	Matrix Factorization	T1, T2	1	
		5.4	Clustering of Patterns	T1, T2	1	
		5.5	Divisive Clustering	T1, T2	1	
V	CO – 5	5.6	Agglomerative Clustering	T1, T2	1	
		5.7	Partitional Clustering	T1, T2	1	
		5.8	K-Means Clustering	T1, T2	1	
		5.9	Soft Partitioning	T1, T2	1	
		5.10	Soft Clustering, Fuzzy C-Means Clustering	T1, T2	1	
		5.11	Rough Clustering, Rough K-Means Clustering	T1, T2	1	
		5.12	Expectation Maximization-Based Clustering	T1, T2	1	
		5.13	Spectral Clustering	T1, T2	1	

Subject : Code :

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Content beyond syllabus	5.14	Density- Based Clustering (DBSCAN)	T1, R1	1	Test
			Total		14
			Cumulative Proposed Periods		63

Text Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	M N Murthy, V S Ananthanarayana, "Machine Learning Theory and Practice", Universities Press (India), 2024
2	Tom M. Mitchell, "Machine Learning", McGraw-Hill Publication, 2017

Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
1	Peter Harrington, "Machine Learning in Action", Dream Tech.
2	Pang-Ning Tan, Michel Stenbach, Vipin Kumar, "Introduction to Data Mining Practices", 7th Edition, 2019.

Web Details:

1	https://nptel.ac.in/courses/106106139
2	https://www.tutorialspoint.com/machine_learning/index.htm
3	https://www.geeksforgeeks.org/machine-learning/machine-learning/
4	https://en.wikipedia.org/wiki/Machine_learning

		Name	Signature with Date
i.	Faculty	Mr. K V V Nagendra Babu	
ii.	Module Coordinator	Mr. KV V Nagendra Babu	
iii.	Programme Coordinator	Dr. R V V S V Prasad	

Principal