



**SWARNANDHRA  
COLLEGE OF ENGINEERING & TECHNOLOGY  
(AUTONOMOUS)**

Seetharamapuram, NARASAPUR – Pin: 534 280

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

**LESSON PLAN**

Course Code	Course Title	Semester	Branches	Conduct Periods /Week	A.Y	Date of commencement of Semester
20AD5T01	Machine learning	V	AI&DS	5	2024-25	03-06-2024

**COURSE OUTCOMES**

1	<b>CO1:</b> Explain the fundamental usage of the concept Machine Learning [K2]
2	<b>CO2:</b> Demonstrate on various regressions Technique.[K3]
3	<b>CO3:</b> Analyze the Ensemble Learning Methods.[K4]
4	<b>CO4:</b> Illustrate the Clustering Techniques and Dimensionality Reduction Models in Machine Learning.[K3]
5	<b>CO5:</b> Discuss the Neural Network Models and Fundamentals concepts of Deep Learning.[K2]

UNIT	Out Comes/ BTKL	Topic No.	Topics/Activity	Text Book / Reference	Conduct Hour	Delivery Method	
I	CO1: Explain the need for unconventional machine learning processes and its classification. [K2]	<b>1. INTRODUCTION</b>					Chalk, Talk, & Tutorials
		1.1	Artificial Intelligence	T <sub>1</sub> & T <sub>2</sub>	1		
		1.2	Machine Learning	T <sub>1</sub> & T <sub>2</sub>	1		
		1.3	Deep learning	T <sub>1</sub>	1		
		1.4	Types of Machine Learning Systems	T <sub>1</sub> & R <sub>1</sub>	1		
		1.5	Main Challenges of Machine Learning	T <sub>1</sub> & R <sub>1</sub>	1		
		1.6	<b>Statistical Learning</b>	T <sub>2</sub> & R <sub>1</sub>	1		
		1.7	Introduction	T <sub>1</sub> & T <sub>2</sub>	1		
		1.8	Supervised and Unsupervised Learning	T <sub>2</sub> & R <sub>1</sub>	1		
		1.9	Training and Test Loss	T <sub>1</sub>	1		
		1.10	Tradeoffs in Statistical Learning	T <sub>1</sub>			



		1.11	Estimating Risk Statistics	T1	1		
		1.12	Sampling distribution of an estimator	T2	1		
		1.13	Empirical Risk Minimization	T <sub>1</sub> & T <sub>2</sub>	1		
			Assignment 1		1		
					<b>Total</b>	<b>14</b>	
<b>II</b>	CO2: Demonstrate on various regressions Technique.[K3]	<b>2. Supervised Learning(Regression/Classification):</b>					
		2.1	Basic Methods: Distance based Methods	T <sub>1</sub> & T <sub>2</sub>	1	Chalk, Talk, & PDF	
		2.2	Nearest Neighbours	T <sub>1</sub> & R <sub>1</sub>	1		
		2.3	Decision Trees	T <sub>1</sub> & R <sub>1</sub>	1		
		2.4	Naive Bayes	T <sub>1</sub> & R <sub>1</sub>	1		
		2.5	Linear Models: Linear Regression	T <sub>1</sub> & R <sub>1</sub>	1		
		2.6	Logistic Regression	T <sub>1</sub> & R <sub>1</sub>	1		
		2.7	Generalized Linear Models	T <sub>1</sub> & R <sub>1</sub>	1		
		2.8	Support Vector Machines	T1&T2	1		
		2.9	Binary Classification	T1&T2	1		
		2.10	Multiclass/Structured outputs	T1&T2	1		
		2.11	MNIST	T1&T2	1		
		2.12	Ranking	T1&T2	1		
			Assignment 2		1		
					<b>Total</b>	<b>13</b>	
	CO3: Analyze the Ensemble Learning Methods.[K4]	<b>3. Ensemble Learning and Random Forests:</b>					
		3.1	Introduction	T <sub>2</sub> & R <sub>1</sub>	1	Chalk, Talk & PPT	
		3.2	Voting Classifiers	T <sub>2</sub> & R <sub>1</sub>	1		
		3.3	Bagging and Pasting	T <sub>1</sub> & T <sub>2</sub>	1		
		3.4	Random Forests	T <sub>1</sub> & T <sub>2</sub>	1		
		3.5	Boosting, Stacking	T <sub>1</sub> & T <sub>2</sub>	1		
		3.6	Support Vector Machine	T <sub>1</sub> & T <sub>2</sub>	1		
		3.7	Linear SVM Classification	T <sub>1</sub> & T <sub>2</sub>			
		3.8	Nonlinear SVM Classification	T <sub>1</sub> & T <sub>2</sub>	1		
		3.9	SVM Regression.	T <sub>1</sub> & T <sub>2</sub>	1		





		3.10	Naïve Bayes Classifiers	T <sub>1</sub> & T <sub>2</sub>	1		
			Assignment 3		1		
					<b>Total</b>	<b>11</b>	
<b>IV</b>	CO4: Illustrate the Clustering Techniques and Dimensionality Reduction Models in Machine Learning.	<b>4. Unsupervised Learning Techniques:</b>					
		4.1	Clustering	T <sub>1</sub> & T <sub>2</sub>	1	Chalk, Talk, & Tutorials,	
		4.2	K-Means, Limits of K-Means	T <sub>1</sub> & T <sub>2</sub>	1		
		4.3	Using Clustering for Image Segmentation	T <sub>1</sub> & T <sub>2</sub>	1		
		4.4	Using Clustering for Preprocessing	T <sub>2</sub> & R <sub>1</sub>	1		
		4.5	Using Clustering for Semi-Supervised Learning	T <sub>1</sub> & R <sub>1</sub>	1		
		4.6	DBSCAN	T <sub>1</sub> & T <sub>2</sub>	1		
		4.7	Gaussian Mixtures	T <sub>1</sub> & T <sub>2</sub>	1		
		4.8	Dimensionality Reduction: The Curse of Dimensionality	T <sub>1</sub> & R <sub>1</sub>	1		
		4.9	Main Approaches for Dimensionality Reduction	T <sub>1</sub> & T <sub>2</sub>	1		
		4.10	PCA	T <sub>1</sub> & T <sub>2</sub>	1		
		4.11	Using Scikit-Learn	T <sub>1</sub> & T <sub>2</sub>	1		
		4.12	Randomized PCA	T <sub>1</sub> & R <sub>1</sub>	1		
		4.13	Kernel PCA	T <sub>1</sub> & T <sub>2</sub>	1		
			Assignment 4		1		
	<b>C.B.S-2</b>		<b>Hands-on Labs and Practical Sessions</b>		1		
					<b>15</b>		
<b>V</b>	CO5: Discuss the Neural Network Models and Fundamentals concepts of Deep Learning. [K2]	<b>5. Neural Networks and Deep Learning:</b>					
		5.1	Introduction to Artificial Neural Networks with Keras	T <sub>1</sub> & T <sub>2</sub>	1	Chalk, Talk, & Tutorials	
		5.2	Implementing MLPs with Keras	T <sub>1</sub> & T <sub>2</sub>	1		
		5.3	Implementing MLPs with Keras	T <sub>1</sub> & T <sub>2</sub>	1		
		5.4	Installing Tensor Flow 2	T <sub>1</sub> & T <sub>2</sub>	1		
		5.5	Installing Tensor Flow 2	T <sub>1</sub> & T <sub>2</sub>	1		
		5.6	Loading and Preprocessing Data with Tensor Flow	T <sub>1</sub> & T <sub>2</sub>	1		
		5.7	Loading and Preprocessing Data with Tensor Flow	T <sub>1</sub> & T <sub>2</sub>	1		
			Assignment 5		1		
					<b>Total</b>	<b>08</b>	



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**Cumulative Proposed Periods**

**61**

Where : **C.B.S** = Content Beyond the Syllabus

**Text Books:**

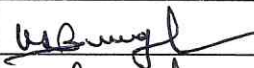
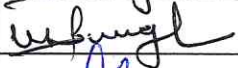


S.No	Authors, Book Title, Edition, Publisher, Year of Publication
T1	Dirk P. Kroese, Zdravko I. Botev, Thomas Taimre, Radislav Vaisman” Data Science and Machine Learning Mathematical and Statistical Methods” 25th November 2020
T2	<b>Aurélien Géron</b> ”Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow”, 2nd Edition, O’Reilly Publications, 2019.

**Reference Books:**

S.No.	Authors, Book Title, Edition, Publisher, Year of Publication
R1	Kevin P. Murphy, “Machine Learning Probabilistic Approach”, MIT Press, 2012.

**Web Details**

W1	<a href="https://www.ibm.com/topics/machine-learning">https://www.ibm.com/topics/machine-learning</a>
W2	<a href="https://www.geeksforgeeks.org/machine-learning/">https://www.geeksforgeeks.org/machine-learning/</a>
W3	<a href="https://www.coursera.org/learn/machine-learning">https://www.coursera.org/learn/machine-learning</a>
W4	<a href="https://www.w3schools.com/python/python_ml_getting_started.asp">https://www.w3schools.com/python/python_ml_getting_started.asp</a>

S.NO.	Details	Name	Signature
i.	Faculty	Mr. V DURGA RAO	
ii.	Course Coordinator	Mr. V DURGA RAO	
iii.	Module Coordinator	Dr. G. SUDHAKAR	
iv.	Program Coordinator	Dr. B. RAMA KRISHNA	

  
**Principal**