

Course code	Course Title	L	T	P	C
BCSE209P	Machine Learning Lab	0	0	2	1
Pre-requisite	NIL	Syllabus version			
		1.0			
Course Objectives					
1. To teach the theoretical foundations of various learning algorithms.					
2. To train the students better understand the context of supervised and unsupervised learning through real-life examples.					
3. To understand the need for Reinforcement learning in real – time problems.					
4. Apply all learning algorithms over appropriate real-time dataset.					
5. Evaluate the algorithms based on corresponding metrics identified.					
Course Outcome					
At the end of this course, student will be able to:					
1. Understand, visualize, analyze and preprocess the data from a real-time source.					
2. Apply appropriate algorithm to the data.					
3. Analyze the results of algorithm and convert to appropriate information required for the real – time application.					
4. Evaluate the performance of various algorithms that could be applied to the data and to suggest most relevant algorithm according to the environment.					
Indicative Experiments					
1.	Linear & Multiple Linear Regression	2 hours			
2.	Naïve Bayes classifier	2 hours			
3.	Decision trees – ID3 & CART	4 hours			
4.	Logistic regression	2 hours			
5.	Support Vector Machines – Linear & Non-linear	2 hours			
6.	Single & Multi-layer Perceptron	4 hours			
7.	K-NN, K-Means & K-mode clustering	2 hours			
8.	Random – forest	2 hours			
9.	Adaboost, XGboost	4 hours			
10.	Principal component analysis	2 hours			
11.	Self – Organizing maps	2 hours			
12.	Q-Learning	2 hours			
Total Laboratory Hours					30 hours
Text Book(s)					
1	Ethem Alpaydin,"Introduction to Machine Learning", MIT Press, Prentice Hall of India, Third Edition 2014.				
2	Reinforcement Learning: An Introduction (Adaptive Computation and Machine Learning series) 2 nd edition, Richard S. Sutton and Andrew G. Barto, A Bradford Book; 2018, ISBN 978-0262039246				
References Books:					
1	Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar "Foundations of Machine Learning", MIT Press, 2012.				
2	Tom Mitchell, "Machine Learning", McGraw Hill, 3rd Edition,1997.				
3	Charu C. Aggarwal, "Data Classification Algorithms and Applications" , CRC Press, 2014.				
Mode of Evaluation: CAT / Mid-Term Lab/ FAT					

Recommended by Board of Studies	09-05-2022		
Approved by Academic Council	No. 66	Date	16-06-2022