Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NMCC502	Fundamentals of Machine Learning	3	1	0	4

Course Objective
• To provide exposure to theory application of Machine Learning Techniques
Learning Outcomes
• This course will provide the students an exposure about how to use machine learning techniques in Data Analytics.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1.	Classification/Regression techniques such as Naive Bayes', decision trees, SVMs	8L+3T	This unit will help students to understand different classification techniques like: Naive Bayes', decision trees, SVMs.
2.	Boosting/Bagging and linear and non-linear regression, logistic regression, maximum likelihood estimates, regularization, basics of statistical learning theory	9L+3T	This unit will help students to understand the application of different regression techniques in Machine Learning.
3.	Perceptron rule, multi-layer perceptron, Back propagation, brief introduction to deep learning models.	8L+3T	This unit will help students to get the concept of supervised learning like: ANN and their different application in classification, prediction and other areas of Machine Learning. Further application of different Markov models will be illustrated.
4.	Markov model, hidden Markov model and their applications Dimensionality reduction techniques like PCA, ICA and LDA.	10L+2T	This unit will help students to get the concept of different dimensionality reduction techniques which will be useful for Big data analysis.
5.	Unsupervised learning: Clustering, Gaussian mixture models, Some case studies	7L+3T	This unit will help students to get the concept of different unsupervised learning.
Total		**42L+14T**	

Text Books:

1. James, Gareth, Witten, Daniela, Hastie, Trevor, Tibshirani, Robert, , An introduction to statistical learning: with applications in R, New York : Springer, 2013.
2. Andreas C. Müller and Sarah Guido, Introduction to Machine Learning with Python: A Guide for Data Scientists.

Reference Books:

1. Kevin Murphy, Machine Learning: A Probabilistic Perspective (MLAPP), MIT Press, 2012
2. Christopher Bishop, Pattern Recognition and Machine Learning (PRML), Springer, 2007.