Course Type	Course Code	Name of Course	L	T	P	Credit
DC	**NMCC508**	Neural Networks and Deep Learning	3	1	0	4

Course Objective
• All Data Analytics applications are depended on Neural Network and Deep Learning.
Learning Outcomes
• This course will provide the students an exposure about how to use Neural Network and Deep Learning in Data Analytics.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Introduction: Various paradigms of earning problems, Perspectives and Issues in deep learning framework, review of fundamental learning techniques.	8L+3T	This unit will help students to understand deep learning.
2	Feedforward neural network: Artificial Neural Network, activation function, multi-layer neural network.	8L+3T	This unit will help students to understand the concept of ANN.
3	Training Neural Network: Risk minimization, loss function, backpropagation, regularization, model selection, and optimization. Conditional Random Fields: Linear chain, partition function, Markov network, Belief propagation, Training CRFs, Hidden Markov Model, Entropy.	10L+2T	This unit will help students to get the concept different training methods of ANN.
4	Deep Learning: Deep Feed Forward network, regularizations, training deep models, dropouts, Convolutional Neural Network, Recurrent Neural Network, Deep Belief Network.	8L+3T	This unit will help students to get the concept of different Deep Learning techniques.
5	Probabilistic Neural Network: Hopfield Net, Boltzman machine, RBMs, Sigmoid net, Autoencoders. Deep Learning research: Object recognition, sparse coding, computer vision, natural language processing. Deep Learning Tools: Caffe, Theano, Torch.	8L+3T	This unit will help students to get the concept of different types of ANN.
Total		**42L+14T**	

Text Books:

1. M. Nielsen, Neural Networks and Deep Learning, Determination Press, 2015

Reference Books:

1. Charu C. Aggarwal, Neural Networks and Deep Learning: A Textbook, Springer, 2018