

1.	Title of the Course	Artificial Neural Networks
2.	Course Number	CS5222
3.	Status of the Course	Elective
4.	Structure of Credits	2-0-0-2
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Computer Science and Engineering
8.	To take effect from	January 2020
9.	Prerequisite	CoT
10.	Whether approved by the Department	Yes
11.	Course Objective: To impart knowledge on design and development of artificial neural networks (ANN). To provide an understanding of mathematical modeling in ANNs for pattern recognition problems.	
12.	Course Content: Background to artificial neural networks (ANN) and parallel and distributed processing (PDP), PDP models, basics of ANN including terminology, topology and learning laws; Analysis of Feed-Forward Neural Networks (FFNN) including linear associative networks, perceptron network, multilayer perceptron, gradient descent methods and backpropagation learning; Analysis of Feedback Neural Networks (FBNN) including Hopfield model, state transition diagram, stochastic networks, Boltzmann learning law; Evolution of ANN architectures - from learning to deep learning.	
13.	Text book(s): 1. Rumelhart D E and McClelland J L, <i>Parallel and Distributed Processing: Explorations in Microstructure of Cognition</i> , Vol. 2, MIT Press (1986). 2. Yegnanarayana B, <i>Artificial Neural Networks</i> , Prentice-Hall India (1999).	
14.	Reference(s): 1. Goodfellow I, Bengio Y and Courville A, <i>Deep Learning</i> , MIT Press (2017). 2. Haykin S, <i>Neural Networks and Learning Machines</i> , Pearson Education (2011). 3. Rumelhart D E and McClelland J L, <i>Parallel and Distributed Processing: Explorations in Microstructure of Cognition</i> , Vol. 1, MIT Press (1986). 4. Rumelhart D E and McClelland J L, <i>Parallel and Distributed Processing: A Handbook of Models</i> , MIT Press (1989).	