

Deep Learning and Reinforcement Learning		Semester	
Course Code	BAI701	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:2:0	SEE Marks	50
Total Hours of Pedagogy	40 hours Theory + 8-10 Lab slots	Total Marks	100
Credits	04	Exam Hours	
Examination nature (SEE)	Theory/practical/Viva-Voce /Term-work/Others		
<b>Course objectives:</b> <ul style="list-style-type: none"><li>Understand the fundamentals of deep learning.</li><li>Know the theory behind Convolutional Neural Networks, RNN.</li><li>Illustrate the strength and weaknesses of many popular deep learning approaches.</li><li>Introduce major deep learning algorithms, the problem settings, and their applications to solve real world problems</li></ul>			
<b>Teaching-Learning Process (General Instructions)</b> <p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"><li>Black board teaching (Chalk and talk)</li><li>PPT and videos</li><li>Hands-on sessions using Python</li><li>Quiz/Puzzles</li><li>Seminars</li></ol>			
MODULE-1			
<b>Introduction to Deep Learning</b> <p>Introduction, Shallow Learning, Deep Learning, Why to use Deep Learning, How Deep Learning Works,Deep Learning Challenges,. How Learning Differs from Pure Optimization, Challenges in Neural Network Optimization.</p> <p><b>Textbook 1:</b> Ch 1.1 – 1.6, <b>Textbook 2:</b> 8.1,8.2</p>			
MODULE-2			
<b>Basics of Supervised Deep Learning</b> <p>Introduction, Convolution Neural Network, Evolution of Convolution Neural Network, Architecture of CNN, Convolution Operation</p> <p><b>Textbook 1:</b> Ch 2.1 – 2.5</p>			
MODULE-3			
<b>Training Supervised Deep Learning Networks</b> <p>Training Convolution Neural Networks, Gradient Descent-Based Optimization Techniques, Challenges in Training Deep Networks.</p> <p><b>Supervised Deep Learning Architectures:</b> LetNet-5,AlexNet</p> <p><b>Text Book - 1 :</b> Ch 3.2,3.4,3.5, Ch 4.2,4.3</p>			
MODULE-4			
<b>Recurrent and Recursive Neural Networks</b> <p>Unfolding Computational Graphs, Recurrent Neural Network, Bidirectional RNNs, Deep Recurrent Networks, Recursive Neural Networks, The Long Short-Term Memory.Gated RNNs.</p> <p><b>Text Book – 2:</b> 10.1-10.3, 10.5, 10.6, 10.10</p>			
MODULE-5			
<b>Deep Reinforceme,nt Learning:</b> Introduction, Stateless Algorithms: Multi-Armed Bandits, The Basic Framework of Reinforcement Learning, case studies. <p><b>Textbook – 3:</b> Chapter 9: 9.1,9.2,9.3, 9.7</p>			