DEPARTMENT OF ELECTRONICS
Cochin University of science and Technology

Course Schedule

Course: M.Tech. (Electronics & Communication Engineering)	**Name of Faculty: Mithun Haridas T.P.**
Topic: 18-437-0115 NEURAL NETWORKS	**Semester: FIRST**
Lecture Hall: MTech 1st **(Electronics & Communication)**	**Timings:** as per CBCS

Week and date	*Lecture topics*	*Assignments*	*Remarks*
Week 1 (10th July 19)	• Module 1: Introduction, Models of a Neuron, Neural networks viewed as • Directed Graphs, Feedback, Network Architectures,		
Week 2 (15thJuly 19)	• Knowledge Representation. Learning • Process–Supervised, Unsupervised and Reinforcement learning, Learning Tasks-Pattern Association, • recognition, function approximation, control, beamforming		
Week 3 (22nd July 19)	• Module 2: Perceptron – Perceptron convergence theorem, Relation between perceptron and Bayes classifier for a • Gaussian Environment, computer experiment-pattern classification, batch perceptron algorithm.	***Assignment-1*** • **Neural Network Model for Regression problem.(Python, Tensorflow)**	
Week 4 (29thJuly 19)	• Model building through regression- linear regression model, maximum a posteriori estimation of the parameter vector. Relationship between regularized least-squares estimation and map estimation, computer experiment: pattern classification. Least-Mean-Square Algorithm		
Week 5 (5th Aug 19)	• Module 3: Multilayer Perceptron – Batch learning and Online learning, Back propagation algorithm, XOR		

	problem		
Week 6 (12th Aug 19)	• Heuristics for making the back-propagation algorithm perform better, computer experiment: pattern classification.	***Assignment-1 submission***	
Week 7 (19th Aug 19)	• Module 4: Back Propagation - back propagation and differentiation, Hessian matrix, optimal annealing and adaptive control of the learning rate		
Week 8 (26th Aug 19)	First Internals		
Week 9 (2nd Sep 19)	• Approximations of function, Generalization, Cross validation, • Network pruning Techniques	***Assignment-2*** ➢ **Neural Network Model for Classification problem.(Python, Tensorflow)**	
Week 10 (16th Sep 19)	• Virtues and limitations of back propagation learning, Convolutional Networks		
Onam Vacation			
Week 11 (23rd Sep 19)	• Module 5: Kernel Methods and Radial-Basis Function networks – cover's theorem on the separability of patterns, the interpolation problem, radial-basis-function networks	***Assignment-2 submission***	
Week 12 (30th Sep 19)	• k-means clustering, recursive least-squares estimation of the weight vector, hybrid learning procedure for RBF networks,		
Week 13 (14th Oct 19)	Second Internals		
Week 14 (21st Oct 19)	• computer experiment: pattern classification, interpretations of the Gaussian hidden units, kernel regression and its relation to RBF networks		

Week 15 (28thOct 19)	*Revision: Neural Network Model for practical problems (Discussions)		
Week 16 (4th Nov 19)	*Revision: Neural Network Model for practical problems (Discussions)		
Week 17 (6th Nov 19)	*Publication of Sessional*		
Week 18 (7th Nov 19)	**REVISION**		