

SCHEME OF COURSE WORK

Course Details:

Course Title	: Neural Networks		
Course Code	: 13IT2115	L T P C	: 4 1 0 3
Program:	: M.Tech.		
Specialization:	: Software Engineering		
Semester	: II		
Prerequisites	: NIL		
Courses to which it is a prerequisite	: NIL		

Course Outcomes (COs):

1	Identify the various neural network models and their characteristics.
2	Differentiate feed forward and feedback neural networks and their functionalities.
3	Understand ANN for pattern recognition and applications of ANN.
4	Understand the concept of synaptic dynamics.
5	Understand the competitive learning neural networks.

Program Outcomes (POs):

A post graduate of Software Engineering will be able to

1	Ability to demonstrate in-depth knowledge of Software Engineering with analytical and synthesizing skills.
2	Ability to analyze complex problems critically and provide viable solutions.
3	Ability to evaluate potential solutions to a problem and arrive at optimal solutions.
4	Ability to apply research methodologies to develop innovative techniques for solving complex Information Technology related problems.
5	Ability to apply techniques and tools to solve complex problems.
6	Ability to work as an effective team member in a collaborative and multidisciplinary project to achieve common goals.
7	Ability to manage a software team and to maintain financial records as per standards.
8	Ability to effectively communicate with clients, peers and society at large.
9	Ability to take up lifelong learning to be in tune with the fast-changing software related technologies.
10	Ability to follow ethical practices in the software industry and accept social responsibility.
11	Ability to learn independently from mistakes and surge forward with positive attitude and enthusiasm.

Course Outcome Versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO-1	M	S		S	M				M		S
CO-2		M			M						
CO-3	M	S	M	M	M				M		M
CO-4		M		S	M						
CO-5	M	M	M	M	M				M		S

S - Strongly correlated, *M* - Moderately correlated, *Blank* - No correlation

Assessment Methods:	Assignment / Seminar / Mid-Test / End Exam
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Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Characteristics of neural networks, Historical development,	CO-1	Explain characteristics of neural networks	▫ Lecture	Assignment
2	Artificial neural networks: terminology, models of neurons	CO-1	What are the various models of neurons.	▫ Lecture ▫ Discussion	(Week 4 - 6)
3	Topology, basic learning laws.	CO-1	Write about neural network topology.	▫ Lecture ▫ Discussion	
4	Activation Dynamics models, Synaptic Dynamics models,	CO-4	Define synaptic dynamic model.	▫ Lecture	Mid-Test 1 (Week 9)
5	Learning methods, stability and convergence, recall in neural networks	CO-4	What is convergence, explain.	▫ Lecture	
6	Pattern Recognition Problems, Basic functional units, Pattern Recognition tasks by the functional units	CO-3	What are the Basic functional units of pattern recognition.	▫ Lecture	
7	Feed forward neural networks: Analysis of pattern association networks	CO-2	Define feed forward neural network.	▫ Lecture ▫ Discussion ▫ Problem solving	
8	Analysis of pattern classification networks, Analysis of pattern mapping networks	CO-2	What is meant by pattern mapping.	▫ Lecture	
9	Mid-Test 1				
10	Feedback neural networks: Analysis of linear auto associative FF Networks, Analysis of pattern storage networks, Stochastic Networks	CO-2	What are the types of auto associative FF Networks?	▫ Lecture ▫ Discussion ▫ Problem solving	
11	Simulated Annealing, Boltzmann Machine	CO-2	What is annealing?	▫ Lecture	Seminar (Week 15-17)
12	Competitive learning neural networks: Components of competitive learning networks	CO-5	What is basic competitive learning?	▫ Lecture	
13	Analysis of feedback layer for different output functions	CO-5	Explain Analysis of feedback layer with linear output functions.	▫ Lecture ▫ Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
14	Analysis of pattern clustering networks, analysis of feature mapping networks	CO-5	Write algorithm for self-organizing feature map learning.	▫ Lecture	
15	Architectures for complex pattern recognition tasks: Associative memory, stability-plasticity dilemma: ART	CO-5	Explain temporal associative memory.	▫ Lecture	
16	Temporal patterns, Pattern Variability, Neocognition	CO-5	What is meant by Pattern Variability	▫ Lecture	
17	Applications of ANN: Direct Applications, Application Area	CO-5	Mention direct applications of ANN	▫ Discussion	
18	Mid-Test 2				
19/20	END EXAM				