DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LESSON PLAN

Course Code	Course Title	Year/Sem	Branch	Contact Hrs/Week	Section
R20	AI APPLICATIONS TO ELECTRICAL ENGINEERING (PROFESSIONAL ELECTIVE – V)	IV/I	EEE	5	EEE

COURSE OUTCOMES:

At the end of the course students are able to

CO1: Analyse different models of artificial neuron & Use learning methods of ANN.
CO2: Evaluate different paradigms of ANN.
CO3: Classify between classical and fuzzy sets.
CO4: Illustrate different modules of Fuzzy logic controller.
CO5:Apply Neural Networks and fuzzy logic for real-time applications.

Unit No.	Out Comes		TOPIC(S)	BOOK Reference	Total periods	Delivery Method	GATE/ IES
		UNIT I - Introduction					
1	CO1:To understand artificial neuron models & learning methods of ANN.	1.1	Artificial Neural Networks (ANN)	T1	15	Chalk & Talk, PPT, Active Learning, Smart board & Tutorial	
		1.2	Humans and computers	T1			
		1.3	Biological neural networks	T1			
		1.4	ANN Terminology	T1			
		1.5	Models of Artificial neuron	T1			
		1.6	activation functions	T1			
		1.7	typical architectures	T1			
		1.8	biases and thresholds	T1			
		1.9	Learning strategy(supervised - unsupervised and reinforced)	T1			
		1.10	Neural networks learning rules.	T1			

		1.11	Single layer feed forward neural networks: concept of pattern and its types	T1			
		1.12	erceptron training and classification using Discrete andContinuous perceptron algorithms	T1			
		1.13	linear separability	T1			
		1.14	XOR function.	T1			
UNIT II - Multi-layer feed forward networks						
2	CO2: To utilize different algorithms of ANN.	2.1	Generalized delta rule	T1, T2	10	Chalk & Talk, PPT Tutorial, Active Learning Smart board&C ase Study	
		2.2	Back Propagation algorithm	T1, T2			
		2.3	Radial Basis Function (RBF) network	T1, T2			
		2.4	Kohonen's self-organizing feature maps (KSOFM)	T1			
		2.5	Learning Vector Quantization (LVQ)	T1			
		2.6	Bidirectional Associative Memory(BAM)	T1			
		2.7	Hopfield Neural Network.	T1			
UNIT III – Classical Sets and Fuzzy Sets						
3	CO3: To distinguish between classical and fuzzy sets.	3.1	Introduction to classical sets	T1, T2	15	Chalk & Talk, PPT, Smart board'La b, Tutorial	
		3.2	properties	T1, T2			
		3.3	Operations and relation	T2			
		3.4	Fuzzy sets - Operations - Properties	T1, T2			
		3.5	Fuzzy relations	T2			
		3.6	Cardinalities	T2			
		3.7	Membership functions.	T2			
UNIT IV-Fuzzy Logic Modules						
	CO4:To illustrated different modules of fuzzy controller.	4.2	Membership value assignment	T1, T2	10		
		4.3	development of rule base and decision making system	T1			
		4.4	Defuzzification to crisp sets	T1, T2			
		4.5	Defuzzification methods	T1, T2			
UNIT V -Applications						
		5.1	Load flow studies	T1, T2		Chalk &	

5	CO5: To analyze applications of neural networks and fuzzy logic.	5.2	load forecasting	T1, T2	11	Talk, PPT Tutorial, Active Learning & Seminars	
		5.3	reactive power control.	T2			
		5.4	Economic load dispatch	T2			
		5.5	speed control of DC motors	T2			
		5.6	single area and two area load frequency control.	T2			
			TOTAL		**61**		

CO1	Analyse different models of artificial neuron & Use learning methods of ANN.	APPLY	K3
CO2	Evaluate different paradigms of ANN.	APPLY	K3
CO3	Classify between classical and fuzzy sets.	APPLY	K3
CO4	Illustrate different modules of Fuzzy logic controller.	ANALYZE	K4
CO5	Apply Neural Networks and fuzzy logic for real-time applications.	APPLY	K3

CO-PO MAPPING: **(**1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]]; '-': No Correlation**)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1-K3	2	3	3	3	2	3	2	-	3	3	3	3
CO2-K3	2	3	2	2	2	3	2	-	3	3	3	3
CO3-K3	3	3	2	3	2	3	2	-	3	3	3	3
CO4-K4	3	3	2	3	2	3	2	2	2	3	2	2
CO5-K3	2	3	2	3	2	3	2	-	3	3	3	3

S.NO	GRADUATE ATTRIBUTION	ACTION VERBS	LEVEL
1	ENGINEERING KNOWLEDGE	APPLY	K3
2	PROBLEM ANALYSIS	ANALYZE	K4
3	DESIGN DEVELOPMENT OF SOLUTIONS	UNDERSTANDING	K2
4	INVESTIGATION OF COMPLEX PROBLEMS	APPLY, ANALYZE,	K3,K4
5	MODERN TOOL USAGE	APPLY	K3
6	ENGINEER AND SOCIETY		
7	ENVIRONMENT AND SUSTAINABILITY		
8	ETHICS	ANALYZE	K4
9	INDIVIDUALS AND TEAM WORK	APPLY, ANALYZE	K3,K4
10	COMMUNICATION	APPLY, ANALYZE,	K3,K4
11	PROJECT MANAGEMENT AND FINANCE	APPLY	K3
12	LIFE LONG LEARNING		

Text Books:	
S.No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
1.	Introduction to Artificial Neural Systems - Jacek M. Zuarda - Jaico Publishing House - 1997.
2.	Neural Networks - Fuzzy logic - Genetic algorithms: synthesis and applications by Rajasekharanand Pai – PHI Publication.
Reference Books:	
S.No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
1.	Artificial Neural Network – B.Yegnanarayana - PHI - 2012.
2.	Fuzzy logic with Fuzzy Applications – T.J Ross – Mc Graw Hill Inc - 1997.
3.	Introduction to Neural Networks using MATLAB 6.0 – S N Sivanandam - SSumathi - S N Deepa TMGH.
4.	Introduction to Fuzzy Logic using MATLAB – S N Sivanandam - SSumathi - S N Deepa Springer- 2007.

		Name	Signature with Date
i.	Faculty	Rongali Maha Lakshmi	
ii.	Course Coordinator		

HOD   **PRINCIPAL**