

Course Number and Name												
BEE014&Fuzzy Logic and Neural Network												
Credits and Contact Hours												
3 & 45												
Course Coordinator's Name												
Mr.K.S.S.Prasad												
Text Books and References												
Text Books:												
1. Kliryvan- Fuzzy System & Fuzzy logic Prentice Hall of India, First Edition.												
2. Lawrence Fussett- fundamental of Neural network Prentice Hall , First Edition.												
References:												
1. Bart Kosko, "Neural network and Fuzzy System" - Prentice Hall-1994												
2. J.Klin and T.A.Folger, "Fuzzy sets" University and information- Prentice Hall -1996												
3. J.M.Zurada, "Introduction to artificial neural systems"-Jaico Publication house,Delhi 1994												
4. VallusuRao and HayagvnaRao , "C++ Neural network and fuzzy logic"-BPP and Publication, New Delhi,1996												
5. Intelligent Systems and Control- http://nptel.ac.in/courses/108104049/16												
Course Description												
To master the various fundamental concepts of fuzzy logic and artificial neural networks. This will help you to get sufficient knowledge to analyze and design the various intelligent control systems												
Prerequisites						Co-requisites						
Fundamentals of Computing						Nil						
required, elective, or selected elective (as per Table 5-1)												
Required												
Course Outcomes (COs)												
CO1:To understand the basic concepts of fuzzy sets, fuzzy logic and defuzzification												
CO2:To learn the basics of Artificial Neural Networks and its algorithms												
CO3:To analyze various techniques in feedback and feed forward neural networks.												
CO4:To understand the principle of competitive neural networks and adaptive resonance theory												
CO5:To learn the architecture and algorithm of Cognitron, Neo cognitron and the concepts of fuzzy associative memory and fuzzy systems.												
Student Outcomes (SOs) from Criterion 3 covered by this Course												
COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l
CO1	M	M	M	H	M	M	M	H		H	L	M
CO2		M	M	H	H		M	H	H	H	L	M
CO3		H			H	M	L	H	H		L	H
CO4		H	M		H	M	L	M	H	L	H	H
CO5	H	M	M	H	H		M				L	L
List of Topics Covered												
UNIT I FUNDAMENTALS OF FUZZY LOGIC											9	
Basic concepts: fuzzy set theory- basic concept of crisp sets and fuzzy sets- complements- union-												

intersection- combination of operation- general aggregation operationfuzzy relations- compatibility relations-orderings- morphisms- fuzzy relational equations-fuzzy set and systems

UNIT II ARCHITECTURE OF NEURAL NETWORKS 9

Architectures: motivation for the development of natural networks-artificial neural networks-biological neural networks-area of applications-typical Architecture-setting weights-common activations functions- Basic learning rules- Mcculloch-Pitts neuron- Architecture, algorithm, applications-single layer net for pattern classification- Biases and thresholds, linear separability - Hebb's rule- algorithm -perceptron - Convergence theorem-Delta rule

UNIT III BASIC NEURAL NETWORK TECHNIQUES 9

Back propagation neural net:standard back propagation-architecture algorithm- derivation of learning rules-number of hidden layers--associative and other neural networks- hetro associative memory neural net, auto associative net- Bidirectional associative memory-applications-Hopfield nets-Boltzman machine

UNIT IV COMPETITIVE NEURAL NETWORKS 9

Neural network based on competition: fixed weight competitive nets- Kohonenself organizing maps and applications-learning vector quantization-counter propagation nets and applications adaptive resonance theory: basic architecture and operation-architecture, algorithm, application and analysis of ART1 & ART2

UNIT V SPECIAL NEURAL NETWORKS 9

Cognitron and Neocognitron- Architecture, training algorithm and application-fuzzy associate memories, fuzzy system architecture- comparison of fuzzy and neural systems