13EE41E1-NEURAL NETWORKS AND FUZZY LOGIC
(EEE)

Credits: 4

Lectures/Week: 4Hrs.   **Sessional Marks: 40**
End Exam Duration: 3Hrs   **End Exam Marks: 60**

UNIT-I

ARTIFICIAL NEURAL NETWORKS: Introduction to Neural Networks-Biological neurons-artificial neurons- MCculloch-pitts model-neuron modeling for artificial neural systems-feed forward network-Feedback network-perception network-Supervised and Unsupervised Learning.
LEARNING RULES: Hebbain learning rule, perception learning rule, Delta learning, Winner take all learning rule, ouster learning rule.

UNIT-II

SUPERVISED LEARNING: Preceptors -exclusive OR problem-single layer preceptor network- Multilayer feed forward networks: linearly non-separable pattern classification-delta learning rule for multi preceptor layer-Error back propagation algorithm-training errors-ADALINE-introduction to Radial basis function networks (RBFN)

UNIT-III

UNSUPERVISED LEARNING: Hamming net, Max net, Winner take all learning, counter propagation network-feature mapping-self organizing feature maps. Applications of neural algorithms-elementary aspects of applications of character recognition-Neural network control applications-process identification.

UNIT-IV

FUNDAMENTALS OF FUZZY LOGIC AND FUZZY SETS: Definition of Fuzzy set, a-level fuzzy set Cardinality-operation of Fuzzy set Cardinality-operations of fuzzy sets-Union, intersection, Complement- Cartesian product- Algebraic sum-definition of Fuzzy relation-properties of fuzzy relations-fuzzy composition.

UNIT-V

DESIGN OF FUZZY SYSTEMS: Components of fuzzy systems-Functions of fuzzification, Rule base patterns-Inference mechanisms-methods of defuzzification: Centre of Gravity method, mean of maxima method, weighted average method, Height method. Design of fuzzy systems for temperature setting of storage water heater-fuzzy system for control of air conditioner.

TEXT BOOKS:
1. "Introduction to Artificial Neural Systems" by Kacel M.Jurada, Jaico Publications
2. "Fuzzy Set Theory and its Applications" by Zimmerman K.J. Kluwer Academic Publishers

REFERENCES:
1 "Fuzzy Logic with Engineering Applications" by Timothy Ross,Tata McGrawHill
2 "Foundations of Neural Networks, Fuzzy Systems, and Knowledge Engineering" by Nikola K. Kasabov