
**NEURAL NETWORKS AND FUZZY LOGIC CONTROL
(ELECTIVE – II)****Course Code: 13EC2116****L P C
4 0 3****Course Outcomes:**

At the end of the course the student will be able to

CO1: Comprehend the concepts of feed forward neural networks

CO2: Analyze the various feedback networks.

CO3: Comprehend the concept of fuzziness involved in various systems and fuzzy set theory.

CO4: Understand the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy Control using genetic algorithm.

CO5: Analyze the application of fuzzy logic control to real time systems.

UNIT-I**ARCHITECTURES:**

Introduction –Biological neuron-Artificial neuron-Neuron modeling-Learning rules-Single layer-Multi layer feed forward network-Back propagation-Learning factors.

UNIT-II**NEURAL NETWORKS FOR CONTROL:**

Feedback networks-Discrete time hop field networks-Schemes of neuro –control, identification and control of dynamical systems-case studies (Inverted Pendulum, Articulation Control).

UNIT-III**FUZZY SYSTEMS:**

Classical sets-Fuzzy sets -Fuzzy relations- Fuzzification – Defuzzification- Fuzzy rules.

UNIT-IV**FUZZY LOGIC CONTROL:**

Membership function – Knowledge base-Decision –making logic – Optimizations of membership function using neural networks- Adaptive fuzzy systems-Introduction to genetic algorithm.

UNIT-V**APPLICATION OF FLC:**

Fuzzy logic control-Inverted pendulum-Image processing-Home Heating system-Blood pressure during anesthesia-Introduction to neuro fuzzy controller.

Text Books:

1. Kosko, B, “*Neural Networks and Fuzzy Systems: A Dynamical Approach to Machine Intelligence,*” Prentice Hall, NewDehli, 2004.
2. Timothy J Ross, “*Fuzzy Logic with Engineering Applications,*” John Willey and Sons, West Sussex, England, 2005.

Reference Books:

1. Jack M. Zurada, “*Introduction to Artificial Neural Systems,*” PWS Publishing Co., Boston, 2002.
2. Klir G.J. & Folger T.A.,”*Fuzzy sets, Uncertainty and Information,* ”Prentice –Hall of India Pvt. Ltd ., New Delhi,2008.
3. Zimmerman H.J.,”*Fuzzy set theory and its Applications,*” Kluwer Academic Publishres Dordrecht, 2001.
4. Driankov,Hellendroonb ,”*Introduction to fuzzy control,:* Narosa Publishers, 2001.
5. LauranceFausett,Englewood cliffs ,N.J.,:”*Fundamentals of Neural Networks,*” Pearson Eduction ,New Delhi,2008.