

17PS1207 - AI TECHNIQUES IN POWER SYSTEMS

Instruction/week: 4 hrs.
Univ. Exam: 3 hrs.

Max. Sessional marks: 40
Univ. Exam marks: 60

UNIT-I

INTRODUCTION TO NEURAL NETWORKS: Introduction, Humans and computers, organization of brain, Biological neuron, Biological and artificial neuron models-Introduction, neural network models, architectures, knowledge presentation, learning process, learning tasks.

UNIT-II

FEED FORWARD NEURAL NETWORKS: Introduction, perceptron models, Discrete and continuous perceptron networks, perceptron convergence theorem, limitation of perceptron model, applications.

ANN PARADIGM: Back propagation, RBF algorithms, Hopfield networks.

UNIT-III

GENETIC ALGORITHMS: Introduction, encoding, fitness function, reproduction operators.

GENETIC MODELING: Genetic operators- crossover and mutation, generational cycle, convergence of genetic algorithm.

UNIT-IV

CLASSICAL AND FUZZY SETS: Introduction to classical sets, properties, operations and relations; Fuzzy sets, membership, uncertainty, properties, fuzzy relations, cardinalities, membership functions.

UNIT-V

FUZZY LOGIC SYSTEM COMPONENTS: Fuzzification, membership value assignment, development of rule base and decision making system, defuzzification to crisp sets, defuzzification methods.

APPLICATION OF AI TECHNIQUES: Load frequency control, speed control of dc and ac motors

TEXT BOOKS:

1. "Neural networks, Fuzzy logic, Genetic algorithms: synthesis and application" by Rajasekharan and Rai, PHI publication
2. "Introduction to Artificial Neural systems" by Jacek M.Zurada, Jaico publishing house.

REFERENCES:

1. "Fuzzy Control" by Kevin M. Passino, Stephen Yurkovich, Addison-Wesley(1998)
2. "Fuzzy Logic with Engineering Applications" by Timothy J Ross, Mc-Graw Hill New york (1997)