

SOFT COMPUTING

Module-1:

Introduction to Soft Computing: Concept of computing systems, "Soft" computing versus "Hard" computing, Characteristics of Soft computing, Some applications of Soft computing techniques Artificial Neural Networks, Biological neurons and its working, Simulation of biological neurons to problem solving, Different ANNs architectures, Training techniques for ANNs, Applications of ANNs to solve some real life problems.

Module-2:

Fuzzy logic: Introduction to Fuzzy logic, Fuzzy sets and membership functions, Operations on Fuzzy sets, Fuzzy relations, rules, propositions, implications and inferences, Defuzzification techniques, Fuzzy logic controller design, Some applications of Fuzzy logic.

Module-3:

Genetic Algorithms: Concept of "Genetics" and "Evolution" and its application to probabilistic search techniques, Basic GA framework and different GA architectures, GA operators: Encoding, Crossover, Selection, Mutation, etc., Solving single-objective optimization problems using Gas, Multi-objective Optimization Problem Solving, Concept of multi-objective optimization problems (MOOPs) and issues of solving them, Multi-Objective Evolutionary Algorithm (MOEA), Non-Pareto approaches to solve MOOPs, Pareto-based approaches to solve MOOPs, Some applications with MOEAs.

Reference Books:

1. Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications,
2. S. Rajasekaran, G. A. Vijayalakshami, PHI.
3. Chin Teng Lin, C. S. George Lee, Neuro-Fuzzy Systems, PHI
4. Tomthy Ross, Fuzzy Logic and Engineering Application, TMH
5. Kishan Mehrotra, Elements of Artificial Neural Network, MIT Press
6. E. Goldberg, Genetic Algorithms: Search and Optimization, Addison-Wesley

