

IV YEAR SEM-II B.Tech CSE	ELECTIVE	L	T	P	C
CODE: CS4603	SOFT COMPUTING	2	2	0	4

**Unit – I: Soft Computing** Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

### **Unit – II: Feed-Forward Neural Networks**

Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm, Linear separability, Widrow & Hebb's learning rule/Delta rule, ADALINE, MADALINE. Introduction of MLP, different activation functions, Error back propagation algorithm, derivation of BBPA, momentum, limitation, characteristics and application of EBPA.

### **Unit – III: Fuzzy Logic**

Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions, Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

### **Unit – IV: Genetic algorithms**

Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences similarities between GA & other traditional methods.

### **Unit V: Neuro-Fuzzy Modeling**

Adaptive Neuro-Fuzzy Inference System (ANFIS): Architecture and Learning, Neuron Function for Adaptive Networks, Neuro-Fuzzy Spectrum, Neuro-Fuzzy Control,.

### **Unit VI: Rough Sets**

Introduction, Upper and Lower Approximation, Boundary Region, Decision Tables and Decisions Tables, Properties of Rough Sets, Rough Set Model based Tolerance Relations