III Year B.Tech.ECM II - Semester

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IT310 SOFT COMPUTING
(Elective-II)

Course Description and Objectives:
To know about the components and building block hypothesis of Genetic algorithm. To understand the features of neural network and its applications and to study the fuzzy logic components.

Course Outcomes:
- *Implement machine learning through neural networks.*
- *Gain Knowledge to develop Genetic Algorithm and Support vector machine based machine learning system.*
- *Understand fuzzy concepts and develop a Fuzzy expert system to derive decisions.*
- *Able to Model Neuro Fuzzy system for data clustering and classification.*

UNIT I - Neural Networks

History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta.

UNIT II - Fuzzy Logic

Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.
Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation.

UNIT III- Operations on Fuzzy Sets & Fuzzy Arithmetic

Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations.

Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

UNIT IV - Fuzzy Logic

Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges. Uncertainty based Information : Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

UNIT V - Application of Fuzzy Logic & Genetic Algorithm

Introduction of Neuro - Fuzzy Systems, Architecture of Neuro Fuzzy Networks. Medicine, Economics etc. An Overview, GA in problem solving, Implementation of GA

TEXT BOOKS:

1. AI & Expert system, Janki Raman ,MacMillen,2003
2. Artificial Intelligence, Knight ,TMH,1991.

REFERENCE BOOKS:

1. Artificial Intelligence, G.F luger,Pearson education,2003
2. Artificial Intelligence, Patricks henry ,Winston,Pearson education,2001
3. Artificial Intelligence, Nilsson , Morgon, Kufmann 1998.
4. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1995.