



CODE: PEC-CS-D-602

SUBJECT NAME: SOFT COMPUTING

NO OF CREDITS: 3

B.TECH 6th SEMESTER

SESSIONAL: 25

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THEORY EXAM: 75

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TOTAL : 100

Pre-requisites: Basics knowledge of Mathematics and Computer Science.

Course Objectives:

1. To introduce soft computing concepts and techniques and foster their abilities in designing appropriate technique for a given scenario.
2. To implement soft computing based solutions for real-world problems.
3. To give students knowledge of non-traditional technologies and fundamentals of artificial neural networks, fuzzy sets, fuzzy logic, genetic algorithms.
4. To provide students a hand-on experience on MATLAB to implement various strategies.

MODULE-1: INTRODUCTION TO SOFT COMPUTING

Evolution of Computing: Soft Computing Constituents, From Conventional AI to Computational Intelligence: Machine Learning Basics

MODULE-2: FUZZY LOGIC: Fuzzy Sets, Operations on Fuzzy Sets, Fuzzy Relations, Membership Functions: Fuzzy Rules and Fuzzy Reasoning, Fuzzy Inference Systems, Fuzzy Expert Systems, Fuzzy Decision Making.

MODULE-3: NEURAL NETWORKS: Machine Learning Using Neural Network, Adaptive Networks, Feed forward Networks, Supervised Learning Neural Networks, Radial Basis Function Networks : Reinforcement Learning, Unsupervised Learning Neural Networks, Adaptive Resonance architectures, Advances in Neural networks

MODULE-4: GENETIC ALGORITHMS: Introduction to Genetic Algorithms (GA), Applications of GA in Machine Learning : Machine Learning Approach to Knowledge Acquisition.

MODULE-5: MATLAB

Study of neural network toolbox and fuzzy logic toolbox, Simple implementation of Artificial Neural Network and Fuzzy Logic



Course Outcomes:

After completion of course, students would be able to:

1. Identify and describe soft computing techniques and their roles in building intelligent Machines.
2. Apply fuzzy logic and reasoning to handle uncertainty and solve various engineering problems.
3. Apply genetic algorithms to combinatorial optimization problems.
4. Evaluate and compare solutions by various soft computing approaches for a given problem.

REFERENCES

1. George J. Klir and Bo Yuan, “Fuzzy Sets and Fuzzy Logic: Theory and Applications”, PHI
2. Satish Kumar, “Neural Networks: A classroom approach” Tata McGraw Hill.
3. Haykin S., “Neural Networks-A Comprehensive Foundations”, PHI
4. Anderson J.A., “An Introduction to Neural Networks”, PHI
5. M.Ganesh, “Introduction to Fuzzy sets and Fuzzy Logic” PHI.
6. N P Padhy and S P Simon, “ Soft Computing with MATLAB Programming”, Oxford University Press