

## **Introduction to Soft Computing (MCS-E2) (Offered through SWAYAM only)**

[https://onlinecourses.nptel.ac.in/noc22\\_cs54/preview](https://onlinecourses.nptel.ac.in/noc22_cs54/preview)

**Unit 1:** Introduction to Soft Computing, Introduction to Fuzzy logic, Fuzzy membership functions, Operations on Fuzzy sets

**Unit 2:** Fuzzy relations, Fuzzy propositions, Fuzzy implications, Fuzzy inferences

**Unit 3:** Defuzzification Techniques-I, Defuzzification Techniques-II, Fuzzy logic controller-I, Fuzzy logic controller-II

**Unit 4:** Solving optimization problems, Concept of GA, GA Operators: Encoding, GA Operators: Selection-I

**Unit 5:** GA Operators: Selection-II, GA Operators: Crossover-I, GA Operators: Crossover-II, GA Operators: Mutation

**Unit 6:** Introduction to EC-I, Introduction to EC-II, MOEA Approaches: Non-Pareto, MOEA Approaches: Pareto-I

**Unit 7:** MOEA Approaches: Pareto-II, Introduction to ANN, ANN Architecture

**Unit 8:** ANN Training-I, ANN Training-II, ANN Training-III, Applications of ANN

### **Books and references**

1. An Introduction to Genetic Algorithm Melanic Mitchell (MIT Press)
2. Evolutionary Algorithm for Solving Multi-objective, Optimization Problems (2nd Edition), Collelo, Lament, Veldhnizer ( Springer)
3. Fuzzy Logic with Engineering Applications Timothy J. Ross (Wiley)
4. Neural Networks and Learning Machines Simon Haykin (PHI)