1st Semester

25PCCC01 COMPUTATIONAL METHODS AND TECHNIQUES (3-1-0)

Module - I   (10 Hours)
Neural Networks: Artificial Neural Network and Introduction, Learning Rules, Knowledge Representation and Acquisition, Different Methods of Learning.
Algorithms of Neural Network: Feed-forward Error Back Propagation, Hopfield Model, Kohonen's Featrure Map, K-Means Clustering, ART Networks, RBFN, Application of Neural Network to the relevant field.

Module - II   (10 Hours)
Fuzzy Logic: Basic Concepts of Fuzzy Logic, Fuzzy vs Crisp Set, Linguistic variables,Membership Functions, Operations of Fuzzy Sets, Fuzzy If-Then Rules, Variable Inference Techniques, Defuzzification, Basic Fuzzy Inference Algorithm, Fuzzy System Design, FKBC and PID Control, Antilock Breaking System(ABS), Industrial Applications.

Module - III   (10 Hours)
Optimization Fundamentals: Definition, Classification of Optimization Problems, Unconstrained and Constrained Optimization, Optimality Conditions.
LINEAR Programming: Simplex Method, Duality, Sensitivity Methods
NON-LINEAR Programming: Newton's Method, GRG Method, Penalty Function Method, Augmented Langrange Multiplier Method, Dynamic Programming and Integer Programming, Interior Point Methods, Karmakar's Algorithm, Dual Affine, Primal Affine.

Module - IV   (10 Hours)
Genetic Algorithm: GA and Genetic Engineering, Finite Element based Optimization, PSO,BFO, Hybridization of Optimization Technique, Application of Optimization Technique for Solving Projects(Project solutions).
Implementation of Branch Relevant Industrial Applications by Matlab Code.

Books Recommended:
1. Neural Networks- by Simon Haykin
2. Fuzzy Logic with Engineering Application- by ROSS J.T (Tata Mc)
3. Neural Networks and Fuzzy Logic – by Bart Kosko
4. An introduction Fuzzy Control – by D.Driankor, H. Hellendorn, M.Reinfrank (Narosa Pub)
5. Fuzzy Neural Control – by Junhong NIE & Derek Linkers (PHI)
6. Related IEEE/IEE Publications
7. Fuzzy System Design Principles, Building Fuzzy IF-THEN Rule Bases – by Riza C. Berikiu and Trubatch, IEEE Press
8. Ashok D. Begundu & chandrapatla T.R "Optimization concept and application in engineering",Prentice Hall,1999
9. Rao S.S "Engineering Optimization"
10. Gill,Murray and Wright ,"Practical Optimization"
11. James A.Memoh. "Electric Power System Application Of Optimization".
12. Song Y.,"Modern Optimization Techniques In Power System"
13. Optimization Research;Prabhakar Pai,Oxford University Press.