15 MMCC –304 OPTIMIZATION TECHNIQUES (3-0-0)

Module-I (10 Hours)
Linear programming: Formulation of LPP, Graphical solution, Simplex method, Big M method, Two Phase method, Revised simplex method, Duality theory and its application, Dual simplex method , Sensitivity analysis in linear programming
Transportation problems: Finding an initial basic feasible solution by Northwest Corner rule, Least Cost rule, Vogel's approximation method, Degeneracy, Optimality test, MODI method, Stepping stone method.
Assignment problems: Hungarian method for solution of Assignment problems.
Module -II (10 Hours)

Integer Programming: Integer programming problem, Importance and application of Integer programming problem, Gromory cutting plane method and fractional cut method Branch and Bound algorithm for solution of integer Programming Problems .Zero one programming problem.
Game theory : Pay off, types of games, maxima minima principle ,without saddle point ,2x2 and 2xn dominance principle
Dynamic programming : Decision tree Belmain principle of optimality characteristics of DPP DPP algorithm
Simulation and Modeling : Introduction to simulation and modeling,random variable ,monte carlo techinque and monte carlo, Simulation ,generation of random variables.
Sequencing : Principle assumption n jobs through two machine,N jobs with tree machine, N jobs and k machine , 2 jobs through k machine,Decision theory making process making environment under conditions of certainty
Module -III (10 Hours)
Goal programming: Goal programming model formulation, Goal programming algorithm and modified simplex method of Goal programming.
 Non-linear programming: Introduction to non-linear programming. Unconstraint optimization: Fibonacci and Golden Section Search method. Constrained optimization with equality constraint: Lagrange multiplier, Constrained optimization with inequality constraint: Kuhn-Tucker condition.
Ttext books
1. A. Ravindran, D. T. Philips, J. Solberg, " *Operations Research- Principle and Practice*", Second edition, Wiley India Pvt Ltd
2. Kalyanmoy Deb, " *Optimization for Engineering Design*", PHI Learning Pvt Ltd

Reference books:
1. **S**tephen G. Nash, A. Sofer, *" Linear and Non-linear Programming*", McGraw Hill
2. A.Ravindran, K.M.Ragsdell, G.V.Reklaitis," *Engineering Optimization*", Second edition, Wiley India Pvt. Ltd
3. H.A.Taha, A.M.Natarajan, P.Balasubramanie, A.Tamilarasi, "*Operations Research*", Eighth Edition, Pearson Education
4. F.S.Hiller, G.J.Lieberman, *" Operations Research*", Eighth Edition, Tata McDraw Hill
5. P.K.Gupta, D.S.Hira, "*Operations Research*", S.Chand and Company Ltd.
6. Kanti Swarup, P. K. Gupta, Man Mohan, "*Operations Research*", Sultan Chand and Sons.