

FMCC 601

OPERATION RESEARCH

(3-0-0)

Module-I (10 Hours)

Modeling of problems and principle of modeling. **Linear programming:** Formulation of LPP, Graphical solution, Simplex method, BigM method, II 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.

Module -II (10 Hours)

Assignment problems: Hungarian method for solution of Assignment problems.

Integer Programming: Branch and Bound algorithm for solution of integer Programming Problems.

Simulation and Modeling : Introduction to simulation and modeling.

Markov analysis : Introduction to markov processes, State and Transition Probabilities, Transition Diagram, n-step transition probabilities.

Module -III (10 Hours)

Queuing models: General characteristics, Markovian queuing model, M/M/1 model, Limited queue capacity, Multiple server, Finite sources, Queue discipline. **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.

Text 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. Stephen 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. KantiSwarup, P. K. Gupta, Man Mohan, " *Operations Research*", Sultan Chand and Sons.