

B.M.S COLLEGE OF ENGINEERING(AUTONOMOUS), BENGALURU-19
DEPARTMENT OF MATHEMATICS
SYLLABUS (2011 - 2012)

Course Name	Operations Research (Institutional Elective)	Course Code	11MA8IEOPR
Credits	04	L – T - P	4 -0- 0
Contact hours	52 hours		

Course outcomes:

Students on completion of the course will

- i) Model and solve linear programming problems.
- ii) Analyze and solve transportation and assignment problems.
- iii) Construct a project network.
- iv) Apply program evaluation review technique and critical path management.
- v) Use queuing theory to solve problems with inter-arrival and service times exponentially distributed using.

UNIT-1

INTRODUCTION: Evolution, definition, scope of OR, application areas of OR, steps (phases) in OR study, characteristics and limitations of OR, models used in OR, Linear Programming Problems (LPP) - formulation and solution by graphical method. Use of slack, surplus and artificial variables, Canonical and Standard forms, Solution of LPPs using Simplex method, big M method, Two-phase simplex method. Concept of duality, dual simplex method.

[12 hours]

UNIT-2

TRANSPORTATION PROBLEM: Formulation of transportation problem, types, initial basic feasible solution using North-West Corner method, least cost method, Vogel approximation method. Optimal solutions by MODI method, degeneracy in transportation problems.

[10hours]

UNIT-3

Assignment problem -Formulation, types, application to maximization cases and travelling salesmen problem. Integer programming problems-solution of integer programming problems-Gomory's cutting plane method, branch and bound method, Zero-one programming.

UNIT-4

PERT-CPM TECHNIQUES: Introduction, network construction-AON & AOA diagrams, Fulkerson's rule for numbering the events, Critical path method to find the expected completion time of a project, floats; PERT for finding expected duration of an activity and project, determining the probability of completing a project. Predicting the completion time of project; crashing of simple projects. **[10 hours]**

UNIT-5

QUEING THEORY: Queuing systems and their characteristics, Pure-birth and Pure –death models(only equations), empirical queuing models-M/M/1 models and their steady state performance analysis.

GAME THEORY: Formulation of games, types, solution of games with saddle point, graphical method of solving mixed strategy games, dominance rule for solving mixed strategy games. **[10hours]**

TEXT BOOK:

Operations Research by S.D. Sharma, _Kedarnath Ramanath & Co.2002

REFERENCE BOOKS

1. Introduction to Operations Research by Hiller and Liberman, Mc Graw Hill Publications.
2. Operations Researach by Taha H A, Pearson Education.

Question Paper Pattern:

1. Each unit consists of one full question.
2. Each full question consists of two, three or four subdivisions.
3. Five full questions to be answered.
4. Internal choice in Unit 1 and Unit 4.