

JIS College of Engineering
(NAAC 'A' Accredited Autonomous Institution)

Syllabus for B. Tech (CIVIL ENGINEERING)
3RD YEAR 6TH SEM

PAPER NAME: OPERATIONS RESEARCH (Free Elective for CE)

PAPER CODE: CE 605A

Contact: 3L

Credits: 3

Course contents

Module I

Linear Programming Problems (LPP): Basic LPP and Applications; Various Components of LP Problem Formulation. Solution of Linear Programming Problems: Solution of LPP: Using Simultaneous Equations and Graphical Method; Definitions: Feasible Solution, Basic and non-basic Variables, Basic Feasible Solution, Degenerate and Non-degenerate Solution, Convex set and explanation with examples. 5L

Solution of LPP by Simplex Method; Charnes' Big-M Method; Duality Theory. Transportation Problems and Assignment Problems. 12L

Module II

Network Analysis: Shortest Path: Floyd Algorithm; Maximal Flow Problem (Ford-Fulkerson); PERT-CPM (Cost Analysis, Crashing, Resource Allocation excluded). 6L

Inventory Control: Introduction to EOQ Models of Deterministic and Probabilistic ; Safety Stock; Buffer Stock. 3L

Module III

Game Theory: Introduction; 2-Person Zero-sum Game; Saddle Point; Mini-Max and Maxi-Min Theorems (statement only) and problems; Games without Saddle Point; Graphical Method; Principle of Dominance.

5L

Module IV

Queuing Theory: Introduction; Basic Definitions and Notations; Axiomatic Derivation of the Arrival & Departure (Poisson Queue). Poisson Queue Models: (M/M/1): (/ FIFO) and (M/M/1: N / FIFO) and problems. 5L

Text Books:

1. H. A. Taha, "Operations Research", Pearson
2. P. M. Karak – "Linear Programming and Theory of Games", ABS Publishing House
3. Ghosh and Chakraborty, "Linear Programming and Theory of Games", Central Book Agency
4. Ravindran, Philips and Solberg - "Operations Research", WILEY INDIA

References:

1. KantiSwaroop — "Operations Research", Sultan Chand & Sons
2. Rathindra P. Sen—"Operations Research: Algorithms and Applications", PHI
3. R. Panneerselvam - "Operations Research", PHI

4. A.M. Natarajan, P. Balasubramani and A. Tamilarasi - "Operations Research", Pearson
5. M. V. Durga Prasad – "Operations Research", CENGAGE Learning
6. J. K. Sharma - "Operations Research", Macmillan Publishing Company