

Course Title: Quantitative Techniques

Course Code: 306

- 1) Linear Programming: Requirements for a Linear Programming Problem(LPP), Assumptions in Linear Programming, Formulation of LPP
 - Advantages and Limitations of Linear Programming Models
 - Graphical Method of Solution
 - The Simplex Method for finding Solution of a LPP **(10 hours)**

- 2) The Transportation Model: Assumptions in the Transportation Model, Definition of the Transportation Model, Formulation and Solution of Transportation Models, Least Time Transportation Problems, Post Optimality Analysis in Transportation ,The Trans- Shipment Problem, Dual of the Transportation Problem **(10 hours)**

- 3) The Assignment Model: Mathematical Representation of the Assignment Model Comparison with the Transportation Model, Formulation and Solution of the Assignment Problems, Variations of the Assignment Problems, Sensitivity Analysis, The Travelling Salesman Problem (Shortest Cyclic Route Model). **(10 hours)**

- 4) Sequencing Models: Assumptions in Sequencing Models, Processing n Jobs through m Machines, Solution of Complicated Sequencing Problem, Routing Problems in Networks. **(10 hours)**

- 5) Decision Theory, Game Theory, Investment Analysis: Steps in Decision Theory Approach, Decision Making Environments, Decision Making under Conditions of Certainty, Uncertainty, risk, Maximum Likelihood Criterion, Expected Value of Criterion for Continuously Distributed Random Variables, The Theory of Games ,Characteristics of Games, Game Models, Rules of Game Theory, Mixed Strategies (2 x 2 games), Mixed Strategies (2 x n Games, m x 2 Games, Limitations of Game Theory, Methods of Investment Analysis, Break Even Analysis, Payback Period Method ,Average Rate of Return Method, Time Adjusted or Discounted Cash Flow Method ,Internal Rate of Return Method ,Certainty Equivalent Approach. **(12 hours)**

- 6) Queuing Model: Applications of Queuing Model, Elements of a Queuing Model, Operating Characteristics, Waiting time and Idle Time Costs, Models of Arrival and Service Times, Assumptions and Limitations of Queuing Model. **(8 hours)**

Recommended books:

V.K.Kapoor, Operations Research

Hira & Gupta, Operations Research
C.R.Kothari, Quantitative techniques
B.S.Grewal, Advanced Numerical Methods
N.D.Vora, Quantitative Techniques