Course CODE:PBO3ECOM 08	Total Credits :5
Course Title : Operations Research	
Objective: To provide conceptual knowledge of Research Methodology which will useful in Research in any area.	

Unit	Description in detail	Weightage (%)
1	**INTRODUCTION TO OPERATIONS RESEARCH:** **Operations Research – Quantitative Approach to Decision Making, Definitions of O.R., Characteristics of O.R., Application and Scope of O.R. , Phases of O.R., Different types of Models in O.R.(1)Physical Models: Iconic models ,Analogue Models, (2) Classification based on function: Descriptive models Predictive models, Prescriptive models (3) Classification based on behavior: Static models, Dynamic models (4) Classification based on degree of certainty: Deterministic models, Probabilistic models. (5) Classification based on method of solution: Heuristic Models, Analytical models, Simulation models. General methods of solving O.R. models: Analytical method, Numerical method, Monte- Carlo method. Techniques & Tools of O.R., Opportunities and Shortcoming of the O.R Approach.**	**25**(%)
2	**LINEAR PROGRAMMING AND ITS APPLICATIONS:** **Meaning and Definition of Linear Programming, Assumptions, Uses and Limitations of L.P., Mathematical form of L.P. Problem, Formulations of L.P. Problem, Important Terms used in L.P, Graphical Method, Simplex method for Maximization problem, Big –M method for Minimization cases, Degeneracy, Unbounded and Infeasible cases. Application of L.P. : Production planning problem, Advertising Media selection problem, Product mix problem, Simple examples based on various methods.**	**25**(%)

3	**TRASPORTATION PROBLEM :**	**25**(%)
	Meaning, General Mathematical Model of T.P., The Transportation Algorithm, Methods of finding initial solution :North-West Corner Method, Least Cost Method, Vogel's Approximation Method, Unbalanced T.P. Test for Optimality: Modified Distribution Method (MODI Method), Degeneracy in T.P., Prohibited routes, Maximization Problems, Simple examples based on various methods.	
4	**ASSIGNMENT PROBLEM AND SEQUENCING PROBLEM:**	**25**(%)
	Assignment Problem: Formulation, Hungarian Method, (Minimization and Maximization Problem), Assignment Problem with restriction, Unbalanced Assignment Problem, Travelling Salesman Problem. **SEQUENCING PROBLEM:** **Introduction, Notations, Terminology and Assumptions, Processing n Jobs Through Two Machines, Processing n Jobs Through Three Machines, and Applications based on two Models.**	

References:

 (1) Sharma J.K.: Introduction to Operations Research

(2) Taha H.A.: Operations Research- An Introduction

(3) Kapoor V.K. : Problems and Solutions in Operations Research

(4) J.K.Sharma: Operations Research Theory and Applications (3rd edition)