

BON SECOURS COLLEGE FOR WOMEN (AUTONOMOUS)

VILAR BYPASS, THANJAVUR – 613006

APPLIED OPERATIONS RESEARCH - 24PMS107

Course Outcome:

Unit	CO	Upon Completion of this Course the Students will be able to
Unit - I	CO 1	Identify the scope and characteristics of Operations research and explain its application in different functional areas of management.
Unit - II	CO 2	Solve linear programming problems using graphical and simplex methods, and understand the concepts of primal and dual problem, including the use of artificial variables.
Unit - III	CO 3	Apply methods and techniques to solve transportation problems, and utilize the Hungarian method to solve assignment problems and traveling salesman problems.
Unit - IV	CO 4	Apply PERT and CPM techniques for project scheduling and resource management, and utilize inventory models for effective resource allocation.
Unit - V	CO 5	Analyse and apply game theory concepts, including two-player zero-sum games, saddle points, mixed strategies, and various programming techniques.

Syllabus

UNIT I:

Introduction: Overview of operations research – Origin – Nature, scope & characteristics of OR – Models in OR – Application of operations research in functional areas of management.

UNIT II:

Linear Programming Problems: Linear programming problem model – Formulation – Maximization & Minimization problem – Graphical method – Simplex method -Artificial variable – Pimal & Dual.

UNIT III:

Transportation problem: Basic Solution – North /West corner Solution, LCM, VAM, Matrices method-Optimal Solution – Stepping stone method – Vogel's approximation method – Modi method – Degeneracy – Imbalance matrix – Assignment model: Hungarian method – Travelling salesman problem.

UNIT IV:

Project Scheduling and Resource Management Deterministic: Inventory models – Purchasing & Manufacturing models – Probabilistic inventory models – Replacement model – Sequencing – Brief Introduction to Queuing models, Networking – Programme Evaluation and Review Techniques (PERT) and Critical Path Method (CPM) for projects scheduling – Crashing – Resource allocation and resource Scheduling.

UNIT V:

Game Theory and Strategies: Games theory – two player zero sum game theory – Saddle point- Mixed Strategies for games without saddle points – Dominance method – Graphical and LP solutions – Goal Programming: Simulation; Inter Programming and Dynamic programming.

Text Book:

1. Unit I – V S. Kalavathy, Operations Research, Fourth Edition, Vikas Publication.

UNIT – I - Chapter 1: Sections 1.1 to 1.7

UNIT – II - Chapter 2: Sections 2.1 to 2.3

Chapter 3 Section 3.1 to 3.4

Chapter 4 Section 4.1 to 4.2

Chapter 5 Section 5.1 to 5.5

UNIT – III - Chapter 8 : Section 8.1 to 8.6

Chapter 9: Section 9.1 to 9.6

UNIT – IV - Chapter 15: Sections 15.1 to 15.9

Chapter 16: Section 16.1 to 16.7

UNIT – V - Chapter 19: Sections 19.1 to 19.5

Chapter 20:Section 20.1 to 20.3