

**III B. Tech – II Semester
(20ME6318) OPERATIONS RESEARCH**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	-	-	3

Pre-Requisites: Algebra, Basic probability distribution and statistics, Calculus

Course Objectives:

- To learn the importance of Operations Research in the design, planning, scheduling, manufacturing and business applications
- To use the various techniques of Operations Research in solving such problems.

UNIT-I: Development

Definition– characteristics and phases – types of operation research models – applications.

ALLOCATION: Linear programming problem formulation – graphical solution – simplex method – artificial variables techniques -two–phase method, big-M method – duality principle.

UNIT-II: Transportation Problem

Formulation – optimal solution, unbalanced transportation problem – degeneracy, assignment problem – formulation – optimal solution - variants of assignment problem- traveling salesman problem.

SEQUENCING– Introduction –flow–shop sequencing– n jobs through two machines – n jobs through three machines – job shop sequencing – two jobs through ‘m’ machines.

UNIT-III: Theory Of Games

Introduction – mini. max (max. mini) – criterion and optimal strategy – solution of games with saddle points–rectangular games without saddle points – 2x2 games – dominance principle – m x 2 & 2 x n games – graphical method.

WAITING LINES: Introduction – single channel – poisson arrivals – exponential service times – with infinite population and finite population models – multichannel – poisson arrivals – exponential service times with infinite population single channel poisson arrivals.

UNIT-IV: Inventory

Introduction – single item – deterministic models – purchase inventory models with one price break and multiple price breaks – shortages are not allowed – stochastic models – demand may be discrete variable or continuous variable – instantaneous production. Instantaneous demand and continuous demand and no set up cost. ABC & VED Analysis.

UNIT-V: Dynamic Programming

Introduction– Bellman’s principle of optimality– applications of dynamic programming - capital budgeting problem – shortest path problem – linear programming problem.

SIMULATION: Definition – types of simulation models – phases of simulation – applications of simulation – inventory and queuing problems – advantages and disadvantages – simulation languages.

Course Outcomes:

After successful completion of the course, the students will be able to:

S. No	Course Outcome	BTL
1.	To perform Linear programming problem formulation	L2
2.	To make use of transportation problem and sequencing problems	L2
3.	To make use of Game theory and waiting line theory	L4
4.	To use Inventory models	L2
5.	To make use of dynamic programming models	L4

Correlation of COs with POs& PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	2	1	1	1	2	2	2	2	2	3	2
CO2	2	2	1	1	1	1	1	1	2	2	2	1	2	2
CO3	2	2	2	2	3	1	1	1	1	2	2	1	3	2
CO4	2	2	1	1	1	1	1	2	1	2	2	2	3	1
CO5	2	2	1	1	1	1	1	1	1	2	2	2	3	2

Text Books:

1. Operations Research – An Introduction / Hamdy A Taha/ Pearson publishers
2. Operations Research – Theory & publications / S.D.Sharma – Kedarnath / Mc Millan publishers India Ltd

References:

1. Introduction to O.R / Hiller & Libermann / TMH
2. Operations Research/A.M.Natarajan, P.Balasubramani, A.Tamilarasi / Pearson Education.
3. Operations Research: Methods & Problems / Maurice Saseini, ArthurYaspan & Lawrence Friedman / Wiley
4. Operations Research / R.Pannerselvam / PHI Publications.
5. Operations Research / Wagner / PHI Publications.
6. Operations Research / J.K.Sharma / Mac Milan Publ.
7. Operations Research / Pai / Oxford Publications
8. Operations Research / SKalavathy / Vikas Publishers
9. Operations Research / DS Cheema / University Science Press
10. Operations Research / Ravindran, Philips, Solberg / Wiley publishers