19AE342 OPERATIONS RESEARCH MANAGEMENT

Source :
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Hours Per Week :

L	T	P	C
3	-	-	3

Total Hours :

L	T	P
45	-	-

CS	WA/RA	SSH	SA	S	BS
-	10	45	-	-	-

COURSE DESCRIPTION AND OBJECTIVES:

This course deals with design, planning, scheduling, manufacturing and business applications and to use the various techniques of Operations Research in solving such problems. The objective of this course is to enable the students to apply linear programming, transportation, and assignment, inventory and network techniques for various engineering applications.

COURSE OUTCOMES:

Upon completion of the course, the students will be able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Understand the concepts of operations research modelling approaches.	1,10,11
2	Formulate and solve engineering and managerial situations as LPP.	2,5,11,12
3	Formulate and solve engineering and managerial situations as Transportation and Assignment problems.	5,7,9
4	Understand game theory, queuing theory& inventory models concepts.	6,9,11
5	Analyse the queuing theory model and implement for the daily life usage in service oriented Industries.	2,5,9,12

SKILLS:

- ✓ *Recognize the importance of Operations Research and mathematical modelling for solving practical problems in industries.*
- ✓ *Implement transportation and assignment solutions using appropriate optimization algorithms.*
- ✓ *Apply game and queuing theory appropriately to solve problems.*
- ✓ *Analyse and apply inventory control and project management techniques.*

UNIT - I **L-9**

DEFINITION: Definition - Characteristics and phases; Applications of OR.

ALLOCATION MODELS: Linear Programming Problem Formulation - Graphical solution – Simplex method - Artificial variables technique (i.e. Big M method only) - Duality principle; simple problems on dual formulation only.

UNIT - II **L-9**

TRANSPORTATION MODEL: Formulation; IBFS-North West Corner method; LCEM; VAM; Unbalanced transportation problem; Optimality test by MODI method.

ASSIGNMENT MODEL: Formulation - Optimal solution by Hungarian method – Unbalanced Assignment problem- Restricted case.

UNIT - III **L-9**

SEQUENCING: Introduction – Assumptions in job sequencing; Johnson's algorithm; optimal solution for processing 'n' jobs through two machines; 'n' jobs through three machines; 'n' jobs through m machines.

REPLACEMENT MODEL: Introduction - Replacement of resources that deteriorate with time – when money value is not counted and counted.

UNIT - IV **L-9**

THEORY OF GAMES: Introduction-classification of games- 2 person zero sum games- Assumptions -solution of games with saddle points - Rectangular games without saddle points; dominance principle - 2 X 2 games by Algebraic method; m X 2 and 2 X n games by graphical method.

WAITING LINE MODELS: Introduction – Kendall's Lee notation- single channel with infinite population; Multi- channel with infinite population.

UNIT - V **L-9**

INVENTORY MODELS: Introduction - single item - Deterministic models (EOQ & EBQ) without shortages- Purchase inventory models with one price break and multi-price break when shortages are not allowed.

NETWORK ANALYSIS: Activity analysis; Network construction; Critical path method (CPM); Programme Evaluation Review Technique (PERT)-Problems.

TEXT BOOKS:

1. S.D. Sharma, "Operations Research", 8th ed., Kedarnath Publishers, 2007.
2. P.K.Gupta and Manmohan, "Problems in Operations Research", 8th ed., S.Chand& Co., 2003.

REFERENCES BOOKS:

1. Taha, "Introduction to Operations Research", 8th ed., PHI Publications, 2008.
2. Hiller &Libermann, "Introduction to Operations Research", 8th ed., Tata McGraw Hill, 2010.
3. ManoharMahajan, "Operation Research", 1st ed., DhanpatRai& Co., 2008.
Premkumar Gupta and D.S.Hira, "Problems in Operations research", 2009 S.Chand