

Minor: Operations Research

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Prerequisite(s) of the Course (if any)
	Lecture	Tutorial	Practical / Practice		
Operations Research	4	0	0	10 + 2 from a recognized board in Commerce stream	Nil

LEARNING OBJECTIVES (LO)	
LO-1	To make the students familiar with basic techniques of Operation Research
Course OUTCOMES (CO)	
At the end of the course, a student will be able to –	
CO-1	Set up decision models and use some solution methods for optimization problems.
CO-2	Use CPM and PERT techniques, to plan, schedule, and control project activities.
CO-3	Define and formulate linear programming problems

Syllabus of [COMN441C]

Unit 1: Introduction of OR & LPP (15 lectures)

Introduction of Operation Research: Meaning and Evolution, Uses, Characteristics, Advantages, Limitations

Linear Programming Problem: Meaning of linear programming, its uses, assumptions and limitations, Explanation of basic terminologies, Mathematical form of linear programming problem, Solution of linear programming problem by using graphical methods, Simple formulation problems (for two variables).

Unit 2: Transportation Problem (15 lectures)

Meaning of balanced Transportation Problem (T.P.), General Transportation table and its mathematical form, Initial basic feasible solution and initial cost by using North-West Corner rule, Least Cost Method, Vogel's Approximation Method, Examples based on these methods. Meaning of Unbalanced Transportation Problem and Examples based on the above three methods

Unit 3: Assignment and Replacement Problems (15 lectures)

Assignment Problems: Definition of balanced Assignment Problem (A.P.), its mathematical form, Application of Hungarian method for solving A.P. in the cases of maximization and minimization problem,

Replacement Problems: Meaning of Replacement problem (R.P.), Simple examples of replacement problem when the units are deteriorate depending on time and money value remains same

Unit 4: PERT and CPM Techniques (15 lectures)

PERT: Meaning and characteristics of PERT, Explanation of basic terms — activity, event, dummy activity, optimistic time, pessimistic time, most likely time, Fulkerson's rule for numbering the events

CPM: Meaning of Critical Path Method (CPM), Differences between PERT and CPM, Earliest start time, Earliest finish time, Latest start time, Latest finish time, Total float time of activities, Uses and limitations of PERT and CPM and simple examples.

Distribution of Marks: Problem – 60 % and Theory – 40%

Text Book:

J.K.Sharma: O.R. Theory and Applications, Macmillan India Ltd

Suggestive Readings:

- H.A.Taha, Operations. Research, Macmillan Publishing Co. Inc.
- Vohra N. D, Quantitative Techniques in Management Tata McGraw Hill, New Delhi.
- Anderson, Sweeney, Williams, An Introduction to Management Science Quantitative Approach to Decision Making, Cengage Learning India Pvt. Ltd. New Delhi.
- Barry Render, Ralph M. Stair, Michael E. Hanna, Quantitative Analysis for Management, Pearson Education (Singapore) Pte. Ltd.