

UNIVERSITY OF MADRAS
BACHELOR OF COMPUTER APPLICATIONS (BCA)
DEGREE PROGRAMME
SYLLABUS WITH EFFECT FROM 2023-2024

Year:III

Semester: V

Operations Research	320E5A
Credits 3	Lecture Hours:4 per week
Learning Objectives: (for teachers: what they have to do in the class/lab/field) <ul style="list-style-type: none"> • The Objective of the paper is to introduce the basic concepts of Operational Research and linear programming to the students 	
Course Outcomes: (for students: To know what they are going to learn) <ol style="list-style-type: none"> 1. Solve linear programming problems using appropriate techniques and optimization solvers, interpret the results obtained. 2. Determine optimal strategy for Minimization of Cost of shipping of products from source to Destination/ Maximization of profits of shipping products using various methods, Finding initial basic feasible and optimal solution of the Transportation problems 3. Optimize the allocation of resources to Demand points in the best possible way using various techniques and minimize the cost or time of completion of number of jobs by number of persons. 4. Formulate Network models for service and manufacturing systems, and apply operations research techniques and algorithms to solve these Network problems 	

Units	Contents
I	Definition of operations research, models of operations research, scientific methodology of operations research, scope of operations research, importance of operations research in decision making, role of operations management, limitations of OR.
II	Linear Programming: Introduction – Mathematical formulation of a problem – Graphical solutions, standard forms the simplex method for maximization and minimization problems. Method application to management decisions. Transportation problem – Introduction – Initial basic feasible solution – NWC method – Least cost method – Vogel’s method – MODI – moving towards optimality – solution procedure without degeneracy
III	Assignment problem – Algorithm – Hungarian method – simple problems
IV	Sequencing and replacement model: Sequencing problem – processing through 2machines, 3 machine – s jobs and k machines and traveling salesman problem. Replacement of items that deteriorate gradually – with time, without time, that fails completely – individual replacement – group replacement.
V	Network models and simulation. Network models for project analysis CPM - Network construction and time analysis; cost time trade off, PERT – problems

Text Books:

1. Kanti swaroop, P.K.Guptha and Man Mohan: Operation Research. SultanChand.
2. BA/BSc III Year paper - IV Statistics - quality, reliability and operationsResearch - Telugu Academy by Dr T.C.Ravichandra Kumar, DrR.V.S.Prasad, Dr D.Giri, Dr G.S.Devasena.
3. Operation Reach – S.D.Sharma.

Reference books

1. S.K Sinha: Reliability and life testing. Wiley Eastern.
2. Operations research - Models and methods by Chandrasekar Salimath,Bhupendar Parashar.
3. Operation Research – Taha.