

OPERATIONS RESEARCH			
Course Code	20MBA24	CIE Marks	40
Teaching Hours/Week (L:T:P)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Course objectives: <ul style="list-style-type: none"> Understand the mathematical tools that are needed to solve optimisation problems Solve linear programming problems using appropriate techniques to take informed Decision To understand and practice allocation problems, Assignments problems, Transportation problems and Network Analysis (PERT & CPM). 			
Module -1 Introduction			7 hours
Definition, scope of Operations Research, characteristics, advantages and limitations. Quantitative approach to decision making models (Theory Only)			
Module -2 Linear programming			9 hours
Structure of linear program model, Assumption, Advantages, Limitations, General mathematical model, Guidelines for formulation of linear programming model, Formulation of problems, graphical method.			
Module -3 Transportation problem			7 hours
General structure of transportation problem, methods of finding initial basic feasible solution (NWCM, LCM & VAM), Degeneracy, Optimality Test using Stepping Stone and MODI Methods (theory only). Assignment problems - Introduction, General structure. Problems on minimization & maximization.			
Module -4 Decision theory			9 hours
Decision under uncertainty- Maxmin & Minmax, Decision under Risk- Expected Value, Simple decision tree problems. (Only theory). Job Sequencing- N Jobs-two machines and N Jobs-three machines, 2 jobs-M machines cases. (Only theory).			
Module -5 Theory of games			9 hours
Formulation of game models, Two person Zero sum games & their solution, 2 x N and M x 2 games, pure strategy games with saddle point, Mixed strategies (Graphical and algebraic methods), Limitations of game theory. Simulation: process of simulation, types of simulation, steps in simulation process, Monte Carlo simulation, Simple problems on Simulation applications in Inventory, Queuing, finance problems, Advantages & Disadvantages.			
Module-6 Project management			9 hours
Structure of projects, phases of project management-planning, scheduling, controlling phase, work breakdown structure, project control charts, network planning, PERT & CPM, Network components & precedence relationships, critical path analysis, probability in PERT analysis, Theory of crashing (Theory Only), Theory of Constraints (Theory only).			
Course outcomes: <ol style="list-style-type: none"> Get an insight into the fundamentals of Operations Research and its definition, characteristics and phases Use appropriate quantitative techniques to get feasible and optimal solutions Understand the usage of game theory, Queuing Theory and Simulation for Solving Business Problems Understand and apply the network diagram for project completion Practical component: <ul style="list-style-type: none"> Learn and use TORA Software for analysis of all the OR Techniques and Real life Problems. Student should demonstrate the application of the techniques covered in this course. 			

CO – PO MAPPING.

CO	PO				
	PO1	PO2	PO3	PO4	PO5
CO1	X				
CO2	X		X	X	X
CO3	X		X		X
CO4	X		X		X

Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

- The question paper will have 8 full questions carrying equal marks.
- Each full question is for 20 marks.
- Each full question will have sub question covering all the topics under a Module.
- The students will have to answer five full questions; selecting four full question from question number one to seven and question number eight is compulsory.
- 40 percent theory and 60 percent problems in the SEE.

Textbook/ Textbooks

Sl No	Title of the book	Name of the Author/s	Publisher Name	Edition and year
1	Operation Research: An Introduction	H.A. Taha	Pearson Publication	2012
2	Operation Research	J K Sharma	McMillan Publications	2014

Reference Books

1	Quantitative Techniques in management	N D Vohra	McGraw Hill	2015
2	Operation Research	J K Sharma	McMillan Publications	2016