S. No.	Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
								Sessional	Final Exam	Total
3	MBA-203	Operation Research	Core Course	4	4	0	0	30	70	100

COURSE OUTCOMES

At the end of the course the student will be able to: -	
CO1	Understand relevant tools and techniques for solving optimization problems.
CO2	Apply quantitative methods in business situations to arrive at optimal decisions
CO3	Apply Operation Research techniques to model timely project completion within allotted resources
CO4	Evaluate different project models for a business problem to determine the best option
CO5	Appreciate the use of simulation to model different business situations

DETAILED SYLLABUS

UNIT I
Introduction to Operation Research: Scope, Phases, Models of Operations Research, Opportunities and Limitations of Management Science Approach.
Decision Making Environments: Certainty, Uncertainty, Risk & Conflict, Conditional Payoff, Expected loss & Opportunity loss. Single stage Decision making cases, Multi- stage Decision making Cases, Decision Tree analysis.

UNIT II
Transportation Model: Mathematical formulation, Least Cost Method, N-W Corner Method, VAM. Optimality Tests: Steppingstone method, MO-DI method; Application of transportation Model, Maximisation cases, Unbalanced Cases, Degeneracy in transportation. Assignment Model: Hungarian method, Special cases: Maximisation, Unbalanced cases, Travelling Salesman, Restricted routes, Flight/ Transport Scheduling.

UNIT III
Linear Programming: Formulation of problems, Graphical method, Simplex method, Big M Method, Sensitivity Analysis, Minimization/Maximization cases, Special cases, Duality in linear programming.

UNIT IV
Network Construction and Analysis, Time analysis: Forward Path analysis, Backward Path analysis, Floats, Slack, Three- time estimate. Critical Path Method (CPM), PERT Procedure & Analysis, Crashing technique.

UNIT V
Game Theory: Two- person Zero Sum Game, Mini-max, Maxi-min Principles, Saddle point, Mixed Strategies, Graphical method for 2 x n and m x 2 games, Dominance technique. Simulation for Business: Types of Simulation, Random variables, Monte Carlo method, Application of Simulation: Simulation of Inventory system and Queuing system, Advantages & Disadvantages of Simulation.

Text Books

S.No	Name of the Suggested Books	Name of Author	Publisher Name	Edition (Pub. Yr.)
1	Operations Research an Introduction	Taha, Hamdy	Pearson Publications	8th (2007)
2	Operations Research	S Kalavathy	UBS Publications	4th (2013)

Reference Books

S.No.	Name of the Book	Name of Author	Publisher Name	Edition (Pub. Yr.)
1	Quantitative Techniques in Management	Vohra, N. D	McGraw Hill Publishing House	3rd (2006)
2	Operation Research (Quantitative Techniques in Management)	Kapoor, V. K	Sultan Chand Publications	8th (2007)
3	Introduction to Operations Research	Hillier, Frederic & Gerald Lieberman	Tata McGraw Hill Publications	8th (2009)