

QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS

II Semester: MBA								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CMBC20	Core	4	-	-	4	30	70	100
		Contact Classes: 45		Tutorial Classes: Nil		Practical Classes: Nil		Total Classes: 45
<p>I. COURSE OVERVIEW: The main objective of the course is to help develop and enhance quantitative approach & knowledge. This means good quantitative skills, as well as confidence in the usage of statistical methods and their interpretations, focusing on improved decision-making abilities based on quantitative sources.</p> <p>II. COURSE OBJECTIVES: The students will try to learn:</p> <ol style="list-style-type: none"> I. Mathematical model and solve the real life system with limited constraints by applying LPP. II. Transportation and assignment concepts to implement supply chain management III. PERT and CPM techniques to plan, schedule, and control projects. IV. Alternatives using decision-making under risk and uncertainty and game theory. V. The simulation process in queuing theory to evaluate the system. <p>III. COURSE OUTCOMES: After successful completion of the course, students will be able to:</p> <p>CO 1: Explain the importance of operation research to assess complicated issues in the face of uncertainty.</p> <p>CO 2: Use a linear programming mathematical model to solve real-world issues and get the best results.</p> <p>CO 3: Solve the assignment model to reduce total cost or increase total profit.</p> <p>CO 4: Classify various transportation models in order to allocate resources efficiently.</p> <p>CO 5: Examine the PERT chart and its concepts to assess the amount of time and resources required to run a project.</p> <p>CO 6: Determine the critical path for making the project plan, management, and analysis.</p> <p>CO 7: Demonstrate how to use decision theory to select the best alternative.</p> <p>CO 8: Design a decision tree for creating and handling non-linear data sets.</p> <p>CO 9: Analyze the queuing models to determine the optimization of ques.</p> <p>CO 10: Classify differences in queuing models to study the delays caused by waiting in line.</p> <p>IV. SYLLABUS:</p>								
UNIT-I	LINEAR PROGRAMMING						Classes:08	
Operation Research – Introduction, Models, Areas of Application. Linear Programming (L.P.): Mathematical Formulation of L.P. problem. Graphical Method and Special Cases: Alternative optimal solutions, Unbounded solutions, Infeasible solutions. Simplex Method – Concept of slack, surplus & artificial variables. Manual solutions of L.P.P. upto 3 iterations. Minimization & Maximization Problems.								
UNIT-II	ASSIGNMENT AND TRANSPORTATION MODEL						Classes:08	
Algorithm for solving assignment model, Hungarian's method for solving assignment problem, variations of assignment problem: multiple optimal solutions, Maximization case in assignment problem. Unbalanced assignment problem and travelling salesman problem. Transportation problem: mathematical model of transportation problem, methods for finding initial feasible solution: northwest corner Method, least cost method, Vogel's approximation method, test of optimality by Modi Method, various transportation Problems like unbalanced supply and demand and degeneracy.								

UNIT-III	NETWORK ANALYSIS	Classes:10
<p>Introductory concepts in network analysis: Programme Evaluation and Review Technique (PERT) / Critical Path Method (CPM) and their managerial applications; Computations in PERT networks finding earliest times, latest times and floats for events and activities.</p> <p>Probability considerations in PERT networks; Elementary PERT/ CPM – Cost Analysis, Time-cost tradeoff in network analysis.</p>		
UNIT-IV	DECISION THEORY	Classes: 10
<p>Introduction, ingredients of decision problems, decision making under uncertainty, cost of uncertainty, under risk, under perfect information, decision tree, construction of decision tree.</p>		
UNIT-V	QUEUING THEORY	Classes: 09
<p>Queuing structure and basic components of a queuing model, distributions in queuing model, Differences in queuing model with FCFS, queue discipline, single and multiple service station with finite and infinite population.</p>		
Text Books:		
<ol style="list-style-type: none"> 1. Stacho, Juraj. "Introduction to operations research", 10thEdition, 2021. 2. Stevenson J. William, "Operations Management", Tata McGraw-Hill, 13thEdition, 2017 3. Barry Render, Ralph M. Stair, Jr., Michael E. Hanna, "Quantitative Analysis for Management", Pearson Education, 11thEdition, 2017. 4. B Mahadevan, "Operations Management: Theory and Practice", Pearson Education India, 3rdEdition, 2015. 5. Anderson, Sweeney, Williams, Camm, Martin. "Quantitative Methods for Business", 12thEdition, Cengage Learning, 2013. 6. J.K. Sharma, "Operations Research-Theory and applications", MacMillan, 5thEdition, 2013. 7. R. Panneerselvam, "Operations Research", PHI, 3rd revised Edition, 2012. 		
Reference Books:		
<ol style="list-style-type: none"> 1. Anand Sharma, "Quantitative Techniques for Decision Making", HPH, 1stEdition, 2010. 2. Prem Kumar Gupta, "Introduction to Operations Research", S.Chand, 5thEdition, 2012. 3. K.L Schgel, "Quantitative Techniques and Statistics", 3rdrevised Edition, 2012. 4. Hillier / Lieberman, "Introduction to operations research", TMH, 9thEdition, 2012. 5. Hamdy A Taha, "Operations Research: An Introduction", Pearson, 9thEdition, 2013. 		
Web References:		
<ol style="list-style-type: none"> 1. http://web.itu.edu.tr/topcuil/ya/OR.pdf 2. http://textofvideo.nptel.iitm.ac.in/112106134/lec1.pdf 		
E-Text Books:		
<ol style="list-style-type: none"> 1. https://www.goodreads.com/shelf/show/operations-research 2. https://books.google.co.in/books/about/Operations_Research.html?id=P9h42uyE72YC 3. https://www.bbau.ac.in/dept/UIET/EME-601%20Operation%20Research.pdf 4. http://eprints.stiperdharmawacana.ac.id/51/1/%5BJohn_Buglear%5D_Quantitative_Methods_for_Business_%28BookFi%29.pdf 5. https://www.scribd.com/document/441357778/N-D-Vohra-Quantitative-techniques-in-management-Tata-McGraw-Hill-2006-pdf 		