COURE CONTENT

QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS								
II Semester: MBA								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
CMBD19	**Core**	**4**	**0**	**-**	**4**	40	60	100
Contact Classes: 45	**Tutorial Classes: 00**	**Practical Classes: Nil**				**Total Classes: 45**		
Prerequisite: Basic concepts of management								

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.

II. COURSES OBJECTIVES:

The students will try to learn:

I. The mathematical model and solve the real life system with limited constraints by applying LPP.
II. The transportation and assignment concepts to implement supply chain management
III. The PERT and CPM techniques to plan, schedule, and control projects.
IV. Alternatives using decision-making under risk and uncertainty and game theory.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

CO1 Apply quantitative techniques to solve and optimize real world problems for business decisions.
CO2 Develop a fundamental application tool in industry for better solutions of computational experiments and analysis.
CO3 Make use of operation research to optimize the solution.
CO4 Summarize the work in teams, technical knowledge, and in time task completion.
CO5 Develop a report that describes, assess and evaluate the data solving techniques to recommendations based on results.
CO6 Design mathematical models for problems that arise in various disciplines.

IV. COURSE CONTENT:

MODULE - I: LINEAR PROGRAMMING (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. up to 3 iterations. Minimization & Maximization Problems.

MODULE - II: ASSIGNMENT ANDTRANSPORTATON MODEL (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.

MODULE - III: NETWORK ANALYSIS (10)
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; Probability considerations in PERT networks; Elementary PERT/ CPM – Cost Analysis, Time-cost tradeoff in network analysis.

MODULE - IV: DECISION THEORY (10)
Introduction, ingredients of decision problems, decision making under uncertainty, cost of uncertainty, under risk, under perfect information, decision tree, construction of decision tree.

MODULE - V: QUEUING THEORY (09)
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.

V. TEXTBOOKS:

1. Stacho, Juraj. "Introduction to operations research", 10th edition, 2021.
2. Stevenson J. William, “Operations Management”, Tata McGraw-Hill, 13th edition, 2017
3. Barry Render, Ralph M. Stair, Jr., Michael E. Hanna, “Quantitative Analysis for Management”, Pearson Education, 11th edition, 2017.
4. B Mahadevan, “Operations Management: Theory and Practice”, Pearson Education India, 3rd edition, 2015.
5. Anderson, Sweeney, Williams, Camm, Martin. “Quantitative Methods for Business”, 12th edition, Cengage Learning, 2013.
6. J.K. Sharma, “Operations Research-Theory and applications”, MacMillan, 5th edition, 2013.
7. R. Panneerselvam, "Operations Research", PHI, 3rd revised edition, 2012.

VI. REFERENCE BOOKS:

1. Anand Sharma, “Quantitative Techniques for Decision Making”, HPH, 1st edition, 2010.
2. Prem Kumar Gupta, “Introduction to Operations Research”, S.Chand, 5th edition, 2012.
3. K.L Schgel, “Quantitative Techniques and Statistics”, 3rd revised edition, 2012.
4. Hillier / Lieberman, "Introduction to operations research", TMH, 9th edition, 2012.
5. Hamdy A Taha, "Operations Research: An Introduction", Pearson, 9th edition, 2013.

VII. Web References:

1. http://web.itu.edu.tr/topcuil/ya/OR.pdf
2. http://textofvideo.nptel.iitm.ac.in/112106134/lec1.pdf

VIII. E-Text Books:

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