QUANTATITIVE ANALYSIS FOR BUSINESS DECISIONS

III Semester: MBA

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
CMBB29	**Elective**	4	-	-	4	30	70	100

Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil	Total Classes: 45

OBJECTIVES:
The course should enable the students to:

I. Apply the quantitative methods for business decision making.
II. Maintain fundamental applications in industry and public sector to face uncertainties and scarcity of resources.
III. Facilitate mathematical and computational modelling of real decision making problems including the use of modelling tools.
IV. Familiarize with the design implementation and analysis of computational experiments.

COURSE OUTCOMES (COs):

1. Apply quantitative techniques to translate a real-world problem for business decisions using Mathematical tools.
2. Understand the topic of linear programming problem and its use in practical problems for optimization.
3. Develop fundamental applications of those tools in industry and public sector in contexts involving uncertainty and scarce or expensive resources.
4. Illustrating with the design implementation and analysis of computational experiments.
5. Understand the concept of operation research to optimize the solution.
6. Ability to work in a team: specifically to solve larger problems, communicate technical knowledge, partition a problem into smaller tasks, and complete tasks on time.
7. Facilitate to identifying, accessing, evaluating, and interpreting information and data in support of assignments, projects, or research.
8. Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.
9. Develop and understand mathematical models for problems that arise in various disciplines.

UNIT-I	NATURE AND SCOPE OF OPERATION RESEARCH	Classes: 08

Origins of operation research, applications of operation research in different managerial areas, defining a model, types of model, process for developing an operations research model, practices, opportunities and short comings of using an operation research model.

UNIT-II	ASSIGNMENT MODEL	Classes: 10

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, travelling salesman problem, simplex method for solving assignment problem.

UNIT-III	LINEAR PROGRAMMING METHOD	Classes: 11

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, variation transportation, Problems like unbalanced supply and demand, degeneracy and its resolution.

Structure of LPP, assumptions of LPP, Application areas of LPP, guidelines for formulation of LPP, formulation of LPP For different areas, solving of LPP by graphical method: simplex method, two phase method, big-M method, converting primal LPP to dual LPP, limitations of LPP.

UNIT-IV	DECISION THEORY	Classes: 08

Introduction, ingredients of decision problems, decision making under uncertainty, cost of uncertainty, under risk, under perfect information, decision tree, construction of decision tree.

UNIT-V	QUEUING THEORY	Classes: 08

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.

Text books

1. J.K. Sharma, "Operations Research", Theory and applications, MacMillan, 5th Edition, 2013.
2. R. Pannerselvam, "Operations Research", PHI, 3rd Revised Edition, 2012.

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", 9th Edition, TMH, 2012.
5. Hamdy A Taha, "Operations Research: An Introduction", Pearson, 9th Edition, 2013.

Web References

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

E-Text Books

1. https://www.goodreads.com/shelf/show/operations-research
2. https://books.google.co.in/books/about/Operations_Research