

Teaching Lesson Plan

Semester-VI

MJ 13: QUANTITATIVE TECHNIQUES FOR BUSINESS DECISION

Lecture hours: 60

OBJECTIVES: To familiarise the learners with basic mathematical tools, emphasising applications to business and economic situations.

SN	Subject and Objectives	Lectures Hrs	Methodology	Evaluation Mode
Unit-I	Introduction of Quantitative Techniques	10Hrs		
	Overview of Quantitative Techniques and Operations Research for Decision Making, Classification of Quantitative Techniques, Scope & Importance of Operations Research, Model/Phases in Operations Research, Limitation of Operations Research or Quantitative Techniques.	10	PPT, Illustrations	Q & A, Assignments
Unit-II	Linear Programming	10Hrs		
	Formulation of Linear programming problems (LPPs) with more than two variables. Solution of LPPs by simplex method - maximization and minimization cases. The dual problem: Formulation, the relationship between Primal and Dual LPP, Primal and Dual solutions (excluding mixed constraints LPPs). The economic interpretation of the dual.	10	PPT, Illustrations	CIA
Unit-III	Assignment and Transportation	10Hrs		
	Assignment Problem, Hungarian Method of Assignment, Unbalanced Assignment Problems, Transportation Problem, Method to find the initial solution: North-west corner method, least cost Method, Vogel's approximation method, Finding optimal solution: Stepping-stone method and Modified Distribution Method.	10	PPT, Illustrations	Q & A, Assignments
Unit-IV	Game Theory and Replacement theory	10Hrs		
	Introduction of Game Theory, Two-Person Zero-Sum Game, Pure Strategies (Minimax and Maximin Principles): Game with a saddle point. Mixed Strategies, Rule of Dominance. Introduction of Replacement, Replacement of items whose efficiency deteriorates with time.	10	PPT, Illustrations	Q & A, Assignments
Unit-V	Project Management: PERT and CPM	10Hrs		
	Introduction, Basic Difference PERT and CPM, Phases of Project Management, PERT/CPM Network Components and Precedence Relationships, Critical Path Analysis, Critical Path, Project Scheduling with	10	PPT, Illustrations	Q & A, Assignments

	uncertain activity times, Estimation of project completion time.			
Unit-VI	Inventory Management and Queuing Theory	10Hrs		
	1. Concepts of inventory management; Inventory models – classical EOQ, EOQ with price breaks, EOQ model for production runs, planned shortage model- deciding optimum safety stock and reorder level, Probabilistic Model; Techniques of selective control. 2. Introduction of Queuing Model, Objects of the Queuing Theory, Elements of a Queuing System, Some Queuing Models: Fixed Arrival and Fixed Service Time, Random Arrivals, Erlang's Method in context of Queuing Models, Queuing models in case of Multiple Service station, Limitations of Queuing Theory.	10	PPT, Illustrations	Q & A, Assignments

Reference Books:

1. Anthony, M., & Biggs, N. (1996). Mathematics for Economics and Finance. Cambridge: Cambridge University Press.
2. Budnick, P. (1986). Applied Mathematics for Business, Economics, & Social Sciences. New York: McGraw Hill Publishing.
3. Dowling, E. (2011). Introduction to Mathematical Economics. New York: McGraw Hill Publishing.
4. Hamdy A. Taha, (2017) Operational Research, Pearson.
5. Kapoor, VK Operations Research: Quantitative Techniques for Management, Sultan Chand and Sons.
6. Levin R. I., Rubin D.S., Stinson J.P., Gardner E.S. Jr., Quantitative Approaches to Management, McGraw Hill International Editions.
7. Vohra, ND, & Arora, Hitesh, Quantitative Techniques in Management, McGraw Hill.
8. Tulsian, P.C. & Pandey, V. —Quantitative Techniques Pearson Education, India.

Prepared by: Dr. Fr. Roshan Baa, SJ