



PROGRAM	Master of Business Administration
SEMESTER	2
COURSE TITLE	Quantitative Techniques for Decision Making
COURSE CODE	04MB0206
COURSE CREDITS	3
COURSE DURATION	42 Hrs (42 sessions of 60 minutes each)

COURSE OUTCOME

- ❖ Develop the skill and ability to express a given real-life situation into a linear programming format and solve them.
- ❖ Formulate and Apply relationship between linear programming and its dual problem and distinguish between linear and integer programming problems.
- ❖ Understand special cases of Linear Programming Problem and Apply transportation methods in appropriate situations to numerous business problems.
- ❖ Apply assignment methods in appropriate situations to resource allocation problems.
- ❖ Analyze the problems of decision making under probabilistic situations and Evaluate decision trees to solve business problems.

COURSE CONTENTS:

Unit No	Unit / Sub Unit	Sessions
I	<p>Linear Programming Problem (LPP) 1 – Formulation:</p> <p>Introduction to Linear Programming, Requirements, Assumptions and Limitations and Application of LPP, LPP Model Formulation – Maximization Problems and Minimization Problems (Max 4-Variables and 4-Constraints), General Structure of Linear Programming Problems</p> <p>Linear Programming Problem (LPP) 2 – Graphical Method:</p> <p>Concept of Feasible Region, Solution of LP Problems using Graphical Method, Maximization and Minimization Problems (Max 4-Constraints),</p> <p>Special Cases in LPP – Multiple or Alternate Optimum Solutions, Redundant Constraint, Unbounded Solution, and Infeasible Solution</p> <p>Note: Constraints of all types (Less than type, Greater than type and combination of both the types) should be covered</p>	10
II	<p>Dual LP Problem and Sensitivity Analysis of LP Solution:</p> <p>Introduction to concept of Dual LPP, Relation between Primal Problem and Dual LPP, Economic Interpretation of Dual LPP, Conversion of Primal Problem to Dual LPP, Solution of LPP and Dual LPP using QM for Windows software, Introduction to Post-Optimal Sensitivity Analysis, Sensitivity Analysis on objective coefficients (c_j) and resources coefficients (b_i) using QM for Windows software</p> <p>Integer Linear Programming Problem:</p>	10

	<p>Introduction, Types of Integer programming problems (Pure-Integer, Mixed-Integer and Binary-Integer problems) and their applications, Model Formulation, Graphical solution of ALL-integer LPP, Solution of Integer LPP using MS Excel and QM for Windows software</p> <p>Note: DUAL LPP with Max 3-Variables and 4-constraints, Mixed-constraints and Unrestricted Variables</p>	
III	<p>Transportation Problem (TP)</p> <p>Introduction, Structure of TP, Solution of TP – Initial Feasible Solution (IFS) using Lowest Cost Method, Vogel’s Approximation Method (VAM) and Maximum Demand (MD) Method, Finding Optimal Solution using MODI Method, Types of Transportation Problem – Balanced and Unbalanced Problems, Minimization and Maximization Objectives, Case of Degeneracy and Prohibited or Restricted Route, Unique Optimum Solution and Multiple Optimum Solutions</p> <p>Note: Max 5X5 Transportation Matrix, MODI Method - Maximum One Iterations after IFS, Degeneracy to be covered at Conceptual Level, not to be Included in Numerical Problem Solution. Use of QM for Windows software to solve problems.</p>	8
IV	<p>Assignment Problem (AP)</p> <p>Introduction, Structure of AP, Solution of AP using Hungarian Method, Types of Assignment Problems - Balanced and Unbalanced Problems, Minimization and Maximization Objectives, Restricted Assignment, Unique Optimum Solution and Multiple Optimum Solutions, Travelling Salesman Problem (TSP)</p> <p>Note: Max 5X5 Assignment Matrix, Maximum Three Iterations after Row and Column Minimization. Use of QM for Windows software to solve problems.</p>	6
V	<p>Decision Theory:</p> <p>Introduction, Structure of Decision-Making Problem – The Decision-maker, Acts and Events, Payoff and Payoff Matrix, Regret or Opportunity Loss Table, Decision-Making under Risk – Expected Monetary Value (EMV), Expected Value of Perfect Information (EVPI), Expected Opportunity Loss (EOL), Decision-Making under uncertainty – Maximax and Maximin Payoff Criterion, Minimax Regret Criterion, Criterion of Equal Likelihood, Hurwitz α-Criterion</p> <ul style="list-style-type: none"> ● Decision Tree Analysis: Single Stage Decision Problems. <p>Note: Use of QM for Windows software to solve problems.</p>	8

EVALUATION:

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

	Component	Weightage
A	Continuous Evaluation Component (10% Assignments / Quizzes / Class Participation)	20% (C.E.C.)
B	Internal Assessment	30% (I.A.)

C	End-Semester Examination	50% (External Assessment)
---	--------------------------	---------------------------

SUGGESTED READINGS:
Text Books:

Sr. No	Author/s	Name of the Book	Publisher	Edition & Year
T-01	J K Sharma	Operations Research	TRINITY Press	Latest Edition
T-02	Barry Render, Ralph M. Stair, Jr.	Quantitative Analysis for Management	Pearson	Latest Edition

Reference Books:

Sr. No	Author/s	Name of the Book	Publisher	Edition & Year
R-01	N D Vohra	Quantitative Techniques in Management	Tata McGrawHill	Latest Edition
R-02	Hamdy Taha	Operations Research	Pearson	Latest Edition
R-03	Anderson, Sweeny, Williams	An Introduction to Management Science	Cengage Learning	Latest Edition
R-04	V K Kapoor	Operations Research	Sultan Chand and Sons	Latest Edition
R-05	Hiller and Liebermann	Introduction to Operations Research	Tata McGraw Hill	Latest Edition