GUJARAT UNIVERSITY
K.S.SCHOOL OF BUSINESS MANAGEMENT
[Five Years (Full Time) M.B.A. Integrated Degree Course]
FOURTH Year M.B.A. (SEM-VII)
KS_M_ 472
QUANTITATIVE TECHNIQUES FOR MANAGEMENT – I

3 credit course

Objective:

The course deals with the mathematical concepts required in the resolution of managerial decision problems. The focus of the course is to cover basic mathematics and statistics relevant for management.

The objective is threefold:

– to impart the rigor of theory, to develop skills in analyzing problems and to inculcate the attitude of implementing well thought out solutions to decision problems.

Module – 1 **[20%]**

- **Mathematics of Finance**

  Interest, Annuity, Depreciation, Internal rate of return, Leasing, Capital expenditure, Bonds, Amortization of loan, Related managerial problems

Module – 2 **[20%]**

- **Game Theory**

  Introduction, Terminologies: Players, Strategy, Pure strategy, Mixed strategy, Payoff matrix, Maximin principle, Minimax principle, Saddle point, Value of the game, Two persons zero sum game

  - Two-Persons zero sum game
    - game with pure strategy
    - game with mixed strategy
    - dominance property
    - linear programming approach for game theory
      (Formulation of L.P.P. for m*n and solution only for 3*3 matrix)

  NOTE: Graphical method for 2*n or m*2 game is not included in the syllabus.

- **Network Models**

  Introduction to network models: Shortest-Path model, Minimum spanning tree problem, Maximal flow problem

  - Problem solving of
    - Shortest path problem using Dijkstra's algorithm
    - Minimum spanning tree problem using Kruskal's algorithm
    - Maximum flow problem using MFP algorithm

Module – 3 **[20%]**

- **Integer Programming Problem**

  Introduction, Integer programming problem formulation, Cutting-Plane algorithm for pure and mix integer problems, Related examples

- **Goal Programming Problem**

  Introduction, Goal programming with a single goal, Goal programming with multiple goals, Non-Preemptive goal programming, Preemptive goal programming, Modified simplex method for goal programming, Related examples

Module – 4 **[20%]**

- **PERT and CPM**
  Introduction to PERT and CPM networks, Rules of network construction, Redundancy in precedence relationships, Scheduling the activities: earliest and latest times, determination of ES and EF times, determination of LS and LF times, determination of the critical path, project completion time, determination of the Float: total, interfering, free and independent, crashing of activity, PERT, Difference between PERT and CPM, Related examples

Module – 5 **[20%]**

- **Time series Analysis**
  Introduction to time series, Components of time series, Methods to find trend, seasonal variation and cyclic variation, Related examples

- **Forecasting Methods**
  Introduction, Usage, Forecasting based on different methods: Time series (using linear and second degree parabola equations only), Regression, Exponential smoothing etc. Related examples.

No of lectures in semester: 40 – 45 Hours (approximately)

Assignment: Minimum 3 Assignments

Evaluation Pattern:

Continuous Evaluation	30%
Mid-Sem. Exam	20%
End-Sem. Exams	50%

Reference Books

- Mathematics for Management-An introduction by M. Raghavachari; Tata McGraw-Hill Education
- Business Mathematics by Padmalochan Hazarika; S. Chand Publishing
- Business Mathematics by J. K.Singh; Himalaya Publishing House
- Quantitative Techniques in Management by N. D. Vohra; Tata McGraw-Hill Education
- Operations Research by Hamdy A. Taha; Pearson Prentice Hall
- Operations Research by J. K. Sharma; Macmillan India Limited
- Operations Research by Prem Kumar Gupta, D. S. Hira; S. Chand, Higher Aademic
- Operations Research by R. Panneerselvam; Prentice Hall India
- Comprehensive Statistical Methods by P. N. Arora, Sumeet Arora, S. Arora; S. Chand Publishing
- Statistics for Management by Levin & Rubin; Pearson Education India
- Statistics for Business & Economics by Anderson, Sweeney, Williams; Cengage Learning
- An Introduction to Management Science: Quantitative Approach to Decision Making by Anderson, Sweeney, Williams; West Pub. Co.