

Programme..Master of Commerce (MCom)

MCM5103 QUANTITATIVE TECHNIQUES FOR DECISIONMAKING

Course Code	MCM5103	Semester	I
Course Title	<i>QUANTITATIVE TECHNIQUES FOR DECISION MAKING</i>		
Credits	4	Type	Core

This course shall have 3 lecture hours, 2 practicals, 1 tutorial.

This is a Skill based, employability based course.

Course Objective

To understand why statistics is important for making business decisions and be able to explain the merits and limitations of various statistical techniques and to apply quantitative techniques to solve variety of business problems

Learning Objectives

- To understand Probability theory and its distribution.
- To develop a deeper understanding of correlation and regression.
- Demonstrate a sound knowledge of fundamentals of statistics and statistical techniques.
- To understand the meaning and process of hypothesis testing including one-sample and two-sample tests.
- To become aware of the concepts in sampling, sampling distributions and estimation.
- To understand the relevance of quantitative techniques in business decision making
- To be able to understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.
- To understand the importance of CPM and PERT techniques for project management

Course Structure

UNIT I

Probability : Basic concepts, Definition, Relative Frequency, Laws of Probability, Addition and Multiplication Theorem, Probability Distributions: – Binomial, Poisson and Normal Distribution, Bernoulli process- Other probability distributions – beta distribution – exponential distribution.

UNIT II

Hypothesis Testing: One and Two-sample Tests: General methodology of hypothesis testing. One and two-tailed tests. Type I and Type II Errors. Power of a test. Calculation and use of p-value. One Sample Tests: Hypothesis testing of means when the population standard deviation is known and when it is not known. Hypothesis tests concerning proportions. Z test, T-Test, Paired t test, Independent sample t-test, Chi square test, F-tests

Two-sample Tests: Tests for difference between means – when population standard deviations are known,

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and when they are not known. Inferences about difference between two means for matched samples. Testing of difference between two proportions.

UNIT III

Operations Research: Development of O.R, Types of models, Different tools used in O.R, Constructing the model, Limitations of O.R. Essential features of the OR approach. Quantification of factors. Linear Programming: Meaning, Basic concepts, uses and applications, Graphical method of solution to L.P.P, Advantages and Limitations of Linear Programming. Introduction to Foundation mathematics and statistics, LP and allocation of resources, LP definition, Linearity requirement, Linear Programming – Simplex Method for Maximizing, Sensitivity Analysis

UNIT IV

Network Models: PERT and CPM – Introduction, Techniques, Network Components, Precedence, Events, Activities, Errors and Dummies, Critical Path Analysis, Float, Probabilities in PERT Analysis, Project Time calculation, Project Crashing, Time, and Cost Considerations.

UNIT V

Correlation and Regression Analysis: Simple, multiple and partial correlation analysis. Rank correlation. Simple and Multiple linear regression analysis (involving up to three variables). Multiple regression analysis using MS Excel.

Practicals

- Prepare a model and schedule a program using PERT and CPM and analyse its cost.
- Compute Critical Path and time for a project based on product launching.

Skills

- Analytical skills in driving the duration and cost of a project
- Analysis types of errors and hypothetical tests in research
- Numerical skills in developing probability distribution

Learning/Course Outcomes

- Able to use statistical techniques to collect and analyse data.
- Develop greater familiarity with Probability theories and statistical testing.
- Carry out a simple sample survey, analyse the results and present the findings to the class.
- Understand relevance & need of quantitative methods for making business decisions.

Books for Reference

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1. Aczel, Amir D., and Sounderpandian, J., Complete Business Statistics, Tata McGraw Hill Publishing
2. Anderson, Sweeney, Williams, Quantitative Methods for Business, Thomson.
3. Bharadwaj R. S., Business Statistics, Excelbooks.
4. Clemen, Robert, Making Hard Decisions: An Introduction to Decision Analysis, South Western CollegePub.
5. Gupta S.P. (2009), Statistical Methods, Sultan Chand, NewDelhi
6. Hammond, J.S. and Keeney, R.L. and Raiffa, H., Smart Choices: A Practical Guide to Making Better Decisions, Broadway.
7. Kanti Swarup, Gupta.P.K. & Man Mohan, operations Research, S.Chand & Sons.
8. Kothari C R: Quantitative Techniques, New Delhi: Vikas Publishing
9. Levin R I and Rubin D S: Statistics for Management, Prentice Hall of India, New Delhi
10. N.D .Vohra, Quantitative techniques in managements, Tata MC Grawhill.
11. Raiffa, Howard, Decision Analysis: Introductory Readings on Choices Under Uncertainty, McGraw-Hill
12. Rajiv Agarwal, Network Analysis & Operations Research, MIT Press.
13. Ravindran, D. T. Phillips and James J. Solberg (2005): Operations Research-Principles and Practice, John Wiley & Sons.
14. Richard I Levin, & C. Atkinson Kirkpatrick, Quantitative Approaches to Management, McGraw-Hill.
15. S C Gupta, Fundamentals of Statistics, Himalaya publication house.
16. Srivastava, Shenoy and Sharma, Quantitative Techniques for Managerial Decision- making, New Age International, 2006.
17. Taha, Hamdy (2003), Operations Research, (USA: Macmillan Publishing Company)
18. Wayne L. Winston, Practical Management Science: spreadsheet modeling and applications