Programme..Master of Commerce (MCom)

MCM5103 STATISTICAL ANALYSISAND QUANTITATIVE TECHNIQUES

Course Code	MCM5103	Semester	I
Course Title	STATISTICAL ANALYSISAND QUANTITATIVE TECHNIQUES		
Credits	4	Type	Core

Learning/Course Objective

- To understand Probability theory and Probability distribution.
- To develop a deeper understanding of correlation and regression.
- To undergo statistical tests to interpret results.
- 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.

Course Structure

UNIT I:

Probability Theory: Probability – Classical, relative, and subjective probability: Addition and multiplication probability models; Conditional probability and Baye's theorem Probability Distributions: Binomial, Poisson, and normal distribution, their characteristics and applications.

UNITII:

Statistical Decision Theory: Introduction to Decision Theory - Decision environment; Expected profit under uncertainty and assigning probabilities; Utility theory.Pay-off and Loss tables – Expected value of pay-off – Expected value of Perfect Formation – Decision Tree approach to choose optimal course of action – Criteria for decision – Mini-max, Maxi-max, Minimizing Maximal Regret and their applications.

UNIT III:

Sampling and Data Collection: Sampling and sampling (probability and non-probability) methods; Sampling and non-sampling errors; Law of Large Number and Central Limit Theorem; Sampling distributions and their characteristics.

UNIT IV:

Statistical Estimation and Testing: Point and interval estimation of population mean, proportion and variance; Statistical testing – hypotheses and errors; Sample size; Large and small sampling tests –Z-tests, T tests, and Ftests.Non Parametric Tests: Chi-square tests; Sign tests Wilcoxon Signed – Rank tests; Wald – Wolfowitz tests; Kruskal – Wallis tests.

UNIT V:

Introduction to Decision Theory: Pay-off and Loss tables – Expected value of pay-off – Expected value of Perfect Formation – Decision Tree approach to choose optimal course of action – Criteria for decision – Mini-max, Maxi-max, Minimizing Maximal Regret and their applications- Case problems. Depicting Cost and Revenue behavior – Differentiation of Cost/Revenue functions to derive Marginal Cost and Marginal Revenue –Decisions on Minimizing

Costs and Maximizing output/profits- Partial and Multiple Correlation and Regression- Interpretation of Multiple Regression Tables- Case problems.

Learning/Course Outcome

- 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:

1. KantiSwarup, PK Gupta and Man Mohan, Operations Research, Sultan Chand & Sons, 2013.
2. David R. Anderson, et al, An Introduction to Management Science: Quantitative Approaches to Decision Making, Cengage Learning, 2008.
3. Lucey, Quantitative Techniques Cengage Learning Business Press, 2002
4. Sharma, Operations Research: Theory and Applications, MacMillan.
5. Richard I Levin, & C. Atkinson Kirkpatrick, Quantitative Approaches to Management, McGraw-Hill.
6. Srivastava, Shenoy and Sharma, Quantitative Techniques for Managerial Decision-making, New Age International, 2006.
7. N.D. Vohra, Quantitative Techniques in Management, Tata McGraw-Hill Education, 2010
8. Levin, Richard I. and David S Rubin: Statistics for Management, Prentice Hall, Delhi 2009
9. Gupta S.P. Statistical Methods, Sultan Chand, New Delhi 2009
10. BS Kenblock –Fundamentals of Statistics, 3rd edition, Michael Sullivan Solution manual
11. Hooda, R.P: Statistics for Business and Economics, Macmilla 3rd edition, New Delhi.(2004)
12. Heinz, Kohleer: Statistics for Business & Economics, Harper Collins, New York.(2002)

Theory and Problem: - 40:60