

## **MT-331 PROBABILITY AND STATISTICS**

**Introduction:** Types of data & variables, presentation to data, object, classifications, Tabulation, Frequency distribution & their types, Graphical representation, Simple & Multiple Bar diagrams, Pie-Diagram, Histogram, Frequency Polygon, Frequency Curves.

**Measure of Central Tendency and Dispersion:** Statistical Averages, Median, Mode, Quartiles, Range, Moments, Skewness & Kurtosis, Quartile Deviation, Mean Deviation, Standard Deviation, Variance & its coefficient.

**Probability:** Set Theory, Basic concepts, Permutation & Combination, Definitions of probability Applying set theory to probability, Probability axioms, some consequences of the axioms, Conditional probability, Independence, Baye's rule.

**Random Variables:** Introduction, Discrete & Continuous random variables, Random Sequences and transformations, Probability distribution, Probability density function, Distribution function, Mathematical expectations, Moment Generating Function (M.G.F.).

**Probability Distributions:** Introduction, Discrete probability distributions, Binomial, Poisson, Hypergeometric & Negative binomial distributions. Continuous probability distribution, Uniform, Exponential, Gamma, Weibull & Normal distributions & their practical significance.

**Sampling and Sampling Distributions:** Introduction, Population, Parameter & Statistic, Objects of Sampling, Questionnaire Designing, Sampling Techniques, Sampling & Non-Sampling Errors, Random Sampling, Probability and Non Probability Sampling, Sampling with & without replacement, Simple Random Sampling, Stratified Random Sampling, Systematic Sampling, Cluster Sampling, Sampling Distribution of Mean, Standard Errors, Central Limit Theorem

**Curve Fitting:** Introduction, fitting of a first and second degree curve, fitting of exponential and logarithmic curves related problems, Principle of least squares, Introduction to Time series.

**Regression and Correlation:** Properties of Least Square, Simple Linear Regression, Non Linear Regression, iMultiple Regression, Estimates of Regression parameters, Confidence Limits & Test of Significance, Choice of a Regression Model, Correlation, Multiple and Partial Correlation, Coefficient of Determination.