

3rd Semester

Course Name: BUSINESS STATISTICS (Multi Disciplinary)

Credit 3

Unit 1: Statistical Data and Descriptive Statistics

- Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross-sectional data
- Measures of Central Tendency i. Mathematical averages including arithmetic mean, geometric mean and harmonic mean. Properties and applications. ii. Positional Averages Mode and Median (and other partition values including quartiles, deciles, and percentiles).
- Measures of Variation: absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance d. Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis

Unit 2: Probability and Probability Distributions

- Theory of Probability. Approaches to the calculation of probability; Calculation of event probabilities. Addition and multiplication laws of probability (Proof not required); Conditional probability
- Expectation and variance of a random variable, Probability distribution of random variable.
- Probability distributions: Binomial, Poisson and Normal distribution (probability function and properties (proof not required)) simple problems related to the distributions

Unit 3: Simple Correlation and Regression Analysis

- Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (Proof not required). Rank Correlation, Interpretation of various values of correlation co-efficient.
- Regression Analysis: Principle of least squares and regression lines, Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients;

Unit 4: Sampling Concepts, Sampling Distributions, Estimation and testing of Hypothesis

Sampling: Populations and samples, Parameters and Statistic, Census vs Sampling. Sampling methods (including Simple Random sampling, Stratified sampling, Systematic sampling, Judgment sampling, and Convenience sampling)

Concept of Sampling distributions and Estimation: Point and Interval estimation of means (large samples) and sample proportion. Characteristics of a good estimation. Testing of hypothesis- concepts of Null hypothesis, alternative hypothesis, level of significance, test of significance, one-tailed and two-tailed test and errors in testing hypothesis.

Unit 5: Time Series Analysis

Components of time series; Additive and multiplicative models; Trend analysis: Fitting of trendline using principle of least squares – linear case. Determination of trend by semi-average and moving average. Uses of Time Series analysis.

Suggested Readings :-

- Gupta, S.C, Fundamentals of statistics – Himalaya Publishing House.
- Murray, R Spiegel, Larry J. Stephens, Narinder Kumar. Statistics (Schaum's Outline Series)
- Hazarika, Padmalochan, Business Statistics – S.Chand
- Bhowal, M.K. Fundamentals of Business Statistics (Asian Books Private Limited)