DSC, DSE or GE

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Statistics for Business Management **GE:7.4**	**4**	**3**	**1**	**0**	**Pass in XII**	**NIL**

Learning Objectives

The course aims to develop amongst the learners the ability to understand the concepts of statistics and apply them in business situations by summarizing, analysing and interpreting quantitative information.

Learning outcomes

After completion of the course, learners will be able to:

1. Analyse the basics of statistics and its contribution in the ancient to modern era.
2. Interpret and explain various descriptive properties of statistical data.
3. Identify probability rules, concepts relating to random variables, and answer questions in the context of business using statistical decision theory.
4. Analyse the underlying relationship between variables and perform predictive analysis using regression models.
5. Evaluate the trends and tendencies over a period through time series analysis.
6. Apply index numbers to real life situations.
7. Create decision trees to analyse business decision problems.

Course Contents

Unit 1: Introduction to Statistics (9 hours)

Meaning and scope of statistics, Collection of data, classification and tabulation, diagrammatic and graphical representation.

Ancient Indian Contributions to Statistics, Indian Statistical Heritage in Modern Times, Integration of Indian Knowledge System with Modern Statistics.

Unit 2: Descriptive Statistics (9 hours)

Measures of Central Tendency: Concept and properties of averages including Arithmetic mean, Median and Mode. Measures of Dispersion: An overview of Range, Quartile Deviation and Mean Deviation; Standard deviation; Variance and Coefficient of variation. Computation and significance of Skewness.

Unit 3: Probability and Statistical Decision Theory (9 hours)

Probability: Theory and approaches to probability; Probability Theorems: Addition and Multiplication; Conditional probability and Bayes' Theorem. Expectation and variance of a random variable.

Statistical Decision Theory: Ingredients of decision problem, Probabilistic criterion for decision making under risk or uncertainty, Non-probabilistic criterion for decision-making under risk or uncertainty, Decision Tree Analysis.

Unit 4: Statistical Analysis

Part A: Simple Correlation and Regression Analysis (9 hours)

Correlation Analysis: Meaning and types of Correlation; Correlation Vs Causation; Pearson's coefficient of correlation (computation and properties); Rank correlation.

Regression Analysis: Principle of least squares and regression lines; Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients

Part B: Time Series Analysis and Index Numbers (9 hours)

Time Series: Components of time series; Additive and Multiplicative models. Trend analysis; Fitting of linear trend using principle of least squares. Shifting of Origin and Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa.

Index Numbers: Meaning and uses of index numbers. Construction of Index numbers: Methods of Laspeyres, Paasche and Fisher's Ideal index. Construction and Utility of Consumer Price Indices; BSE SENSEX, and NSE NIFTY.

Exercises

The learners are required to

1. Observe and apply the concepts of statistics in real life situations.
2. Practice basic calculations in statistics using spreadsheets and try to use it for solving subject related assignments.
3. Conduct a small primary research/survey in groups and analyse the data. (Examples: Buying behaviour, Motivation, Stress, Brand aspects, Sales Projections, Impact of advertisements etc).
4. Conduct a statistical experiment to estimate the probability of any event occurring in future.
5. Analyse the relationship between different factors affecting the demand for any product and make predictions using regression analysis.
6. Analyse the price movement in any equity stock using trend analysis and construct a hypothetical index that is representative of large cap stocks listed on NSE.
7. Create a decision tree to solve a simple problem such as deciding what to wear based on the weather.

Essential/ Recommended readings

- Anderson, D. R., Sweeney, D. J., Williams, T. A, Camm, J. D., Cochran, J. J., Fry, M. J., & Ohlmann, J. W. (2023). Statistics for Business & Economics, Cengage Learning India Pvt. Ltd.
- Douglas, A. L., William, G. M., & Samuel, A. W. (2024). Basic Statistics for Business & Economics. Mc-Graw-Hill Education.