STT 512: Statistics for Management

Course Title: Statistics for Management
Course Code: STT 512
Credit Hours: 3
Semester: First
Lecturer Hours: 45

Course Objectives

The objective of this course is to impart in students the basic concepts and skills of using statistical tools in solving management problems. This course will help students understand the process of defining, collecting, organisating, visualizing and analyzing data by applying appropriate statistical tools designed for business decision making. In addition, this course will provide knowledge of proper use of inferential statistics in making rational decision based upon sample data.

Course Description:

This course deals with the statistical methods and tools required for decision making in contemporary business environment. Topics include descriptive statistics and numerical measures, statistical inferences, hypothesis tests and nonparametric methods, analysis of variance, correlation analysis, regression models and forecasting techniques.

Learning Outcomes

By the end of this course, the students will be able to:

- discuss and explain what statistics is and how it is used in the field of management,
- explore the numerical data by using SPSS software,
- use the concept of probability in the business decision,
- use the concept of sampling, estimation and hypothesis testing in various functional areas of an organization,
- analyze the relationship among variables and classify them as per the domain and
- use forecasting technique in the business and economy.

Course Contents

The course deals with the following topics:

Unit 1: Introduction to Statistics **LH 8**

Descriptive vs. inferential statistics; statistics in management and other areas of study; variable and its type; data and types of data; data measurement scale, data collection; Organizing and visualizing variables: visualizing numerical variables, visualizing categorical variables; numerical descriptive measures: central tendency, variation and shape; exploring numerical data.

Unit 2: Probability and Sampling **LH 8**

Concept of probability; conditional probability; Bayes' theorem; discrete probability distribution: Binomial and Poisson distribution with their measure characteristics and applications; continuous probability distribution: normal distribution and their applications; sampling techniques and sampling distribution of mean and proportion; central limit theorem; estimation of sample size.

Unit 3: Inferential Statistics **LH 14**

Theory of estimation; point estimation and interval estimation and their interpretations; hypothesis testing: fundamentals of hypothesis testing, algorithm for testing of hypothesis, traditional and p-value approaches of hypothesis test for decision making; parametric test statistic: Z-statistic for mean and proportion test, one sample t-test, independent t-test, paired t-test and their assumptions; F-statistic: variance-ratio test, one-way Analysis of Variance (ANOVA), concept of two-way ANOVA, assumptions of F-test; non-parametric test statistic: chi-square test statistic for goodness of fit and independence of attribute, Wilcoxon sign ranked test, Mann Whitney U test and Kruskal Wallis test.

Unit 4: Relationship among Variables and Classification Technique **LH 10**

Introduction; correlation analysis; estimation using regression line; limitations and errors; finding multiple regression equation (with 2 independent variables); coefficient of multiple determination; standard error of estimate; multiple regression with dummy variable; diagnostics of regression analysis; stepwise regression; factor analysis; autocorrelation.

Unit 5: Forecasting **LH 5**

Introduction; types of forecasting methods; measurements of errors in forecasting; components of time series; smoothing techniques; exponential smoothing method.

Note: In each unit of the course students will be guided manually along with SPSS software.

Required Textbook and Materials:

Prescribed Text Book:

David M. Levine, Kathryn A. Szabat & David F. Stephan. (2013). ***Business Statistics: A First Course.*** 7th edition, Pearson Education.

Suggested References:

Douglas A. Lind, William G. Marchal & Samuel A. Wathen, (2008). ***Statistical techniques in Business and Economics.*** 13th edition, Tata McGraw hill, India.

Gupta, S.C. (2007). ***Fundamentals of Statistics.*** 6th Edition, Sultan Chand & Sons, New Delhi.

Groebner, D. F., Patrick W. Shannon, Phillip C. Fry & Kent D. Smith. (2008). ***Business Statistics: A Decision-Making Approach.*** 7th Edition, Pearson, Singapore**.**

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