

STATISTICS

This course provides a basis for understanding the applications of statistics in various disciplines. The techniques of gathering and recording data are studied along with finding mean, median, mode, mid-range, and standard deviation. Probability theory and distributions are used to predict outcomes and test hypotheses. Graphing calculators and computers are used for organizing and displaying data, for computing, and for modeling the occurrence of events.

OBJECTIVES

1. To develop the ability to use statistical formulas and perform statistical calculations;
2. To provide a basis for understanding applications for statistics in various disciplines;
3. To enable the student to use probability theory and distributions to predict outcomes and to test hypotheses
4. To demonstrate the use of graphing calculators and computers for organizing and displaying data and for modeling events.

SCOPE:

I. Organizing Data

- A. Population, sample, levels of measurement, random sample
- B. Graphs, histogram, frequency distribution, stem-and-leaf plot

II. Averages and Variation

- A. Measures of central tendency: mean, median, mode
- B. Measures of variance: range, variance, standard deviation
- C. Grouped data, percentiles, box plots

III. Elementary Probability Theory

- A. Probability, relative frequency, sample space
- B. Experimental or theoretical probability, Law of Large Numbers
- C. Probability rules for compound events, mutually exclusive events, complements
- D. Permutations and combinations

IV. Probability Distributions

- A. Random variable (discrete or continuous)
- B. Mean and standard deviation of probability distribution and of binomial distribution

V. Normal Distributions

- A. Normal curve, standard units, z-score
- B. Areas under standard normal curve or any normal curve
- C. Normal approximation to binomial distribution

VI. Introduction to Sampling Distributions

- A. Sampling distributions, Central Limit Theorem

VII. Introduction to Estimation

- A. Point estimate, interval estimate, error of estimate
- B. Critical values, degrees of freedom, confidence interval
- C. Choosing the sample size

VIII. Hypothesis Testing and Inferences

- A. Tests involving a population mean (large and small samples)
 - B. Tests involving a proportion
 - C. Tests involving a population variance (Chi Square)
 - D. Level of significance,
- IX. Regression and Correlation
- A. Scatter diagrams
 - B. Linear regression, least-squares line
 - C. Linear correlation coefficient

TEXT: Elementary Statistics, 7th Edition, Triola