

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY  
BUS 221 - BUSINESS STATISTICS I (3 CR.)**

**Course Description**

Covers frequency distributions, descriptive measures, probability concepts, probability distribution, sampling, estimation, hypotheses testing for means and proportions. Lecture 3 hours per week.

**General Course Purpose**

This course is planned to meet the business statistics requirements of business degree programs. It is designed, therefore, for the student who plans to transfer to a four-year college or university to receive a baccalaureate degree in business administration. It is the first of two sequential courses of three credit hours each. Both courses will emphasize the analysis of business and economic data for business decision-making. In this course, the student is introduced to the subject of business statistics to include the need for quantitative analysis in business, the basic procedures in problem solving, and the sources and types of data used by business firms. The student will acquire knowledge of certain basic terminology in descriptive and inferential statistics. Emphasis will be placed upon the use of the computer to perform statistical analysis.

**Course Prerequisites/Corequisites**

Prerequisite: MTH 161 or division approval. An ability to read, comprehend, analyze material written at a college level. An ability to write and present ideas using standard English.

**Course Objectives**

Upon completion of the course, the student should be able to achieve the objectives as identified under each topic below:

- A. Organizing and Displaying data
  - 1. organize ungrouped data into a frequency distribution
  - 2. construct different types of graphs using statistical software
  
- B. Descriptive Measures
  - 1. arrange ungrouped data into an array, and determine the mean, median, mode, percentiles and quartiles
  - 2. for a given data, compute the range, variance, and standard deviation
  - 3. recognize the shape of the distribution—symmetric and asymmetric
  - 4. identify the modal class, median class, and class width of a given frequency distribution
  - 5. generate summary statistics using statistical software
  
- C. Basic Probability Concepts
  - 1. define experiment, sample space
  - 2. list elementary events
  - 3. construct Venn diagram and probability matrices for two sets probability problems
  - 4. solve problems involving use of addition rule
  - 5. define independent events and dependent events
  - 6. solve problems involving use of multiplication rule
  - 7. compute conditional probabilities
  
- D. Discrete Probability Distributions
  - 1. compute expected  $X$  (mean) and variance of a discrete random variable
  - 2. state the required conditions for the use of the binomial probability distribution
  - 3. compute expected  $X$  (mean) and variance of a binomial distribution
  - 4. with the use of formula and table, solve problems involving binomial distribution
  - 5. recognize the conditions under which it is appropriate to use the Poisson distribution
  - 6. solve problems involving the Poisson distribution

- E. Continuous Probability Distribution
1. describe the characteristics of normal distribution and standardized normal distribution
  2. solve problems finding areas under a normal curve using a z-table
  3. approximate normal to the binomial distribution
  4. demonstrate the use of the normal distribution in business problem solving
- F. Sampling and Sampling Distributions
1. distinguish between probability and non-probability sampling
  2. recognize what is meant by simple random, systematic, stratified, and cluster samples
  3. define sampling distribution of the mean, and state the central limit theorem and its significance
  4. write the formulas for and compute the standard error of the mean and the standard error of the proportion
- G. Confidence Intervals for Single Population Mean and Proportion
1. know the difference between point estimates and interval estimates
  2. calculate confidence intervals for mean and proportion
  3. compute appropriate sample size
  4. construct confidence interval using statistics package
- H. Hypothesis Testing for Single Population Mean and Proportion
1. state null and alternative hypothesis
  2. calculate cut-off point using z-table, t-table
  3. interpret the tradeoff between type I and type II error
  4. calculate observed value using appropriate distribution (z-distribution, t-distribution)
  5. reach conclusion of the testing
  6. use statistical package to conduct hypothesis testing using p-value

### **Major Topics to be Included**

- Organizing and displaying data
- Measures of central tendency and variability
- Basic probability concepts and problems
- Use of probability distributions: Binomial and Poisson, and use of the normal distribution
- Sampling and sampling distributions
- Confidence intervals for the population mean and proportion using normal distribution
- Basic hypothesis testing
- Statistical analysis (descriptive statistics) using statistical package

### **Optional Topics**

- A. Bayes' Theorem: Revising prior estimates
- B. Hypergeometric Distribution
- C. Uniform distribution