

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
BUS 224 – STATISTICAL ANALYSIS FOR BUSINESS (4 CR.)**

Course Description

Discusses the business statistics topics typically covered in business degree programs. Covers frequency distributions, descriptive measures, probability concepts, probability distributions, sampling, hypotheses testing for means and proportions, Chi-square distribution, simple linear regression and briefly, multiple linear regression. 4 hours lecture.

General Course Purpose

This course is formed from Business Statistics I (BUS 221) and II (BUS 222) to meet the business statistics requirements of a business degree program. It is designed, therefore, for a student who plans to transfer to a four-year college or university to receive a baccalaureate degree in business field. The student will acquire knowledge of certain basic terminology and methods in descriptive and inferential statistics.

Course Prerequisites/Corequisites

Prerequisite: Completion of MTH 161 with a C or higher.

Course Objectives

Upon completing the course, the student will be able to:

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Identify Data types

- a) Quantitative: continuous or discrete
- b) Qualitative: nominal or ordinal
- c) Measurement scales: interval or ratio

Organizing and Displaying Data

- a) organize ungrouped data into a frequency distribution and create frequency and relative frequency histograms
- b) construct different types of graphs from a spreadsheet data range (e.g., bar graph, pie graph, line graph etc.)

Descriptive Measures

- a) arrange ungrouped data into an array, and determine the mean, median, mode, percentiles and quartiles
- b) compute the range, variance, and standard deviation
- c) recognize the shape of the distribution—symmetrical and asymmetrical
- d) identify the modal class, median class, and class width of a given frequency distribution
- e) generate summary statistics using Excel

Basic Probability Concepts

- a) define experiment, sample space
- b) list elementary events
- c) construct Venn diagram and probability matrices for two sets probability problems
- d) define independent events and dependent events
- e) solve problems involving use of addition rule and multiplication rule
- f) compute conditional probabilities

Discrete Probability Distributions

- a) compute expected value and variance of a discrete distribution

- b) state the required conditions for the use of the binomial distribution
- c) compute expected value and variance of a binomial distribution
- d) with the use of formula and table, solve problems involving binomial distribution
- e) recognize the conditions under which it is appropriate to use the Poisson distribution
- f) solve problems involving the Poisson distribution

Continuous Probability Distribution

- a) describe the characteristics of normal distribution and standardized normal distribution
- b) solve normal curve problems using table
- c) normal approximation to the binomial distribution problems
- d) demonstrate the use of the normal distribution in business problem solving

Sampling and Sampling Distributions

- a) distinguish between probability and non-probability sampling
- b) recognize random sampling techniques
- c) understand the sampling distribution of sample means

Confidence Intervals for Single Population Mean and Proportion

- a) know the difference between point estimates and interval estimates
- b) calculate confidence intervals for mean and proportion
- c) compute appropriate sample size
- d) construct confidence interval using statistics package

Hypothesis Testing for Single Population Mean and Proportion

- a) formulate null and alternative hypotheses
- b) understand the important of controlling α
- c) determine the critical value using z-table, and t-table
- d) calculate the test statistic using appropriate distribution
- e) write conclusion in word

Simple Linear Regression and Correlation

- a) create and interpret scatter diagrams
- b) develop a regression model by the method of least squares
- c) check model assumptions using residual plots and normal probability plot
- d) measure the relationship among data through the calculation of the coefficients of determination and correlation

Business Spreadsheets

- a) Designating and working with ranges
 - Selecting a data range
 - Navigating through a data range
 - Printing a data range
- b) Functions and formulas
 - Creating formulae
 - Moving and copying functions and formulae
 - Using the order of precedence in formulae
 - Using relative, absolute and mixed references
 - Using Lookup (VLookup and HLookup) functions
 - Using math and statistical functions
 - Using logical and financial functions
 - Using Text functions
 - Creating nested functions
- c) Spreadsheet formatting
- d) What-If Analyses
 - Performing a What-If Analysis with Goal Seek

- Using the Scenario Manager to analyze data
- Finding Optimal Solutions with Solver

- e) Working with data in tables
- Sorting and filtering a list
- Creating data tables, generating subtotals, and creating summaries
- Creating and manipulating PivotTables

- f) Working with multiple worksheets
- g) Elements of macros
 - Recording a macro
 - Stopping a macro
 - Running a macro
- Applying appropriate security levels within Excel to control macro execution.

- h) Spreadsheets graphics
 - Creating charts
 - Editing chart data and objects
 - Moving and copying charts

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
- Simple Regression Analysis
- Functions and formulae
- Spreadsheets graphics
- Elements of macros
- Performing What-If Analyses