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: MTH 161 or division approval.

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

<u>Major Topics to be Included</u>

- 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