

QUANTITATIVE ANALYSIS 233 COURSE GUIDE

Basic Business Statistics

Text: Essentials of Modern Business Statistics (3rd Edition) – Anderson, Sweeney, & Williams

Learning Objectives: To provide each student with an introduction to statistical analysis; and to impress upon the students how statistical thinking plays an important role in everyday life and how statistical concepts and methods are used in the business world. Analytical thinking in a managerial environment will be stressed.

Specific Learning Standards emphasized in this course include:

Communication Skills – uses standard English grammar in written form; reads with comprehension.

Critical Thinking -- analyzes information; utilizes logic; recognizes patterns and forms conclusions; recognizes and evaluates assumptions, theses, and support of arguments.

Technological Proficiency -- demonstrates knowledge and use of current technology for problem solving.

Research Skills -- applies scientific method to problem solving; utilizes basic statistical analysis.

Course Specifics: Course prerequisite is MATH 125 or a finite mathematics course. Given that probabilistic concepts and some common probability distributions are covered in MATH 125, little class time will be devoted to these topics. Also, all students are expected to have completed a computer literacy course that emphasizes the use of Excel. Hence, students will be expected to complete assignments using Excel without specific directions from the instructor.

The following indicates the learning objectives in each chapter that should be given the most emphasis in lecture, problem assignments, and testing. Other learning objectives may be covered at the instructor's discretion.

<i>Chp#</i>	<i>Chapter Title</i>	<i>Learning Objectives to be Emphasized</i>
1	Data and Statistics	<ul style="list-style-type: none">• Understand terms used in statistical inference – population and sample.• Recognize the difference between a population parameter and a sample statistic.
3	Descriptive Statistics: Numerical Measures	<ul style="list-style-type: none">• Be able to calculate and define the relative advantages and disadvantages of common measures of location; specifically mean, median, and mode.• Be able to calculate and define the relative advantages and disadvantages of common measures of variability; specifically range, variance, standard deviation, and coefficient of variation.• Be able to use Excel to calculate the measures.
4	Introduction to Probability	<ul style="list-style-type: none">• Grasp basic requirements for assigning probabilities.• Understand events and basic probability.• Be able to compute probabilities using the addition law and understand mutually exclusive events.• Understand conditional probability and independent events and compute probabilities using the multiplication law.

5	Discrete Probability Distributions	<ul style="list-style-type: none"> • Understand the concept of a random variable. • Be able to calculate and explain the expected value and variance of a discrete random variable. • Be able to calculate probabilities using the Binomial distribution and understand when it is appropriate to use. • Be able to calculate probabilities using the Poisson distribution and understand when it is appropriate to use. • Be able to calculate probabilities using the Hypergeometric distribution and understand when it is appropriate to use.
6	Continuous Probability Distributions	<ul style="list-style-type: none"> • Be able to calculate probabilities using the Uniform distribution and understand when it is appropriate to use. • Be able to calculate probabilities using the Normal distribution and understand when it is appropriate to use.
7	Sampling and Sampling Distributions	<ul style="list-style-type: none"> • Understand simple random sampling and point estimation. • Understand the sampling distribution of a sample mean, sample proportion, and the Central Limit Theorem.
8	Interval Estimation	<ul style="list-style-type: none"> • Be able to construct confidence intervals for the population mean. • Be able to construct confidence intervals for the population proportion.
9	Hypothesis Tests	<ul style="list-style-type: none"> • Understand Type I and Type II errors. • Be able to perform tests of hypotheses for a population mean—one-tailed and two-tailed tests. • Be able to perform tests of hypotheses for a population proportion—one-tailed and two-tailed tests.
10	Comparisons Involving Means	<ul style="list-style-type: none"> • Be able to construct confidence intervals for the difference between two population means. • Perform tests of hypotheses for the difference in two population means.
11	Comparisons Involving Proportions and a Test of Independence	<ul style="list-style-type: none"> • Be able to construct confidence intervals for the difference in two population proportions. • Be able to perform tests of hypotheses for the difference between two population proportions. • Be able to perform Chi-Square goodness of fit test and test of independence.
12	Simple Linear Regression	<ul style="list-style-type: none"> • Be able to estimate the regression equation using ordinary least squares. • Understand model assumptions. • Be able to calculate the coefficients of determination and correlation. • Be able to perform tests for a significant linear relationship—using a t-test and the ANOVA procedure. • Be able to calculate confidence intervals for a mean response and prediction intervals for an individual response. • Be able to run and interpret Excel regression output.