WILMINGTON UNIVERSITY
COLLEGE OF BUSINESS
BASIC COURSE INFORMATION

COURSE NUMBER: RES 7105
COURSE TITLE: Statistics for Research

I. LEARNING OUTCOMES AND GOALS

GOAL A: Understand descriptive statistics and be able to present the information both graphically and numerically.

Learning Outcomes:
A-1 Understand data variables and measures and be able to organize data for easy presentation.
A-2 Understand and be able to calculate measures of central tendency such as mean, median, and mode both by hand and with Excel.
A-3 Be able to develop frequency distributions and describe and use measures of skewness.

GOAL B: Develop an understanding of the concept of probability and the characteristics of discrete probability distributions.

Learning Outcomes:
B-1 Be able to understand and express the concepts of probability and solve problems using these concepts.
B-2 Understand the properties of a normal distribution of data and be able to recognize and test for data distributions that are not normal.
B-3 Describe discrete probability distributions and be able to calculate expected values and variance of them.
B-4 Be able to understand and use the binomial distribution.

GOAL C: Understand continuous probability distributions and sampling distributions and be able to apply those concepts to developing and using sampling methods.

Learning Outcomes:
C-1 Describe continuous probability distributions, and be able to calculate the mean, variance and standard deviation of these distributions.
C-2 Understand the standard normal probability distribution (z values) be able to apply it to solve statistical problems.
C-3 Understand the value of sampling, describe methods to select samples, and define and construct sampling distributions of the mean.
C-4 Understand and be able to apply the central limit theorem to sampling problems.

GOAL D: Understand the concept of statistical error and how to use hypothesis testing in statistical practice.

Learning Outcomes:
D-1 Understand, be able to describe, and be able apply the concepts of confidence intervals to statistical samples.
D-2 Develop an understanding of hypothesis testing, when it is useful to solving statistical problems, and the concepts of one-sample tests.

D-3 Develop an understanding of how hypothesis testing is used to solve statistical problems.

GOAL E: Develop an understanding of statistical inferences about means, proportions and population variances and how to apply goodness of fit and independence tests to problems using these concepts.

Learning Outcomes:
E-1 Develop an understanding of hypothesis testing as applied to two-sample tests for both population means and proportions, and for paired and independent observations.

E-2 Understand and be able to apply the concepts of analysis of variance, the F distribution, and ANOVA tests.

E-3 Understand the chi-square distribution and how it applies to goodness of fit.

GOAL F: Develop of understanding of linear regression, determine how to test for statistical significant of regression, and how to apply regression methods to solve statistical problems.

Learning Outcomes:
E-1 Understand dependent and independent variables as applied to linear regression.

E-2 Be able to calculate and interpret coefficients of correlation and determination, and construct and interpret confidence and prediction intervals for the dependent variable.

E-3 Develop an understanding of linear regression and how to apply it to statistical problem solving using Excel.

GOAL G: Develop of understanding of multiple regression, determine how to test for statistical significant of regression, and how to apply regression to solve statistical problems. Develop an understanding of a few common nonparametric methods.

Learning Outcomes:
E-1 Understand how to use multiple independent variables as applied to regression analysis.

E-2 Understand how to determine both the global fit of the data and the fit for each independent variable.

E-3 Understand how to use Excel for multiple regression analysis and interpretation of statistical problems.

E-4 Understand how to apply several tests using nonparametric methods to statistical problems.

SUPPLEMENTAL OBJECTIVES:

The student will demonstrate the ability to understand and communicate statistical concepts with a high level of proficiency. These proficiencies will be demonstrated through quizzes, exams, class discussion and exercises, and case study analysis and presentation.
II. ATTRIBUTES OR RATIONALE

The proper understanding and application of statistical techniques is an important element of academic research and publications in business and the social sciences. Many research studies in these academic areas are quantitative or contain quantitative elements that require statistical analysis and interpretation. A good understanding of statistical techniques is required to properly understand and interpret these studies, develop valid research strategies and proposals, and to correctly interpret and present research data and information.