STA 2023 – STATISTICS FOR BUSINESS & ECONOMICS

Course Syllabus (Revised July 2017)
Prerequisites: High School Algebra
Terms Offered: Fall, Spring, Summer
Text: Statistics for Business and Economics, McClave, Benson, and Sincich; 13th ed.

Coverage:

Chapter 1 - Sections 1, 2, 3, 5, 6, 7 (section 4 – optional)
Chapter 2 - Sections 1, 2, 3, 4, 5, 6, 10 (sections 7, 8, 9 – optional) Chapter 3 - Sections 1, 2, 3, 4, 5, 6
Chapter 4 - Sections 1, 2, 3, 4*, 5, 6 (*Poisson only)
Chapter 5 - Sections 1, 2, 3, 4
Chapter 6 - Sections 1, 2, 3, 4, 5
Chapter 7 - Sections 1, 2, 3, 4, 5, 6
Chapter 8** - Sections 1, 2, 4, 5 (**Time permitting)

Topics:

1. Statistics as a Science: Definition. Basic statistical terminology. Populations and samples. Types of data. Collecting data. Critical thinking with Statistics.

2. Descriptive Statistics: Statistical tables and graphs. Measures of Central Tendency. Measures of Variability. Interpreting the standard deviation. Measures of Relative Standing.

3. Probability: Role of probability in statistics. Experiments and experimental outcomes. Sample space, union, intersections, and complementary events. Mutually exclusive events, conditional probability, and independent events. Additive and Multiplicative Rules. Random Sampling.

4. Random Variables and Probability Distributions: Probability Distributions for discrete random variables, mean and variance. Binomial Distribution, mean, variance, use of binomial formula and probability tables. Poisson Distribution, mean, variance, use of Poisson formula. Continuous random variables. Normal Distribution, standard normal distribution. Tabulated areas under the standard normal curve. Applications.

5. Sampling Distributions: Parameters and sample statistics. Properties of Sampling Distributions – Unbiasedness and Minimum Variance. Sampling distribution of the sample mean. Central Limit Theorem. Sampling distribution of the sample proportion.

6. Inferences Based on a Single Sample - Estimation with Confidence Intervals: Identifying and estimating the target parameter. Confidence interval for a population mean: Normal (z) statistic. Confidence interval for a population mean: Student's t-statistic. Large-sample confidence interval for a population proportion. Determining the sample size.

7. Inferences Based on a Single Sample – Tests of Hypotheses: Elements of a test of hypothesis. Formulating hypotheses and setting up the rejection region. Observed Significance Levels. Tests of hypotheses about a population mean: Normal (z) statistic. Test of hypotheses about a population mean: Student's t- statistic. Large-sample test of hypothesis about a population proportion.

8. Inferences Based on Two Samples -Confidence Intervals and Tests of Hypotheses: Identifying the target parameter. Comparing two population means: independent sampling. Comparing two population proportions: independent sampling.