

STA 2122: Statistics for Behavioral and Social Sciences I

Syllabus/Course Description

Effective: January 2014

Prerequisite: High School Algebra

Terms Offered: Fall, Spring and Summer

Text: Statistics, 12th Edition customized for FIU, by James T. McClave and Terry Sincich

1. Statistics, Data, and Statistical Thinking? (Chapter 1)

Introduce Statistics as a branch of science. Explain the goal of Statistics. Statistical methods: descriptive and inferential. Discuss basic concepts: data, population, sample. census, surveys. Discuss types of data and data collection methods. Simple random sampling. Role of statistics in the scientific method.

2. Methods for Describing Sets of Data (Chapter 2: Sections 2.1-2.5 and 2.7)

Discuss frequency tables and graphs for qualitative and quantitative data. Measures of central tendency and variability for quantitative data. Measures of relative standing.

3. Probability (Chapter 3: Sections 3.1-3.6)

Discuss the basic concepts in probability: random experiment, sample space, sample points, events. Venn diagrams. Define the probability of an event. Compound events: intersection, union and complement of events. Probability rules. Mutually exclusive events. Conditional probabilities and independent events.

4. Discrete Random Variables (Chapter 4: Sections 4.1-4.4)

Define random variable. Introduce the types of random variables. Introduce probability distributions for discrete random variables. Compute the mean and variance of a discrete random variable. Give the characteristics of a binomial random variable, and use the binomial probability formula and table to find the probability for possible outcomes of a binomial experiment.

5. Continuous Random Variables (Chapter 5: Sections 5.1 and 5.3)

Introduce probability distributions for continuous random variables with emphasis on the normal distribution. Use the standard normal table to find probabilities and z-scores.

6. Sampling Distributions (Chapter 6: Sections 6.1 and 6.3)

Discuss the inferential statistics scheme. Define parameters, statistics and sampling distributions. Sampling distribution of the sample mean: Central Limit Theorem (discussion only, not exercises)

7. Inferences Based on A Single Sample: Estimation (Chapter 7: Sections 7.1-7.4)

Define confidence interval. Introduce the T-probability distribution. Compute confidence intervals for a population mean μ based on both large and small samples, and confidence intervals for a population proportion p for large samples.

8. Inferences Based on A Single Sample: Tests of Hypotheses (Chapter 8: Sections 8.1-8.3 and 8.5-8.6)

Discuss the elements of a test of hypothesis. Rejection region as a decision rule. Define Type I and Type II errors. Significance level of the test. Introduce p-value as the observed probability of type I error. Decision rule based on p-values (No computations of p-values is required). Perform tests of hypotheses about a single population mean based on both large and small samples, and about a single population proportion based on large samples.