

Course Outline and Objectives

ST 2113 Introduction To Statistics For The Behavioral Sciences.

Text: Elementary Statistics, sixth edition, Neil A. Weiss

Note: Effective with the Fall 2004 Semester

Chapter 1 The Nature of Statistics, Sections 1.1, 1.3, 1.4

After completing chapter 1, a student should be able to:

- Classify statistical studies as either descriptive or inferential.
- Identify the population and the sample in an inferential study.
- Explain what is meant by a representative sample.
- Describe simple random sampling
- (Assigned reading) systematic random sampling, cluster sampling, and stratified sampling.

MyMathLab: Enroll class and Use StatExplore to Load Data(This may occur after section 2.3 to avoid registering students that drop within the allowed time frame.)

2 hours

Chapter 2 Organizing Data, Section 2.1, 2.2, 2.3, 2.4, 2.5

After completing chapter 2, a student should be able to:

- Classify variables and data as either qualitative or quantitative.
- Distinguish between discrete and continuous variables and data.
- Identify terms associated with the grouping of data.
- Group data into a frequency distribution and a relative frequency distribution.
- Construct a grouped data table.
- Draw a frequency histogram and a relative-frequency histogram
- Draw a bar graph
- Construct ordered stem-and-leaf plots.
- Identify the shape and modality of the distribution of a data set.
- Understand the relationship between sample distributions and the population distribution.

MyMathLab: Use StatExplore to make Histogram and Stem-and-Leaf Plot

5 hours.

Chapter 3 Descriptive Measures, Section 3.1, 3.2, 3.3, 3.4, 3.5

After completing chapter 3, a student should be able to:

- Use and understand the formulas presented in this chapter.
- Explain the purpose of a measure of center.
- Obtain and interpret the mean, the median, and the mode(s) of a data set.
- Use and understand summation notation.
- Define, compute, and interpret
 - A sample mean, Range of a data set, Sample standard deviation.
- Explain the purpose of a measure of variation.
- Define percentiles and quartiles.
- Obtain and interpret the quartile, IQR, and five-number summary of a data set.
- Identify potential outliers.
- Distinguish between a parameter and a statistic.
- Understand how and why statistics are used to estimate parameters.
- Obtain and interpret z-scores.

MyMathLab: Use StatExplore to find Five-Number Summary; Boxplots

5 hours

1 hour review

1 hour test

Total for first third is **14 hours.**

Chapter 4 Descriptive Methods and Regression and Correlation, Section 4.1, 4.2, 4.4

After completing chapter 4, a student should be able to:

- Use and understand the formulas presented in this chapter.
- Define and apply the concepts related to linear equations with one independent variable.
- Obtain and graph the regression equation for a set of data point, interpret the slope of the regression line, and use the regression equation to make predictions.
- Understand the concept of extrapolation.
- Identify outliers and influential observations.
- Determine and interpret the linear correlation coefficient, r .
- Explain and apply the relation ship between the linear correlation coefficient and the coefficient of determination.

MyMathLab: Use StatExplore to make Scatter Diagram and perform Regression Analysis

4 hours.

Chapter 5 Probability and Random Variables, Section 5.1, 5.2, 5.3, 5.4, 5.5

After completing chapter 5, a student should be able to:

- Use and understand the formulas presented in this chapter.
- Compute probabilities for experiments having equally likely outcomes.
- Interpret relative frequency probabilities
- Construct and interpret Venn diagrams.
- Find and describe (not E), (A&B) and (A or B).
- Determine whether two or more events are mutually exclusive.
- Understand and use probability notation.
- State and apply the special addition rule.
- State and apply the complementation rule.
- State and apply the general addition rule.
- Determine the probability distribution of a discrete random variable.
- Construct a probability histogram
- Find and interpret the mean of a discrete random variable.

MyMathLab: Use StatExplore to perform a simulation to corroborate the frequentist interpretation of probability.

4 hours

Chapter 6 The Normal Distribution, Section 6.1, 6.2, 6.3,

After completing chapter 6, a student should be able to:

- Use and understand the formulas presented in this chapter.
- Explain what it means for a variable to be normally distributed or approximately normally distributed.
- Explain the parameters for a normal curve.
- Identify the basic properties and sketch a normal curve.
- Use Table II to find areas under the standard normal curve.
- Use Table II to find the z-score(s) corresponding to a specified area under the standard normal curve.
- Use and understand the z alpha notation
- Determine the percentage or probability for a normally distributed variable.
- State and apply the empirical rule.

3 hours.

1 hour review

1 hour test

Second third of course is **13 hours**

Chapter 7 The Sampling Distribution of the Sample Mean, Sections 7.1, 7.2, 7.3

- Use formulas presented in this chapter.
- Define the sampling error and explain the need for sampling distributions.
- Find the mean and standard deviation of the variable \bar{x} , given the mean and standard deviation of the population and sample size.
- State and apply the central limit theorem.
- Determine the sampling distribution of the sample mean when the variable under consideration is normally distributed.

MyMathLab: Use StatExplore to make the central limit theorem plausible through simulation.

3 hours

Chapter 8 Confidence Intervals for One Population Mean, Section 8.1, 8.2, 8.3, 8.4

- Use and understand the formulas presented in this chapter.
- Obtain a point estimate for a population-mean.
- Find and interpret a confidence interval for a population-mean when the population standard deviation is known.
- Compute and interpret the margin of error for the estimate of the population mean.
- Determine the sample size required for a specified confidence level and margin of error for the estimate of (μ) .
- Understand the difference between the standardized and studentized versions of the sample mean.
- State the basic properties of t-curves
- Find and interpret a confidence interval for a population mean when the population standard deviation is unknown.

MyMathLab: Use StatExplore to perform a one-sample t-interval procedure.

5 hours

Chapter 9 Hypothesis Tests for One Population Mean, Section 9.1, 9.2, 9.3, 9.4, and 9.5

- Use and understand the formulas presented in this chapter.
- Define the terms associated with hypothesis testing.
- Choose the null and alternative hypotheses
- Identify the test statistic, rejection region, non-rejection region and critical values for a hypothesis test.
- Obtain the P-value
- Perform a hypothesis test for a population mean when the population standard deviation is unknown.

MyMathLab: Use StateExplore to perform a one-sample t-test.

6 hours

1 hour review

1 hour test

Last third of the material is covered in **16 hours**.

1 hour for final exam review.

Total class hours 44