STA 2023 Course Schedule

Day/Date	Chapter	Topic and Learning Outcomes	Activities
Day 1 01/07	1.1 1.2 1.3	**Orientation, Introduction, Preview and Statistical Thinking** **Types of Data** • Define the terms data, statistics, parameter, sample, and population and identify them in context. • Define quantitative and categorical variables and labels and identify them in context.	**Text** 1.1/1.2 Statistical Thinking and Critical Thinking 1.3 Types of Data Read 1.1/1.2 p. 3 – 11 Read 1.3 p. 15 - 20
Day 2 01/09	2.1 2.2	**Frequency Distributions** • Construct and interpret frequency, relative frequency, and cumulative frequency distribution tables.	**Text** 2.1/2.2 Frequency Distributions Read pages 43 - 50 in the textbook.
	2.3	**Histograms** • Construct and interpret histograms	**Text** 2.3 Histograms 2.3: Read pages 54 - 58 in the textbook.
	2.4	**Stem and Leaf Plots** • Construct and interpret stem-and-leaf distributions.	**Text** 2.4 Graphs that Enlighten and Graphs that Deceive 2.4: Read pages 63 (Stemplots only) in the textbook.
Day 3 01/14	**3.1 /3.2**	**Measures of Central Tendency** • Calculate and interpret the mean, median, and mode of a set of numbers. • Calculate and interpret the weighted mean. • Determine the inter-relationships between the mean, median, and mode for skewed and symmetrical distributions. • Calculate and interpret the mean for a frequency distribution (optional).	**Text** 3.2 Measures of Center Read pages 79 - 90 in textbook.
	3.3	**Measures of Variation** • Calculate and interpret the range, variance, and standard deviation of a set of numbers. • Calculate and interpret the variance, and standard deviation for grouped data.	**Text** 3.3 Measures of Variation Read pages 96-104 in textbook.
	3.4	**Measures of Relative Standing** • Calculate and interpret quartiles and percentiles. • Calculate and interpret z-scores for a normal distribution.	**Text** 3.4 Measures of Relative Standing & Boxplots Read pages 112-118 in textbook.
Day 4 01/16	**4.1/4.2**	**Basic Concepts of Probability** • Apply the classical definition of probability. • Compute probabilities using the law of complementation.	**Text** 4.2 Basic Concepts of Probability Read pages 132 - 144 in textbook.
	4.3	**Addition Rule** • Compute probabilities using the laws of addition	**Text** 4.3 Addition Rule Read pages 149 - 152 in textbook.
	4.4/4.5	**The Multiplication Rules: Basics** • Compute probabilities using the laws of multiplication **Multiplication Rule: Complements and Conditional Probability** • Compute probabilities using the laws of multiplication. • Compute conditional probabilities.	**Text** 4.4 Multiplication Rule: Basics Read pages 156-163 in textbook. Read pages 168 - 171.

	4.6	**Counting** • Compute probabilities using the fundamental counting principle, permutations, and combinations.	**Text** 4.6 : Counting Read pages 175-180 in textbook.
Day 5, Day 6 **01/23** **01/28**		**Review of chapters 1, 2, 3 & 4**	
Day 7 **01/30**		**Test 1**	
Day 8 **02/04**	5.1/5.2	**Random Variables** • Differentiate between discrete and continuous random variables. • Given a distribution, decide whether it satisfies the requirements of a probability distribution. • Calculate the mean (expected value) and standard deviation for a given random variable. • Solve problems involving the expected value.	**Text** 5.2 Probability Distributions Read pages 195 - 206 in textbook.
Day 9 **02/06**	5.3 5.4	**Binomial Probability Distributions** • Decide whether a given distribution is binomial. • Calculate the binomial probability using the table or technology. • Calculate the binomial probability using the binomial formula. **Parameters for the Binomial Distribution** • Calculate the mean and standard deviation of a binomial distribution.	**Text** 5.3 Binomial Probability Distributions Read pages 210 - 217 in textbook. 5.4 Parameters for Binomial Distributions Read pages 223-225 in textbook.
Day 10 **02/11**		**Review Chapter 5**	
Day 11 **02/13**	6.2	**The Standard Normal Distribution** • Identify the properties of the standard and nonstandard normal distributions. • Use the standard and nonstandard normal distributions to determine probabilities. • Determine values in the standard and nonstandard normal distributions when given specific probabilities.	**Text** 6.2: The Standard Normal Distribution Read pages 237 - 249 in textbook.
	6.3	**Applications of the Normal Distribution** • Identify the properties of the standard and nonstandard normal distributions. • Use the standard and nonstandard normal distributions to determine probabilities. • Determine values in the standard and nonstandard normal distributions when given specific probabilities	**Text** 6.3 Applications of Normal Distributions Read pages 270-276 in textbook.
Day 12 **02/20**	6.5	**The Central Limit Theorem** • Explain the meaning of the Central Limit Theorem and its properties associated with the distribution of sample means. • Use the Central Limit Theorem to determine probabilities for distributions of sample means.	**Text** 6.5 Central Limit Theorem Read pages 278 - 285 in textbook.
Day 13 **02/25**	7.1/7.2	**Estimating a Population Proportion** • Determine point estimates for population proportions. • Construct confidence intervals for population proportions. • Determine the sample sizes necessary to estimate population proportions within a given error.	**Text** 7.2 Estimating a Population Proportion Read pages 317-331 in textbook.

Day 14 02/27	7.3	**Estimating a Population Mean: σ known** • Determine point estimates for the population mean. • Construct confidence intervals for the population mean. • Determine the sample sizes necessary to estimate population means within a given error.	**Text** 7.3 Estimating a Population Mean Read pages 347-349 in textbook.
	7.3 (cont.)	**Estimating a Population Mean: σ unknown** • Determine point estimates for the population mean. • Construct confidence intervals for the population mean. • Determine the sample sizes necessary to estimate population means within a given error.	**Text** 7.3 Estimating a Population Mean: σ Not Known Read pages 337-347 in textbook.
Day 15, Day 16 03/04 & 03/06		**Review Chapters 5, 6, 7**	
Day 17 03/11		**Test 2**	
Day 18 03/13	8.1/8.2	**Basics of Hypothesis Testing** • Determine the null and alternative hypotheses that would be used to test a claim. • Describe, analyze, and differentiate between Type I and Type II errors. • Determine the rejection region(s), and construct a sketch of the region(s).	**Text** 8.2 Basics of Hypothesis Testing Read pages 375-388 in the textbook (Focus on p value method throughout chapter 8.)
Day 19 03/18	8.3	**Testing a Claim about a Proportion** • Decide when to use the z statistic, and be able to determine the correct values for this statistics for various hypothesis tests. • Determine the p-value for a hypothesis test involving the z-test statistic. • Calculate the sample z test statistic for given sample data. • Decide whether to reject or fail to reject the null hypothesis based upon comparison of the test statistic value and the rejection region, or comparison of the p-value and the level of significance. • Translate the hypothesis test conclusion into a meaningful holistic answer to the original problem situation. • Students should be able use the traditional method to perform a hypothesis test by stating null and alternative hypotheses for a test, delineating the critical region for rejection of the null hypothesis, computing the appropriate test statistic, formulating the proper conclusion, and applying this structure to the tests of hypotheses regarding the proportion of a population by using a z statistic.	**Text** 8.3 Testing a Claim About a Proportion Read pages 393 – 401 in the textbook.
Day 20 3/20	8.4	**Testing a Claim about a Mean** • Decide when to use the z statistic, and be able to determine the correct values for this statistics for various hypothesis tests. • Determine the p-value for a hypothesis test involving the z-test statistic. • Calculate the sample z test statistic for given sample data. • Decide whether to reject or fail to reject the null hypothesis based upon comparison of the test statistic value and the rejection region, or	**Text** 8.4 Testing a Claim About a Mean: σ Known Read pages 406 – 413 in the textbook.

		comparison of the *p*-value and the level of significance. • Translate the hypothesis test conclusion into a meaningful holistic answer to the original problem situation. • Students should be able use the traditional method to perform a hypothesis test by stating null and alternative hypotheses for a test, delineating the critical region for rejection of the null hypothesis, computing the appropriate test statistic, formulating the proper conclusion, and applying this structure to the tests of hypotheses regarding the mean of a population by using a *z* statistic.	
Day 21 **03/25**		**Testing a Claim about a Mean: *σ* Not Known** • Decide when to use the *t* statistic, and be able to determine the correct values for this statistics for various hypothesis tests. • Determine the *p*-value for a hypothesis test involving the *t*-test statistic. • Calculate the sample *t* test statistic for given sample data. • Decide whether to reject or fail to reject the null hypothesis based upon comparison of the test statistic value and the rejection region, or comparison of the *p*-value and the level of significance. • Translate the hypothesis test conclusion into a meaningful holistic answer to the original problem situation. • Students should be able use the traditional method to perform a hypothesis test by stating null and alternative hypotheses for a test, delineating the critical region for rejection of the null hypothesis, computing the appropriate test statistic, formulating the proper conclusion, and applying this structure to the tests of hypotheses regarding the mean of a population by using a *t* statistic.	
Day 22 **03/27** **Day 23** **04/01**	9.3	**Inferences about Two Means: Independent Samples**. • Upon successful completion of this unit, the students should be able use the traditional method to perform a hypothesis test by stating null and alternative hypotheses for a test, delineating the critical region for rejection of the null hypothesis, computing the appropriate test statistic, formulating the proper conclusion, and applying this structure to the tests of hypotheses regarding the difference of two means when given two independent samples.	**Text** 9.3: Two Means: Independent Samples Read pages 447 – 456 in the textbook. (Skip confidence intervals.)
Day 24 **04/03**	9.4 11.3	**Inferences from Dependent Samples** • Upon successful completion of this unit, the students should be able use the traditional method to perform a hypothesis test by stating null and alternative hypotheses for a test, delineating the critical region for rejection of the null hypothesis, computing the appropriate test statistic, formulating the proper conclusion, and applying this structure to the tests of hypotheses regarding the differences between means using paired samples.	**Text** 9.4: Two Dependent Samples (Matched Pairs) Read pages 461-467 (skip confidence intervals) in the textbook. 11.3 Contingency Tables Read pages 547 – 552 (skip tests of homogeneity) in the textbook.

Day 25 04/08		**Contingency Tables** • Upon successful completion of this unit, the students should be able use the traditional method to perform a hypothesis test by stating null and alternative hypotheses for a test, delineating the critical region for rejection of the null hypothesis, computing the appropriate test statistic, formulating the proper conclusion, and applying this structure to the tests of hypotheses regarding the Chi-square test for independence of two variables.	
Day 26, Day 27 **04/10, 04/15**		**Review chapters 8, 9**	
Day 28 **04/17**		**Test # 3**	
Day 29 **04/22**	10.2 10.3	**Correlation and Regression** • Explain the meaning of and calculate "r", the sample linear correlation coefficient. • Construct and interpret scatter diagrams. • Conduct a test to determine if there is a significant linear correlation between two variables.	**Text** 10.2 Correlation Read pages 481 – 496 in the textbook. 10.3 Regression Read pages 503 – 509 in the textbook.
Day 30, Day 31 **04/24, 04/29**		**Final review**	
Day 32 **05/01**		**Final Exam**	

NOTE: Any changes in the Course Outline and Syllabus will be announced.