

Curriculum Guide Statistics

Unit 1: Introduction to Statistics

5 Lessons (1 week)

S#1

Objectives	Methods	Resources	Assessment
<p>The students will</p> <ol style="list-style-type: none">1. discuss the uses and abuses of statistics in our everyday lives.2. analyze the two major areas of statistics – descriptive statistics and statistical inference. Descriptive statistics involves collecting data and tabulating it in a meaningful way. Statistical inference involves making predictions based upon the sample data.3. distinguish between the entire collection called a population and a subset of the population called a sample.4. identify the levels of measurement (nominal, ordinal, interval and ratio) of a set of data.5. identify the types of samplings such as random, systematic, convenience, stratified, or cluster.6. identify the difference between an observational study and an experiment.7. identify the difference between a cross-sectional study, case study, and a cohort study.	<ul style="list-style-type: none">• teacher lecture using PowerPoint presentation• teacher working examples on the board• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005• PowerPoint Presentation provided by publisher	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

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Unit 2: Describing, Exploring, and Comparing Data

5 Lessons (1 week)

S#2, S#3

Objectives	Methods	Resources	Assessment
<p>The students will</p> <ol style="list-style-type: none"> 1. summarize data with frequency tables. 2. construct histograms, frequency polygons, dotplots, stem & leaf plots, pie charts and scatter diagrams. 3. calculate the mean, median, mode, midrange, range, variance, standard deviation of a set of data and draw conclusions based on the results of these computations. 4. apply the Empirical Rule to a set of data. 5. calculate the mean and standard deviation from a frequency table using the class marks. 6. convert an X value to a standard scale known as a Z score. 7. investigate data sets in order to understand their important characteristics by using EDA (Exploratory Data Analysis); the process of using statistical tools such as: graphs, measures of center and variation. 8. calculate the “5 Number Summary” 9. construct boxplots from the 5 number summary. 	<ul style="list-style-type: none"> • teacher lecture using PowerPoint presentation • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework 	<ul style="list-style-type: none"> • Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005 • PowerPoint Presentation provided by publisher 	<ul style="list-style-type: none"> • check homework • Quizzes • Tests • Oral response • Board work

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Unit 3: Probability

5 Lessons (1 week)

S#5

Objectives	Methods	Resources	Assessment
<p>The student will</p> <ol style="list-style-type: none"> 1. define probability. 2. apply the Law of Large numbers. 3. calculate probabilities by the Relative Frequency Approximation and by the Classical Approach. 4. calculate odds against and odds in favor, as well as payoffs in a gambling situation. 5. calculate the number of possible outcomes of an experiment. 6. apply the Addition Rule or the Multiplication Rule in probability. 7. identify events as mutually exclusive or not. 8. identify events as independent or dependent. 9. state the compliment of an event and of “at least one”. 10. apply the rules for complementary events. 11. apply the rules for Permutations and Combinations (may be covered in chap.4) 	<ul style="list-style-type: none"> • teacher lecture using PowerPoint presentation • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework 	<ul style="list-style-type: none"> • Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005 • PowerPoint Presentation provided by publisher 	<ul style="list-style-type: none"> • check homework • Quizzes • Tests • Oral response • Board work

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Unit 4: Probability

5 Lessons (1 week)

S#5, S#6

Objectives	Methods	Resources	Assessment
<p>The student will</p> <ol style="list-style-type: none"> 1. identify the random variable for each outcome of a procedure. 2. state the requirements for a Probability Distribution. 3. demonstrate how probability functions assign probabilities to the different values of the random variable. 4. distinguish between discrete and continuous random variables. 5. calculate the mean, variance and standard deviation of a probability distribution. 6. calculate the expected value of a discrete random variable. 7. state the requirements for a Binomial Distributions 8. find the binomial probability by using the Table A in the back of the book. 9. calculate the binomial probability from the binomial probability formula. 10. calculate the mean, variance, and standard deviation for the binomial distribution. 11. interpret the results as unusual if they lie outside the following limits: $\mu - 2 \sigma, \mu + 2 \sigma$ 	<ul style="list-style-type: none"> • teacher lecture using PowerPoint presentation • teacher working examples on the board • student guided practice of problems in book • cooperative learning groups • individual assistance • partner work • homework 	<ul style="list-style-type: none"> • Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005 • PowerPoint Presentation provided by publisher 	<ul style="list-style-type: none"> • check homework • Quizzes • Tests • Oral response • Board work

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Unit 5: Normal Probability Distributions

5 Lessons (1 week)

S#4, S#7

Objectives	Methods	Resources	Assessment
The student will: 1. calculate probabilities using standard normal procedures. 2. calculate probabilities using nonstandard normal procedures. 3. calculate the score for standard normal when given the probability/percent. 4. calculate the score for nonstandard normal when given the probability/percent. 5. apply the Central Limit Theorem when making predictions about and calculating probabilities for sample means. 6. apply the Finite Correction Factor when needed. 7. solve binomial probability problems by using the normal distribution as an approximation to the binomial distribution.	<ul style="list-style-type: none">• teacher lecture using PowerPoint presentation• teacher working examples on the board• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005• PowerPoint Presentation provided by publisher	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

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Unit 6: Estimates and Sample sizes

5 Lessons (1 week)

S#8

Objectives	Methods	Resources	Assessment
The student will: 1. calculate the best point estimate of a population, mean and proportion for a sample. 2. calculate the confidence interval for a proportion. 3. interpret confidence intervals about p and the mean. 4. construct confidence interval about the mean for large and small samples. 5. calculate the sample size required to estimate the mean of a population. 6. calculate the margin of error for a confidence interval 7. determine the appropriate Distribution (z or t). 8. calculate the point estimate and E from a confidence interval.	<ul style="list-style-type: none">• teacher lecture using PowerPoint presentation• teacher working examples on the board• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005• PowerPoint Presentation provided by publisher	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

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Unit 7: Hypothesis Testing

5 Lessons (1 week)

S#9

Objectives	Methods	Resources	Assessment
The student will; 1. state the claim, identify the null hypothesis and alternate hypothesis, and write them in symbolic form. 2. state the significance level and identify the critical value(s). 3. calculate the value of the test statistic, z or t. 4. state the conclusion of a hypothesis test in simple, nontechnical terms. 5. apply hypothesis testing procedures/methods for a claim about the mean of large or small samples. 6. apply hypothesis testing procedures/methods for a claim about a proportion. 7. apply hypothesis testing procedures/methods for a claim about a standard deviation or variance (optional).	<ul style="list-style-type: none">• teacher lecture using PowerPoint presentation• teacher working examples on the board• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005• PowerPoint Presentation provided by publisher	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

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Unit 8: Inferences from Two Samples

5 Lessons (1 week)

S#10

Objectives	Methods	Resources	Assessment
The student will: 1. test hypotheses made about two population means: independent and large samples. 2. evaluate whether the 2 samples are dependent or independent. 3. draw inferences about 2 means using matched pairs. 4. apply hypothesis testing to two variances or standard deviations using the F test. 5. test hypotheses made about two populations means: independent and small samples.	<ul style="list-style-type: none">• teacher lecture using PowerPoint presentation• teacher working examples on the board• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005• PowerPoint Presentation provided by publisher	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work

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Unit 9: Correlation and Regression

5 Lessons (1 week)

S#10

Objectives	Methods	Resources	Assessment
<p>The student will:</p> <ol style="list-style-type: none">1. determine whether there is a statistically significant linear relationship between two variables.2. construct a scatter plot.3. calculate the correlation coefficient for the data pairs which measure the strength of linearity.4. apply hypothesis test to determine if there is a significant linear correlation between two variables (using Pearson's Table).5. identify the common errors involving correlation.6. compute the Regression Equation when linear correlation exists which will allow us to predict the value of one of two variables if the value of the other variable is known.7. identify the 4 guidelines for using the regression equation.	<ul style="list-style-type: none">• teacher lecture using PowerPoint presentation• teacher working examples on the board• student guided practice of problems in book• cooperative learning groups• individual assistance• partner work• homework	<ul style="list-style-type: none">• Essentials of Statistics, 2nd Ed., Mario F. Triola; Pearson Addison Wesley, 2005• PowerPoint Presentation provided by publisher	<ul style="list-style-type: none">• check homework• Quizzes• Tests• Oral response• Board work