Unit	Essential Skills
Name: Introduction to Statistics **Quarter: 1st** **Length (Days): 9**	1. Define statistics. 2. Distinguish between a population and a sample. 3. Distinguish between a parameter and a statistic. 4. Distinguish between statistics and inferential statistics. 5. Distinguish between qualitative and quantitative data. 6. Claasify data with respect to the four levels of measurement. 7. Design a statistical study. 8. Discuss how to collect data as part of an observational study, an experiment, using a simulation or conducting a survey. 9. Design an experiment. 10. Create a sample using different sampling techniques. 11. Identify biased samples.
Name: Descriptive Statistics **Quarter: 1st** **Length (Days): 20**	1. Constructing frequency distributions including limits, midpoints, relative frequencies, cumulative frequencies, and boundaries. 2. Construct frequency histograms, frequency polygons, relative frequency histograms and ogives. 3. Graph and interpret quantitative data sets using stem-and-leaf plots and dot plots. 4. Graph and interpret qualitative data sets using pie charts and Pareto charts. 5. Graph and interpret paired data sets using scatter plots and time series charts. 6. Find the mean, median, and mode of a population and of a sample. 7. Find the weighted mean of a data set and the mean of a frequency distribution. 8. Describe the shape of a distribution as symmetric, uniform or skewed and compare the mean and median for each. 9. Find the range of a data set. 10. Find the variance and standard deviation of a population and a sample. 11. Use the Empirical Rule and Chebychev's Theorem to interpret standard deviation. 12. Approximate the mean and standard deviation of grouped data. 13. Find the 1st, 2nd, and 3rd quartiles of a data set. 14. Find the interquartile range of a data set. 15. Represent a data set graphically using a box-and-whisker plot. 16. Interpret other fractiles as percentiles. 17. Find and interpret the standard score (Z-score).
Name: Probability **Quarter: 1/2** **Length (Days): 21**	1. Identify the sample space of a probability experiment. 2. Identify simple events. 3. Use the Fundamental Counting Principle. 4. Distinguish between classical, empirical, and subjective probability. 5. Find the probability of the complement of an event. 6. Find the probability of an event given that another event has occurred. 7. Distinguish between independent and dependent events. 8. Use the multiplication rule. 9. Use the multiplication rule to find conditional probabilities. 10. Determine if two events are mutually exclusive. 11. Use the Addition Rule. 12. Use permutations. 13. Use Combinations. 14. Use the counting principle to find probabilities.
Name: Discrete Probability Distributions **Quarter: 2** **Length (Days): 17**	**1. Distinguish between discrete and continuous random variables.** **2. Construct a discrete probability distribution and its graph.** **3. Determine if a distribution is a probability distribution.** **4. Find the mean, variance, and standard deviation of a discrete probability distribution.** **5. Find the expected value of a discrete probability distribution.** **6. Determine if a probability experiment is a binomial experiment.** **7. Use the binomial probability formula to find binomial probabilities.** **8. find binomial probabilities using technology.** **9. Graph a binomial distribution.** **10. Find the mean, variance and Standard deviation of a binomial probability distribution.** **11. Find probabilities using the geometric distribution.** **12. Find probabilities using the Poisson distribution.**
Name: Normal Probability Distributions **Quarter: 2/3** **Length (Days): 23**	1. How to interpret graphs of normal probability distributions, 2. How to find areas under the standard normal curve. 3. How to find probabilities for normally distributed variables using technology. 4. How to find a z-score given the area under the normal curve. 5. How to transform a z-score to an x-value. 6. How to find a specific devalue of a normal distribution given the probability. 7. How to find sampling distributions and verify their properties. 8. How to interpret the Central Limit Theorem. 9. How to apply the Central Limit Theorem to find the probability of a sample mean. 10. How to decide when a normal distribution can approximate a binomial distribution. 11. How to find the continuity correction. 12. How to use a normal distribution to approximate binomial probabilities.
Name: Confidence Intervals **Quarter: 3** **Length (Days): 14**	1. How to find a point estimate and Margin of Error. 2. How to construct and interpret confidence intervals for the population mean. 3. How to determine the minimum sample size required when estimating the population mean. 4. How to interpret the t-distribution and use a t-distribution table. 5. How to construct confidence intervals when n < 30, the population is normally distributed and the standard deviation is unknown. 6. How to find a point estimate for a population proportion. 7. How to construct a confidence interval for a population proportion. 8. How to determine the minimum sample size required when estimating a population proportion. 9. How to interpret the chi-square distribution and use a chi-square distribution table. 10. How to use the chi-square distribution to construct a confidence interval for the variance and standard deviation.

Name: Hypothesis Testing with Two Samples **Quarter: 4** **Length (Days): 20**	1. How to decide whether two samples are independent or dependent. 2. An introduction to two-sample hypothesis testing for the difference between two population parameters. 3. How to perform a two-sample z-test for the difference between two means using large independent samples. 4. How to perform a t-test for the difference between two population means using small, independent samples. 5. How to perform a t-test to test the mean of the differences for a population of paired data. 6. How to perform a z-test for the difference between two population proportions.
Name: Correlation and Regression **Quarter: 4** **Length (Days): 19**	1. An introduction to linear correlation, independent and dependent variables, and the types of correlation. 2. How to find a correlation coefficient. 3. How to test a population correlation coefficient using a table. 4. How to perform a hypothesis test for a population correlation coefficient. 5. How to distinguish between correlation and causation. 6. How to find the equation of a regression line. 7. How to predict y-values using a regression equation. 8. How to interpret the three types of variation about a regression line. 9. How to find and interpret the coefficient of determination. 10. How to find and interpret the standard error of estimate for a regression line. 11. How to construct and interpret a prediction interval for y. 12. How to use technology to find a multiple regression equation, the standard error of estimate, and the coefficient of determination. 13. How to use a multiple regression equation to predict y-values.