



Course Number Course Name	Math 1350 Introduction to Statistics
Credit Value (Breakdown of theory and lab credits)	3 Theory
Catalog Course Description	This course discusses the fundamentals of descriptive and inferential statistics. Students will gain introductions to topics such as descriptive statistics, probability and basic probability models used in statistics, sampling and statistical inference, and techniques for the visual presentation of numerical data. These concepts will be illustrated by examples from a variety of fields. Prerequisite: MATH 1215. (3, 3T+0S)
Student Learning Outcomes/Objectives /Competencies of the Course	<p>Student Learning Outcomes</p> <ol style="list-style-type: none"> 1. Explain the general concepts of statistics. <ol style="list-style-type: none"> a. Explain and evaluate statistics used in the real world (from a news article, research project, etc.). b. Use statistical vocabulary appropriately. c. Distinguish between descriptive and inferential statistics. d. Distinguish between qualitative and quantitative data. e. Distinguish between populations and samples, and parameters and statistics. f. Give examples of independent and dependent variables. 2. Presentation and description of data. <ol style="list-style-type: none"> a. Present data graphically using histograms, frequency curves and other statistical graphs. b. Interpret graphs of data, including histograms and shapes of distributions. 3. Summarize data using measures of central tendency and variation. <ol style="list-style-type: none"> a. Calculate and interpret the mean, median, and mode to describe data. b. Calculate and interpret range, variance, and standard deviation to describe data. 4. Present the concepts of probability. <ol style="list-style-type: none"> a. Interpret basic probabilities. b. Calculate probabilities using compound probability rules and the binomial distribution. c. Calculate probabilities using the standard normal distribution and relate them to areas under the curve. d. Determine if the binomial distribution can be approximated with the normal distribution. e. Describe the relationship between the sampling distribution and the population distribution. f. Use the central limit theorem to approximate the probability distribution and calculate probabilities.

	<ol style="list-style-type: none"> 5. Compute point and interval estimates. <ol style="list-style-type: none"> a. Determine the confidence interval for a parameter. b. Interpret the confidence level and margin of error. c. Determine whether a statistical technique is appropriate under stated conditions. 6. Perform hypothesis tests. <ol style="list-style-type: none"> a. Determine whether a statistical test is appropriate under stated conditions. b. Identify null and alternative hypothesis. c. Perform and interpret statistical tests (e.g. z-test, t-test, one-tailed and two-tailed, one-sample, two-sample) and determine whether data is statistically significant. d. State the conclusion of a hypothesis test. e. Interpret a p-value as compared to a significance level. f. Explain why a test can lead us to reject a null hypothesis, not accept one. g. Distinguish between Type I and Type II errors. 7. Analyze data using regression and correlation. <ol style="list-style-type: none"> a. Explain the difference between correlation and causation. b. Construct and interpret scatter plots. c. Calculate and interpret the linear correlation coefficient. d. Determine and use the equation of a least-squares regression line between two variables to make predictions. e. Interpret the meaning of the coefficient of determination. 8. Optional topics. <ol style="list-style-type: none"> a. Inter-quartile range, box-plots, stem-and-leaf plots. b. Combinations and permutations. c. The Poisson distribution. d. Statistical power. e. Chi-square. f. Analysis of variance.
<p>College-Wide Student Learning Outcomes</p>	<p>Math 1350 learning objectives align with the following NNMC College Wide Goal:</p> <p><i>Critical thought: Students are required to analyze and synthesize information and draw reasoned conclusions.</i></p>