**NUSTEP Statistics MAT 530**

**This NUSTEP course is an opportunity for students to earn concurrent enrollment (High School and College) credit. Please visit the website** [**www.niagara.edu/nustep**](http://www.niagara.edu/nustep) **for more information on this program**

**Resource(s) Used:**

**Primary: Unlocking The Power of Data by Lock, Lock, Lock, Lock and Lock**

This course includes a study of the basic terminology and methods of elementary statistics including organization of data, measures of central tendency and dispersion, sampling theory, estimation and testing of hypotheses. This course also includes an introduction to correlation and linear regression. Three credit hours are available from Niagara University. To qualify for college credit, students must pass a final exam that is approved by Niagara University. A class period of instruction consists of 47 minutes each day, five days a week for a length of 40 weeks.

**Final Assessment:** Students will be required to take a final exam approved by Niagara University.

**Course Syllabus**

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| **Lesson** | **Topic(s)**  |
| **0.1** | Sample Spaces  |
| **0.2** | Simple Probability |
| **0.3** | Probability involving “and” and “or”  |
| **0.4** | Permutations and Combinations |
| **0.5** | Probability involving “exactly, “at least” and “at most”  |
| **1.1** | The structure of Data |
| **1.2**  | Sampling from a Population |
| **1.3** | Experiments and Observational Studies |
| **2.1** | Categorical Variables |
| **2.2** | One Quantitative Variable: Shape and Center |
| **2.3** | One Quantitative Variable: Measures of Spread |
| **2.4** | Outliers, Boxplots and Quantitative Categorical Relationships |
| **2.5** | Two Quantitative Variables: Scatterplot and Correlation |
| **2.6** | Two Quantitative Variables: Linear Regression |
| **3.1** | Sampling Distributions |
| **3.2** | Understanding and Interpreting Confidence |
| **3.3** | Constructing Bootstrap Confidence Intervals |
| **3.4** | Bootstrap Confidence Intervals using Percentiles |
| **4.1** | Introducing Hypothesis Tests  |
| **4.2** | Measuring Evidence with P-values |
| **4.3** | Determining Statistical Significance |
| **4.4** | Creating Randomization Distributions |
| **4.5** | Confidence Intervals and Hypothesis Tests |
| **5.1** | Normal Distributions |
| **5.2** | Confidence Intervals and P-values Using Normal Distributions |
| **6.1** | Distribution of a Sample Proportion |
| **6.2** | Confidence Interval for a Single Proportion |
| **6.3** | Test for a Single Proportion |
| **6.4** | Distribution of a Sample Mean |
| **6.5** | Confidence Interval for a Single Mean |
| **6.6** | Test for a Single Mean |
| **6.11** | Confidence Interval for a Difference in Means |
| **6.12** | Test for a Difference in Means |
| **6.13** | Paired Difference in Means  |