STATISTICS

Unit I - Descriptive Statistics

- Descriptive and Inferential Statistics
- Sampling Methods
- Types of Variables
- Independent and Dependent Variables
- Variable Measurement Scales
- Frequency Distributions and Cumulative Frequency Distributions
- Bar Graphs and Pie Charts
- Histograms and Stem & Leaf Plots
- Arithmetic Mean for Samples and Populations
- Central Tendency: Mean, Median, and Mode
- Variance and Standard Deviation of a Population
- Variance and Standard Deviation of a Sample
- Percentiles and Quartiles
- The Five Number Summary, Interquartile Range(IQR), and Boxplots
- The Effects of Outliers
- Skewness
- The Normal Curve and Empirical Rule
- Z-Scores (part one)
- Z-Scores (part two)
- Extra Z-Score Problems

Unit II – Probability

- The Basics of Probability
- Addition Rule (Probability of)
- Multiplication Rule (Probability and)
- Permutations
- Combinations
- Discrete and Continuous Random Variables
- Discrete Probability Distributions
- Probability Histograms
- Mean and Expected Value of Discrete Random Variables
- Variance and Standard Deviation of Discrete Random Variables
- The Law of Large Numbers
- Binomial Distribution
- Mean and Standard Deviation of Binomial Random Variables
- Poisson Distribution/Process
- Mean and Standard Deviation of Poisson Random Variables

Unit III - Correlation & Regression

- Coordinate (Cartesian) Planes
- Quadrants
- Scatter Plots
- Pearson’s r Correlation

- Hypothesis Testing with Pearson's r
- The Spearman Correlation
- Linear Regression
- Correlation vs. Causation

Unit IV - Inferential Statistics

- Parameters, Statistics, and Sampling Error
- Distribution of the Sample Mean
- The Central Limit Theorem
- Sample Proportions
- Confidence Intervals about the Mean, Population Standard Deviation Known
- Calculating Required Sample Size to Estimate Population Mean
- Student’s t-Distribution
- Confidence Intervals about the Mean, Population Standard Deviation Unknown
- Confidence Intervals for Population Proportions
- Calculating Required Sample Size to Estimate Population Proportions
- Null and Alternative Hypotheses
- Type I and Type II Errors
- One-Tailed and Two-Tailed Tests
- Effect Size
- Power
- Statistical vs. Practical Significance
- Independent and Dependent Samples
- One Sample z-Test
- One Sample z-Test for Proportions
- One Sample t-Test
- Independent Samples t-Test
- Confidence Intervals for Independent Samples t-Test
- Effect Size for Independent Samples t-Test
- t-test, Two Dependent Samples
- Confidence Intervals for Dependent Samples t-Test
- Effect Size for Dependent Samples t-Test
- z-Test for Proportions, Two Samples
- Confidence Intervals for the Difference of Two Proportions
- Introduction to ANOVA
- One-Way ANOVA
- Effect Size for One-Way ANOVA
- Post Hoc Tests for One-Way ANOVA
- Repeated-Measures ANOVA
- Factorial ANOVA, Two Independent Factors
- Factorial ANOVA, Two Dependent Factors
- Factorial ANOVA, Two Mixed Factors
- Chi-Square Goodness-of-Fit Test
- Chi-Square Test for Independence
- Mann-Whitney U
- Wilcoxon Signed-Ranks Test
- Kruskal-Wallis Test
- Friedman Test