Statistics Study Guide

You need to understand the terms AND be able to recognize them when given examples. You should also be familiar with the use of a particular statistic within the context of the various experimental designs.

- The difference between descriptive versus inferential statistics
- Levels of measurement, including nominal, ordinal, equal interval, and ratio scales
- Frequency Graphs, including histograms and frequency polygons:
- Unimodal and bimodal frequency distributions
- Symmetrical and skewed frequency distributions
- Normal and kurtotic frequency distributions
- Central tendency and Variability
- Mean, median, and mode
- Variance and standard deviation
- The shape of the normal distribution
- Z-scores (standard scores)
- The mean and standard deviation of a distribution of z-scores
- The normal curve (normal distribution)
- Populations and samples
- Methods of sampling
- Population parameters and sample statistics
- Probability
- Using nonrandom samples
- The populations involved in hypothesis testing
- The research hypothesis
- The null hypothesis
- Significance and conventional levels of significance
- When to reject the null hypothesis and the implications of this decision
- When not to reject the null hypothesis and the implications of this decision
- Directional and nondirectional hypotheses
- One-tailed versus two-tailed tests
- Relationship between Type I and Type II Errors, alpha and beta
- Effect size
- Meta-analysis
- Statistical power
- Ways to increase the power of a planned study
- t tests
- Controversies and limitations: the problem of too many t tests
- Analysis of Variance
- Post hoc Comparisons
- Patterns of correlation: linear, positive, negative, curvilinear, and no correlation
- The correlation coefficient (r)
- Statistical significance of a correlation coefficient
- Assumptions for the significance test of a correlation coefficient
- Causality and correlation
- Issues in interpreting the correlation coefficient, including, proportionate reduction in error ($r^2$), restriction of range, unreliability of measurement, influence of outliers, and curvilinearity
- Regression
- Multiple regression
- Chi-square statistic
- Observed and expected frequencies