

Basic Statistics

Course Outlines

- **Basic Statistical Concepts**
 - descriptive and inferential statistics
 - populations and samples
 - parameters and statistics
 - uses of variables: independent and dependent
 - types of variables: quantitative and categorical
 - scales of measurement (nominal, ordinal, interval, and ratio)
 - statistical methods
- **Descriptive Statistics**
 - describing your data
 - measures of location
 - percentiles
 - measures of variability
- **Picturing Your Data**
 - picturing your data: histogram
 - normal distribution
 - assessing normality
 - measures of shape: skewness
 - measures of shape: kurtosis
 - normal probability plots
 - box plots
 - comparing distributions
- **Confidence Intervals for the Mean**
 - point estimators, variability, and standard error
 - distribution of sample means
 - interval estimators
 - confidence intervals
 - normality and the central limit theorem
- **Hypothesis Testing**
 - decision-making process
 - steps in hypothesis testing
 - types of errors and power
 - the p-value, effect size, and sample size
 - statistical hypothesis test
 - the t statistic, t distribution, and two-sided t-test
- **Tests and Analysis of Variance**
 - performing tests of differences between two group means
 - performing one-way ANOVA
 - performing post-hoc multiple comparisons tests
 - performing two-way ANOVA with and without interactions

➤ **Linear Regression**

- producing correlations
- fitting a simple linear regression model
- understanding the concepts of multiple regression
- using automated model selection techniques in PROC REG to choose from among several candidate models
- interpreting models
- Linear Regression Diagnostics
- examining residuals
- investigating influential observations
- assessing collinearity