Miami Dade College
STA 2023 – Statistical Methods I

Course Description: The student in this course will acquire knowledge in the following topics: collecting, grouping, and presenting data; measures of central tendency and dispersion; probability; testing hypotheses; confidence intervals, and correlation. (3 hr. lecture)

Co-requisite: MAC 1105 or higher.

Competency 1: The student will be able to analyze data by:

a. Constructing and interpreting frequency tables and graphs such as bar graphs, pie charts and stem-and-leaf plots.
b. Computing and interpreting the measures of centrality: the mean, median, mode and midrange.
c. Computing and interpreting the measures of dispersion: the range, variance and standard deviation.

Competency 2: The student will be able to apply the measures of position by:

a. Computing z-scores.
b. Applying the Empirical Rule to the Normal Distribution.
c. Applying the Chebyshev's Rule to the Non-Normal (or unknown) Distributions.

Competency 3: The student will be able to apply the counting principles by:

a. Defining the Fundamental Counting Principle.
b. Computing the possible outcomes of compound events.
c. Computing Combinations and Permutations.

Competency 4: The student will be able to apply basic probability theory by:

a. Describing a sample space and an event.
b. Calculating probabilities of simple, compound and conditional events.

Competency 5: The student will be able to analyze random variables by:

a. Distinguishing between discrete and continuous random variables.
b. Constructing a probability distribution for a discrete random variable and computing its mean and standard deviation.
c. Computing probabilities for random variables having a binomial distribution.
d. Computing probabilities for random variables having a normal distribution.
e. Applying the Central Limit Theorem.
f. Approximating the Binomial Probability using the Normal Distribution.

Competency 6: The student will be able to analyze confidence intervals by:

a. Constructing confidence intervals of a single mean with a known population standard deviation.
b. Constructing confidence intervals of a single mean with an unknown population standard deviation.
c. Constructing confidence intervals of a single proportion.
d. Constructing confidence intervals of the difference between two means.

Competency 7: The student will be able to apply hypothesis test procedures by:

a. Identifying Type I and Type II errors.
b. Identifying and interpreting p-values.
c. Testing a single mean for large or small samples
d. Testing the difference between two means.
e. Testing a single proportion.

Competency 8: The student will be able to analyze bivariate data by:

a. Constructing and interpreting a scatter-plot.
b. Computing and interpreting the linear correlation coefficient.
c. Determining the simple linear regression equation and using it to make predictions.