

**Course Description****STA2023 | Statistical Methods | 3.00 credits**

In this course, students will utilize descriptive and inferential statistical methods in contextual situations, using technology as appropriate. The course is designed to increase problem-solving abilities and data interpretation through practical applications of statistical concepts. This course is appropriate for students in a wide range of disciplines and programs. Computational course.

**Course Competencies:**

**Competency 1:** The student will demonstrate knowledge of terminology by:

1. Defining statistical terms.

**Learning Outcomes:**

1. Communication

**Competency 2:** The student will be able to describe, explore, and compare data by:

1. Constructing and interpreting frequency tables and graphs such as bar graphs, pie charts, and stem and leaf plots.
2. Computing and interpreting the measures of centrality: The mean, median, mode, and midrange.
3. Computing and interpreting the measures of dispersion: The range, variance, and standard deviation.

**Learning Outcomes**

1. Communication
2. Critical thinking
3. Information Literacy
4. Numbers / Data
5. Social Responsibility

**Competency 3:** The student will be able to apply the measures of positions by:

1. Computing z-scores.
2. Applying the Empirical Rule to the Normal Distribution.
3. Applying the Chebyshev's Rule to the Non-Normal (or unknown) Distributions.

**Learning Outcomes**

1. Communication
2. Critical thinking
3. Information Literacy
4. Numbers / Data
5. Social Responsibility

**Competency 4:** The student will be able to apply the counting principles by:

1. Defining the Fundamental Counting Principle.
2. Computing the possible outcomes of compound events.
3. Computing Combinations and Permutations.

**Learning Outcomes**

1. Communication
2. Critical thinking
3. Information Literacy

4. Numbers / Data
5. Social Responsibility

**Competency 5:** The student will demonstrate knowledge of probability by:

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

**Learning Outcomes:**

1. Communication
2. Critical thinking
3. Information Literacy
4. Numbers / Data
5. Social Responsibility

**Competency 6:** The student will demonstrate knowledge of random variables by:

1. Distinguishing between discrete and continuous random variables.
2. Constructing a probability distribution for a discrete random variable and be able to compute its mean and standard deviation.
3. Computing probabilities for random variables having a binomial distribution.
4. Computing probabilities for random variables having a normal distribution.
5. Applying the Central Limit Theorem.
6. Approximating the Binomial Probability using the Normal Distribution.

**Learning Outcomes:**

1. Communication
2. Critical thinking
3. Information Literacy
4. Numbers / Data
5. Social Responsibility

**Competency 7:** The student will demonstrate knowledge of confidence intervals by:

1. Constructing confidence intervals for the mean using the Z and t tables.
2. Constructing confidence intervals for a proportion.
3. Constructing confidence intervals for the difference of two means.

**Learning Outcomes:**

1. Communication
2. Critical thinking
3. Information Literacy
4. Numbers / Data
5. Social Responsibility

**Competency 8:** The student will demonstrate knowledge of hypotheses testing by:

1. Identifying Type I and Type II errors.
2. Identifying and interpreting p-values.
3. Testing a single mean for large and small samples.
4. Testing the difference between two means.
5. Testing a single proportion.

**Learning Outcomes**

1. Communication
2. Critical thinking

3. Information Literacy
4. Numbers / Data
5. Social Responsibility

**Competency 9:** The student will demonstrate knowledge of bivariate data by:

1. Constructing and interpreting a scatter plot.
2. Computing and interpreting the linear correlation coefficient.

**Learning Outcomes**

1. Communication
2. Critical thinking
3. Information Literacy
4. Numbers / Data
5. Social Responsibility