BARTON COMMUNITY COLLEGE

**COURSE SYLLABUS**

1. **GENERAL COURSE INFORMATION**

Course Number: STAT 1829

Course Title: Elements of Statistics

Credit Hours: 3

Prerequisite: MATH 1828 College Algebra with a grade of C or better OR MATH 1826

 College Algebra with Review with a grade of C or better OR appropriate

 placement score

Division/Discipline: Academics Division/Mathematics

Course Description: This course will cover descriptive statistics, probability, random variables, random sampling, sampling theory, confidence intervals, hypothesis testing, and linear regression.

1. **INSTRUCTOR INFORMATION**
2. **COLLEGE POLICIES**

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The College assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

Plagiarism on any academic endeavors at Barton Community College will not be tolerated. The student is responsible for learning the rules of, and avoiding instances of, intentional or unintentional plagiarism. Information about academic integrity is located in the Student Handbook.

The College reserves the right to suspend a student for conduct that is determined to be detrimental to the College educational endeavors as outlined in the College Catalog, Student Handbook, and College Policy & Procedure Manual. (Most up-to-date documents are available on the College webpage.)

Any student seeking an accommodation under the provisions of the Americans with Disability Act (ADA) is to notify Student Support Services via email at disabilityservices@bartonccc.edu.

1. **COURSE AS VIEWED IN THE TOTAL CURRICULUM**

Elements of Statistics is the beginning statistics course for students majoring in many fields including sociology, business and economics, agriculture, engineering, ecology, psychology, education, and medicine. The emphasis is on understanding how to use statistics to address real problems. This course will provide a base from which students can proceed to more advanced work, including specialized applications. Elements of Statistics is an approved fundamental general education course at Barton Community College that can be used to fulfill degree requirements.

This course transfers credit to all Kansas Regent Universities, and may be used to help fulfill a general education requirement at many. General education requirements and the transferability of all college courses will vary among institutions, and perhaps even among departments, colleges, or programs within an institution. Institutional requirements may also change without prior notification. Students are responsible to obtain relevant information from intended transfer institutions to insure that the courses the student enrolls in are the most appropriate set of courses for the transfer program.

1. **ASSESSMENT OF STUDENT LEARNING**

Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

KRSN MAT1020-Elementary Statistics

The learning outcomes and competencies detailed in this syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups for this course, as sanctioned and approved by the Kansas Board of Regents.

Course Outcomes, Competencies, and Supplemental Competencies:

A student will be able to use appropriate technology as one tool to:

1. Organize and describe data
2. Define and distinguish between categorical (qualitative) and numerical (quantitative) data.
3. Distinguish between data from an observational study and data from a designed experiment.
4. Distinguish differences in data analysis and interpretation between observational data and data from designed experiments.
5. Organize data in frequency tables and contingency tables.
6. Construct appropriate graphical displays of qualitative and quantitative data for a given set of data.
7. Describe the general shape of data, skewed left, skewed right, normal or symmetric.
8. Calculate the measures of central tendency including mean and median.
9. Calculate the measures of dispersion including range, standard deviation, variance, and interquartile range; explain the meaning of dispersion as it relates to a problem.
10. Use a statistical package on a graphics calculator or a computer to enter data and analyze results.
11. Measure the position of a data point by computing a percentile
12. Find the theoretical probability of an event
13. Use probability notation including the “or” condition and the “and” condition.
14. Determine whether or not two events are mutually exclusive.
15. Determine whether or not two events are independent.
16. Calculate the probability of compound events.
17. Calculate conditional probabilities; explain the meaning of conditional probabilities.

C. Determine the probabilities of a random variable

1. Distinguish between discrete and continuous random variables.
2. Find and interpret the mean and the standard deviation of a probability distribution.
3. Recognize Bernoulli populations.
4. Use the normal distribution to solve percent problems for normally distributed populations.
5. Use the normal distribution to solve probability problems for normally distributed random variables.

D. Generate distributions for sample means

1. Calculate the mean for a distribution of sample means.
2. Calculate the standard deviation for a distribution of sample means.
3. Assess normality of a set of data.
4. Demonstrate the use of the Central Limit Theorem and explain its importance.

E. Estimate the Mean and Proportion with both large and small samples

1. Construct confidence intervals for a population mean and a difference of two population means and interpret them in context.
2. Construct confidence intervals for a population proportion and a difference of two population proportions and interpret them in context.

F. Use Hypothesis Tests with both large and small samples

1. Perform hypothesis tests for a population mean and a difference of two population means and interpret results.
2. Perform a hypothesis test for a population proportion and a difference of two population proportions and interpret results.
3. Explain Type I error, Type II error, p-value, significance level and power of test in context.
4. Perform Chi-squared tests.

G. Make predictions with linear data

1. Create a scatter plot and calculate a correlation coefficient for bivariate data.
2. Construct a linear regression equation, interpret the results, and test significance of slope.
3. Use a linear regression equation to make predictions about data.
4. Calculate the coefficient of determination for a linear regression equation and interpret results.
5. **INSTRUCTOR'S EXPECTATIONS OF STUDENTS IN CLASS**
6. **TEXTBOOKS AND OTHER REQUIRED MATERIALS**
7. **REFERENCES**
8. **METHODS OF INSTRUCTION AND EVALUATION**

## **ATTENDANCE REQUIREMENTS**

###### **COURSE OUTLINE**