BAKER COLLEGE
STUDENT LEARNING OUTCOMES

MTH2710 Probability and Statistics for Educators
3 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Describe the characteristics of good data collection.
   a. Define random sampling.
   b. Identify methods of sampling.
   c. Differentiate between categorical and quantitative data.
   d. Identify the level of measurement for quantitative data.
2. Summarize data using graphs
   a. Select appropriate statistical graphs for categorical and quantitative data.
   b. Interpret frequency distributions, histograms, stem-and-leaf plots, scatterplots, and boxplots.
   c. Create appropriate graphs for real-world data.
3. Summarize quantitative data using appropriate numerical measures.
   a. Calculate the measures of central tendency and variation, and measures of relative standing.
   b. Interpret the measures of central tendency and variation, and measures of relative standing for real world data.
   c. Apply the Empirical Rule or Chebyshev's Theorem.
4. Apply the fundamental concepts of probability to statistical decisionmaking.
   a. Distinguish between experimental, theoretical, and subjective probability.
   b. Calculate simple, compound, and binomial probability.
   c. Calculate the mean and standard deviation from the probability distribution for a random variable.
   d. Interpret the mean and standard deviation of the probability distribution of a random variable.
   e. Find the probability of a normally distributed, continuous random variable.
5. Apply the Central Limit Theorem to draw inferences about the population mean or proportion.
   a. Explain the relationship between sampling distributions and estimators.
   b. Distinguish between point estimates and confidence intervalestimates.
   c. Estimate a population proportion or population mean using confidence intervals.
   d. Estimate the sample size needed in order to achieve a prescribed margin of error or level of significance.
   e. Perform a test a hypothesis about a population proportion or population mean using a z-test or a t- test.

6. Apply the Central Limit Theorem to draw inferences about the difference in means or proportions for between two populations.
   a. Differentiate between independent and paired samples.
   b. Estimate the difference in means or proportions for two populations using a confidence interval.
   c. Perform a test a hypothesis about the difference between two population proportions or means using a z-test or a t-test.
7. Predict values of the dependent variable in a bivariate data set.
   a. Distinguish between the dependent and independent variables.
   b. Calculate the linear correlation coefficient.
   c. Interpret the linear correlation coefficient.
   d. Calculate the line of best fit using the least squares method.
   e. Determine when it is appropriate to use the line of best fit to estimate a value of the dependent variable.
   f. Recognize the potential impact of confounding variables.
8. Evaluate multinomial experiments for goodness of fit using the chi-squaredistribution.

Big Ideas and Essential Questions

Big Ideas:

- Data Collection
- Measures of Central Tendency and Variation
- Statistical Inference

Essential Questions:

1. How does statistical analysis help me understand a data set?
2. How can statistics be used to form predictions about a population?

These SLOs are not approved for experiential credit.

Effective: Fall 2017