MAT 152 Statistical Methods I

COURSE DESCRIPTION:

Prerequisite(s): Take One Set:

Set 1: DMA-010, DMA-020, DMA-030, and DRE-098

Set 2: DMA-010, DMA-020, DMA-030, and ENG-002

Set 3: DMA-010, DMA-020, DMA-030, and BSP-4002

Set 4: DMA-025, and DRE-098

Set 5: DMA-025, and ENG-002

Set 6: DMA-025, and BSP-4002

Set 7: MAT-003 and DRE-098

Set 8: MAT-003 and ENG-002

Set 9: MAT-003 and BSP-4002

Set 10: BSP-4003 and DRE-098

Set 11: BSP-4003 and ENG-002

Set 12: BSP-4003 and BSP-4002

Corequisite(s): MAT 052

This course provides a project-based approach to introductory statistics with an emphasis on using real-world data and statistical literacy. Topics include descriptive statistics, correlation and regression, basic probability, discrete and continuous probability distributions, confidence intervals and hypothesis testing. Upon completion, students should be able to use appropriate technology to describe important characteristics of a data set, draw inferences about a population from sample data, and interpret and communicate results. *This is a Universal General Education Transfer Component (UGETC) course*

Course Hours Per Week: Class, 3. Lab, 2. Semester Hours Credit, 4.

LEARNING OUTCOMES:

Upon completing requirements for this course, the student will be able to:

1. Organize, display, calculate, and interpret descriptive statistics
2. Apply basic rules of probability
3. Identify and apply appropriate probability distributions
4. Perform regression analysis
5. Analyze sample data to draw inferences about a population parameter
6. Communicate results through a variety of media

OUTLINE OF INSTRUCTION:

I.   Data Collection
   - A. Introduction to the Practice of Statistics
   - B. Simple Random Sampling
   - C. Other Effective Sampling Methods
   - D. Bias in Sampling

II. Organizing and Summarizing Data
   - A. Organizing Qualitative Data
   - B. Organizing Quantitative Data: The Popular Displays
   - C. Graphical Misrepresentations of Data

III. Numerically Summarizing Data
>   A. Measures of Central Tendency
>   B. Measures of Dispersion
>   C. Measures of Position and Outliers
>   D. The Five-Number Summary and Boxplots

IV. Probability
>   A. Probability Rules
>   B. The Addition Rule and Complements

V. Discrete Probability Distributions
>   A. Discrete Random Variables
>   B. The Binomial Probability Distribution

VI. The Normal Probability Distribution
>   A. Properties of the Normal Distribution
>   B. Applications of the Normal Distribution

VII. Sampling Distributions
>   A. Distribution of the Sample Mean
>   B. Distribution of the Sample Proportion

VIII. Estimating the Value of a Parameter Using Confidence Intervals
>   A. Estimating a Population Proportion
>   B. Estimating a Population Mean

IX. Hypothesis Tests Regarding a Parameter
>   A. The Language of Hypothesis Testing
>   B. Hypothesis Tests for a Population Proportion
>   C. Hypothesis Tests for a Population Mean

X. Inferences on Two Samples
>   A. Inferences about Two Population Proportions
>   B. Inferences about Two Means: Dependent Samples
>   C. Inferences about Two Means: Independent Samples

XI. Describing the Relation Between Two Variables
>   A. Scatter Diagrams and Correlation
>   B. Least Squares Regression

XII. Oral and Written Presentation of statistical results/analysis throughout the course

REQUIRED TEXTBOOK AND MATERIAL:
The textbook and other instructional material will be determined by the chair/instructor.