MATH 1401
Elementary Statistics (3 hrs.)
Mathematics Department
Valdosta State University

REQUIRED TEXT: *Fundamentals of Statistics: Informed Decisions Using Data* by Michael Sullivan III: 6th Edition, 2022, Pearson; access code to MyLab is required. (Available through Day-1 in Blazeview.)

CALCULATOR: TI-83, TI-83+, TI-84, or TI-84+ (REQUIRED)

COURSE DESCRIPTION: An introductory course in statistics. Topics include descriptive statistics; basic notions of probability, random variables, probability distributions, simple random sampling, and sampling distributions; confidence intervals and hypothesis tests; and regression. The application of statistical methodology and the use of computer software are emphasized.

LEARNING OUTCOMES: Upon successful completion of this course, students will be able to:

1. Students will produce and interpret descriptive statistics, graphically, numerically, and in tabular format.
2. Students will calculate and interpret probability using union, intersection, and compliment rules.
3. Students will compute and interpret expected value, variance, and standard deviation for discrete random variables.
4. Students will use technology to calculate probabilities for the normal and binomial distributions.
5. Students will produce and interpret confidence interval, and hypothesis testing for one and two populations' means using technology.
6. Students will produce and interpret confidence interval, and hypothesis testing for one population's proportion using technology.
7. Students will use correlation analysis to determine the strength of a linear relationship between bivariate data and apply linear regression to describe this relationship.

VSU GENERAL EDUCATION OUTCOME:
(Area D)
Students will demonstrate understanding of the physical universe and the nature of science, and they will use scientific methods and/or mathematical reasoning and concepts to solve problems.

COURSE OUTLINE: (Based on 45 sessions, 3 days per week)

Chapter/Section	Topics	Suggested Days
1.1 – 1.6	**Data Collection:** **Statistical Definitions, Sampling Techniques**	1.5
2.1 – 2.2	**Organizing and Summarizing Data:** **Organizing Qualitative and Quantitative Data,** **Graphical and Tabular Methods, Types of Distributions**	3

3.1 – 3.5	**Numerically Summarizing Data:** **Mean, Median, Mode, Variance, Standard Deviation,** **Z-Scores, Chebyshev's Theorem, Empirical Rule,** **Percentiles, Quartiles, Boxplots, Outliers**	**4.5**
4.1 – 4.3	**Linear Correlation:** **Scatter Diagrams, Linear Correlation Coefficient,** **Least-Squares Regression, Coefficient of Determination**	**3**
5.1 – 5.5	**Probability Rules:** **Addition Rule, Complements, Multiplication Rule,** **Independence, Conditional Probability,** **Permutations, Combinations**	**7.5**
6.1 – 6.2	**Discrete Probability Distributions:** **Distribution, Mean, Variance,** **Standard Deviation of Discrete Random Variable,** **Binomial Distribution**	**3**
7.1 – 7.2	**Normal Distribution:** **Area under the curve using table** **or technology and its relation to probability,** **Standard Normal Curve**	**3**
8.1 – 8.2	**Sampling Distributions:** **Distribution of Sample Mean,** **Distribution of Sample Proportion**	**1.5**
9.1 – 9.2	**Estimating Value of a Parameter:** **Point Estimate, Confidence Intervals for Population Mean,** **Confidence Intervals for Population Proportion, t-distributions**	**3**
10.1 – 10.3	**Hypothesis Testing:** **Hypothesis Test for a Population Mean,** **Hypothesis Test for a Population Proportion**	**3**
11.1 – 11.3	**Inferences on Two Samples:** **Inference about Two Means,** **Inference about Two Proportions**	**3**
Other	**Exams/Reviews**	**9**
Grand Total		**45**