

**Saint Leo University**

**MAT 201  
Introduction to Statistics**

**Course Description:**

Development of the fundamental statistical methods, including graphs, measures of central tendency, and variation. Inferential statistics includes a basic review of the concepts of probability, binomial probability, normal distribution, CLT, confidence intervals, hypothesis testing, regression analysis, and correlation. Use of statistical software packages. Applications to business, social science, education, and environmental science.

**Prerequisite:**

C- or better in MAT 141, or MAT 151 or higher, or mathematics placement.

**Textbooks:**

The custom book package information which appears on our Saint Leo bookstore order site is as follows:

Bondari & White, Analyzing Statistics Through Critical Thinking and Values. (2015) Amazon. ISBN# 9780991634613

AND

Triola, MySTATLab for Elementary Statistics (13th edition). New York: Pearson Custom. ISBN# 9780134691855 (Note: This custom package contains both the eBook and MyMathLab access. As this is a Direct Digital Access package integrated within the course, no access code is required)

The custom package above was created from the following national text and resources:

Triola, Elementary Statistics. (13th Ed.) Pearson Education, Incorporated. ISBN# 9780134462455

MyStatLab for Triola, Elementary Statistics. (13th Ed.)

**Recommended Materials:**

A TI-83/84 calculator, EXCEL, or statistical software is highly recommended for the course. You may choose to use a different statistical calculator or software at your own risk.

**Learning Outcomes:**

1. Students will be able to compute measures of center and variation and use z-score to compare relative position of data as demonstrated on problem sets, quizzes, exams, and projects.
2. Students will be able to compute normal probability distributions and solve normal distribution and Central Limit Theorem application problems as demonstrated on problem sets, quizzes, exams, and projects.
3. Students will be able to construct confidence intervals for proportion or mean of populations, predict the minimum sample size for estimation problems, and perform appropriate hypothesis procedure to test the claim about proportion or mean of a population as demonstrated on problem sets, quizzes, exams, and projects.
4. Students will be able to compute the coefficient of linear correlation and find the equation of line of regression as demonstrated on problem sets, quizzes, exams, and projects.
5. Students will be able to apply technology to compute measures of center, equation of line of regression, and analyze data as demonstrated on problem sets, quizzes, exams, and projects.

- By solving applied statistics problems such as quality control applications through assignments, quizzes, projects, and exams, students will demonstrate their respect for the beauty and the significance of mathematics and statistics.

**Core Value:**

*Respect:* Animated in the spirit of Jesus Christ, we value all individuals' unique talents, respect their dignity, and strive to foster their commitment to excellence in our work. Our community's strength depends on the unity and diversity of our people, on the free exchange of ideas, and on learning, living, and working harmoniously.

**Evaluation:**

**Grading Scale:**

Assignment	Weight
Discussions (8)	12%
Problem Sets (8)	12%
Practice Exams (4)	8%
Exams (4)	48%
Final Exam	20%

Grade	Score (%)
A	94-100
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D+	67-69
D	60-66
F	0-59

**Discussions**

Each module includes a discussion question to spark conversation around a central theme. For each discussion, students are required to post an initial response to the question **no later than Thursday 11:59 PM EST/EDT** of each module. In addition, students must post a meaningful and substantial response to a minimum of two classmates **no later than Sunday 11:59 PM EST/EDT** in each module. See the Discussion Guidelines in the eCollege Classroom for further details.

**Problem Sets**

The Problem Sets assigned utilize MyStatLab. Students will be able to opt for additional help by selecting any of the support links. Students may work each problem as many times as they would like during the week. Problem Sets are due **no later than Sunday 11:59 PM EST/EDT** in each module.

**Practice Exams**

Practice Exams are provided through MyStatLab in **Modules 2, 4, 5, 7**. Students have four (4) attempts to complete each Practice Exam during the module; however, only the highest score is recorded. Practice Exams are due **no later than Sunday 11:59 PM EST/EDT** of the assigned module.

**Exams and Final Exam**

Exams are given through MyStatLab in **Modules 2, 4, 5, and 7**, with a Final Exam in Module 8. Students may only take each Exam once. Exams are due **no later than Sunday 11:59 PM EST/EDT** of the assigned module.

**Course Schedule:**

**Module 1 Introduction to Statistics**

**Objectives**

When you complete this module, you should be able to:

- Define statistics and refer to the main applications of it.
- Identify value as parameter or statistic.
- Define population and parameter.
- Identify data as discrete or continuous.
- Create frequency distributions
- Create graphs including histograms, pie charts, stem and leaf plots, bar graphs, etc.
- Recognize when a graph is accurate or deceptive

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Post an introduction to the class	Thursday 11:59 PM EST/EDT
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 1 Problem Set	Sunday 11:59 PM EST/EDT

**Module 2 Measures of Center and Variation**

**Objectives**

When you complete this module, you should be able to:

- Compute measures of center: mean, median, midrange, and mode.
- Compute measures of variation: range, variance, and standard deviation.
- Know how to use the Range Rule of Thumb and the Empirical Rule.
- Find the z-score and determine if the score is unusual.
- Use z-score to compare relative position.

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 2 Problem Set	Sunday 11:59 PM EST/EDT
Complete the Module 2 Practice Exam	Sunday 11:59 PM EST/EDT
Complete the Module 2 Exam	Sunday 11:59 PM EST/EDT

**Module 3**                      **Random Variables and Binomial Distributions**

**Objectives**

When you complete this module, you should be able to:

- Find the probability of an event using the relative frequency approach or classical approach.
- Classify random variables as discrete or continuous.
- Determine whether probability distribution is described, and find the mean of the distribution.
- Determine if process results in binomial probability distribution, and then find the probability of exactly  $x$  successes, or at least /at most  $x$  successes.

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 3 Problem Set	Sunday 11:59 PM EST/EDT

**Module 4**                      **Normal Distribution**

**Objectives**

When you complete this module, you should be able to:

- Find probabilities for standard normal distributions.
- Find probabilities for nonstandard normal distributions.
- Solve application problems for normal probability distributions.
- Discuss the meaning of the sampling distribution of the mean.
- Discuss the Central Limit Theorem and determine the probabilities for the sampling distribution of the sample means.

**Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 4 Problem Set	Sunday 11:59 PM EST/EDT
Complete the Module 4 Practice Exam	Sunday 11:59 PM EST/EDT
Complete the Module 4 Exam	Sunday 11:59 PM EST/EDT

**Module 5**                      **Confidence Intervals**

**Objectives**

When you complete this module, you should be able to:

- Interpret confidence interval limits.

- Find the margin of error and construct the confidence interval for proportion of a population, mean of a population ( $\sigma$  known), and mean of a population ( $\sigma$  unknown).
- Find the minimum sample size for estimation proportion or mean of a population.
- Find the critical value for a given confidence level.
- Determine whether z or t should be used as critical value for a confidence interval.

### Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 5 Problem Set	Sunday 11:59 PM EST/EDT
Complete the Module 5 Practice Exam	Sunday 11:59 PM EST/EDT
Complete the Module 5 Exam	Sunday 11:59 PM EST/EDT

### Module 6

#### Hypothesis Testing – Part 1

#### Objectives

When you complete this module, you should be able to:

- Discuss the fundamentals of hypothesis testing.
- Formulate claim/conclusion informally.
- Identify null and alternative hypotheses, find critical value(s) and region(s), find the P-values, find the test statistic, and formulate the conclusion of hypothesis testing.
- Test a claim about a proportion.
- Identify type I/II error.

### Assignments

Items to be Completed:	Due No Later Than:
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 6 Problem Set	Sunday 11:59 PM EST/EDT

### Module 7

#### Hypothesis Testing – Part II

#### Objectives

When you complete this module, you should be able to:

- Choose the appropriate distribution for a hypothesis test.
- Test a claim about a mean with  $\sigma$  known.
- Test a claim about a mean with  $\sigma$  unknown.

### Assignments

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 7 Problem Set	Sunday 11:59 PM EST/EDT
Complete the Module 7 Practice Exam	Sunday 11:59 PM EST/EDT
Complete the Module 7 Exam	Sunday 11:59 PM EST/EDT

## **Module 8**

### **Linear Correlations and Regressions**

#### **Objectives**

When you complete this module, you should be able to:

- Compute the coefficient of linear correlation  $r$  and decide the strength of the linear relationship between  $x$  and  $y$ .
- Determine the equation of the line of regression.
- Use the equation of the line of regression to estimate or predict the value of  $y$  given that there is a linear correlation.

#### **Assignments**

<b>Items to be Completed:</b>	<b>Due No Later Than:</b>
Read the assigned materials	
Post an initial response to the discussion question	Thursday 11:59 PM EST/EDT
Post responses to at least two classmates	Sunday 11:59 PM EST/EDT
Complete the Module 8 Problem Set	Sunday 11:59 PM EST/EDT
Complete the Final Exam	Sunday 11:59 PM EST/EDT