



**LEE ONLINE**

**SYLLABUS**

**MATH-151: Introduction to Statistics**

Date: 08/01/2019

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**University Mission Statement:**

Lee University is a Christian institution which offers liberal arts and professional education on both the undergraduate and graduate levels through residential and distance programs. It seeks to provide education that integrates biblical truth as revealed in the Holy Scriptures with truth discovered through the study of arts and sciences and in the practice of various professions. A personal commitment to Jesus Christ as Savior is the controlling perspective from which the educational enterprise is carried out. The foundational purpose of all educational programs is to develop within the students knowledge, appreciation, understanding, ability, and skills which will prepare them for responsible Christian living in a complex world.

**Catalog Description:**

An introduction to techniques for collecting, analyzing, and interpreting data. The primary emphasis is on the analysis of data sets to facilitate informed decision-making processes. Topics include sampling methods, summaries of data, descriptive statistics, probability, distributions, correlation, and regression.

**Required Text(s) and/or Supporting Resources:****Required Text:**

Bluman, A. G. *Elementary Statistics, A Brief Version*, 8<sup>th</sup> Ed. New York: McGraw-Hill, 2018. **[Charged to your Lee account as "Book Bundle" fee. See your course "IMPORTANT! E-Textbook Information" section for instructions.]** This text provides support and instruction for TI graphing calculators, Microsoft Excel, and Minitab. The student may choose to use either a TI graphing calculator, Microsoft Excel, and/or Minitab to complete statistical analysis within this course.

**Additional Supporting Resources:**

Resources provided in Learning Management System (LMS).

**Prerequisite Skills and Knowledge:**

ACT mathematics score of 19 or SAT equivalent

**Course Goals and Learning Outcomes:****PURPOSE**

This course is intended to serve as a first course in statistics and is intended primarily for non-majors. The foundational elements of descriptive and inferential statistics will be presented in broad context with elementary examples from a wide range of disciplines.

**General Learning Objectives (Course Goals):**

*This course seeks to:*

1. Develop the basic concepts of probability as a prerequisite to success in understanding statistical inference.
2. Demonstrate the proper methods of collection, tabulation, and presentation of data and the calculation of measures which describe the data.
3. Show how to use the data and descriptive measures as a basis for making inferences or decisions relating to observed and unobserved events.
4. Encourage students to analyze experimental procedures and conclusions critically.

**Specific Behavioral Objectives** (*Learning Outcomes*):

*As a result of the activities and study in this course, the student should be able to:*

1. Demonstrate knowledge of the basic terminology of probability and statistics.
2. Constructs and interpret various statistical graphs and tables including frequency distributions, histograms, frequency polygons, ogives, stem-and-leaf plots, and box plots.
3. Calculate and use the basic measures of central tendency: mean, median, mode, and midrange.
4. Calculate and use the measures of dispersion: range, variance, and standard deviation.
5. Calculate probabilities of independent events, mutually exclusive events, and compound events.
6. Demonstrate uses of normal curve (normal probability distribution).
7. Predict the behavior of sample means using the Central Limit Theorem.
8. Construct proper confidence intervals for a variety of parameters.
9. Calculate and use linear correlation and linear regression.

**Major Topics:**

- A. The nature of probability and statistics
  1. Descriptive and inferential statistics
  2. Variables and types of data
- B. Frequency distributions and graphs
  1. Organizing data
  2. Histograms, frequency polygons, and ogives
  3. Other types of graphs
- C. Descriptions of data
  1. Measures of central tendency
  2. Measures of variation or dispersion
  3. Measures of position
- D. Counting techniques
  1. The multiplication and addition rules
  2. Permutations and combinations
  3. Tree diagrams
- E. Probability
  1. Sample spaces and probability rules
  2. Addition rules for probability
  3. Multiplication rules for probability
  4. Complementary events
- F. Probability Distributions
  1. Probability distributions
  2. Mean, variance, and expectation
  3. The binomial distribution
- G. The normal distribution
  1. Properties of the normal distribution
  2. The standard normal distribution
  3. Applications
  4. The Central Limit Theorem
  5. Normal approximation to the binomial distribution

- H. Correlation and regression
1. Scatter plots
  2. Correlation coefficient
  3. The line of best fit

### Course Assessments:

- A. **Text/Media.** All text/media is evaluated in the threaded discussions, assignments, group project, and exams.
- B. **Threaded Discussions.** The threaded discussions provide opportunities for students to demonstrate their knowledge of the course material and interact with fellow students. For each discussion, the student is required to make an initial post of their thoughts/answers to the assigned topic and then respond to at least TWO peer initial posts by deadlines provided. Just doing an initial post and/or response will not guarantee any point value, but rather discussions will be evaluated on the depth of engagement with the discussion topic and with peers. Once the discussion deadline is reached, no opportunities for obtaining points for that discussion remain. If you have further questions on how these are evaluated, please contact your instructor.
- C. **Unit Assignments.** Unit assignments are assigned and submitted in the same unit. They may include assignments that are accessed through the publisher's online homework system, which are associated with the required textbook. They may also include assignments to be submitted through the Lee online course.
- D. **Group.** Teams of students are formed to work on a project. This provides an opportunity to collaborate, to apply course content to real life, and to synthesize material learned in multiple units. One student in a group is not guaranteed to earn the same number of points as another student in the same group, but rather each student will earn points according to his/her contribution to the group project. Instructor-evaluation, self-evaluation, and peer-evaluation will all play a role in evaluating an individual student's contribution to the group project. If you have further questions on how these are evaluated, please contact your instructor. There is 1 group project throughout this course.
- E. **Exams.** Exams cover more than one unit's material. There is one Mid-Term Exam, which includes content from Units 1 through 4. There is one Final Exam, which includes content from all 8 Units. These exams are found in the publisher's online system.

### Evaluation:

A. Threaded Discussions	140
B. Unit Assignments	250
C. Group	150
D. Exams	460

### Grading Scale:

The standardized grading scale provides a uniform foundation from which to assess your performance.

Grade	Quality Points per Credit	Score
A	4.0	930 - 1000
A-	3.7	900 - 929

B+	3.3	870 - 899
B	3.0	830 – 869
B-	2.7	800 – 829
C+	2.3	770 – 799
C	2.0	730 – 769
C-	1.7	700 – 729
D+	1.3	670 – 699
D	1.0	600 – 669
F	.0	0 - 599

#### Letter Grade Equivalencies:

**A** = Clearly stands out as excellent performance. Has unusually sharp insights into material and initiates thoughtful questions. Sees many sides of an issue. Articulates well and writes logically and clearly. Integrates ideas previously learned from this and other disciplines. Anticipates next steps in progression of ideas. Example "A" work should be of such nature that it could be put on reserve for all cohort members to review and emulate. The "A" cohort member is, in fact, an example for others to follow.

**B** = Demonstrates a solid comprehension of the subject matter and always accomplishes all course requirements. Serves as an active participant and listener. Communicates orally and in writing at an acceptable level for a cohort member. Work shows intuition and creativity. Example "B" work indicates good quality of performance and is given in recognition for solid work; a "B" should be considered a good grade and awarded to those who submit assignments of quality less than the exemplary work described above.

**C** = Quality and quantity of work in and out of the course is average. Has average comprehension, communication skills, or initiative. Requirements of the assignments are addressed at least minimally.

**D** = Quality and quantity of work is below average. Has marginal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at below acceptable levels.

**F** = Quality and quantity of work is unacceptable and does not qualify the student to progress to a more advanced level of work.

#### Unit and Time Distribution:

The time to complete each unit is approximately 14-16 hours per week on average for a three hour course. Actual assignment completion times will vary. A more detailed breakdown of each assignment can be found within the course.

## POLICIES

### Attendance Policy:

At Lee University student success is directly related to the student actively attending and engaging in the course. Online courses are no different from classroom courses in this regard; however, participation must be defined in a different manner.

Online courses will have weekly mechanisms for student participation, which can be documented by submission/completion of assignments, participation in threaded discussions, and/or specific communication with the instructor as outlined within the syllabus.

### Academic Honesty Policy/Information:

Cheating is defined as the use or attempted use of unauthorized materials or receiving unauthorized assistance or communication during any academic exercise.

Examples of cheating include:

- Submitting work for academic evaluation that is not the your own.
- Receiving assistance from another person during an examination.
- Using prepared notes or materials during an examination.
- Permitting another student to copy your work.
- Plagiarism.
- Falsification.
- Other misrepresentations of academic achievement submitted for evaluation or a grade.

As stated in the LEE UNIVERSITY Catalog, plagiarism is presenting as your own work the words, ideas, opinions, theories, or thoughts which are not common knowledge. Students who present others' words or ideas as their own without fair attribution (documentation) are guilty of plagiarizing. Unfair attribution includes, but is not limited to, a direct quotation of all or part of another's words without appropriately identifying the source. It is also unfair attribution to have included a source within a Works Cited page without having carefully cited the source within the text of the document. Plagiarism also includes, but is not limited to, the following acts when performed without fair attribution:

- a. Directly quoting all or part of another person's words without quotation marks, as appropriate to the discipline.
- b. Paraphrasing all or part of another person's words without documentation.
- c. Stating an idea, theory, or formula as your own when it actually originated with another person.
- d. Purchasing (or receiving in any other manner) a term paper or other assignment, which is the work of another person, and submitting that work as if it were one's own.

### Late Policy:

- No credit is available for postings of any kind made in the **Threaded Discussions** after a given unit ends.
- If your faculty approves your submission of late assignments, each assignment score will be penalized 10% per day up to five days late. After the fifth day, late assignments will not be

accepted. (Note: An assignment is a paper, a project, a team presentation, etc., **not** a discussion)

- No late assignments will be accepted after the close of the final unit.

## EXPECTATIONS

### Faculty Expectations of Students:

- Have consistent access to a computer and possess baseline computer and information skills prior to taking online courses.
- Log into their courses within 24 hours of the beginning of the session to confirm their participation. (Students who register after the session has begun will be responsible for any assignments or material already covered.)
- Take an active role in each unit, participating fully in discussions, assignments and other activities throughout the entire session. If some event interferes with that participation, the student is responsible for notifying the instructor in advance.
- Review the course syllabus and other preliminary course materials thoroughly as early as possible during the first few days of the course.
- Be responsible for raising any questions or seeking clarification about these materials, if necessary, within the first week of the session.
- Frequently check the course calendar for due dates.
- Submit assignments and papers on time, and take tests by the posted dates. Acceptance of late work and any penalties for late submissions are up to the discretion of the instructor, based on the expectations outlined in the course syllabus.
- Contribute meaningful, timely comments to online discussions according to guidelines provided.
- Contribute substantively to group assignments (if required in course).
- Check for University announcements each time you log onto the LMS. These postings are critical.
- Use Lee email address.
- Complete the "Student Survey of Instruction" for each course to evaluate the instructor and the course.

### Students' Expectations of Faculty:

- The opportunity to be active participants in a stimulating and challenging education that is global in scope, interactive in process and diverse in content and approach.
- A friendly, respectful, open, and encouraging learning environment.
- A course outline or syllabus that clearly provides information regarding course content, teaching methods, course objectives, grading, attendance/participation policies, due dates, and student assessment guidelines.
- Instructors who are responsive and available to discuss within 48 hours students' progress, course content, assignments, etc. at mutually convenient times from the first day of the session through the last day of the session. (Check the faculty contact information regarding weekends and holidays.)



- Individual instructor's contact information, schedules, availability, and procedural details are located within the course.
- To have access to instructor feedback and grading on projects, exams, papers, quizzes, etc., within ten (10) days of assignment due date so students are able to determine where they have made errors or need additional work.
- Final grade/feedback provided within ten (10) days after the last date of course.

## IMPORTANT STUDENT INFORMATION

### Special Needs:

Lee University, in conjunction with the Academic Support Office, works to ensure students with documented disabilities have access to educational opportunities. Students who need accommodations based on a disability should visit the Academic Support Office, call (423) 614-8181, or email [academicsupport@leeuniversity.edu](mailto:academicsupport@leeuniversity.edu). It is the student's responsibility to share the Accommodations Form with the instructor in order to initiate the accommodations.

## BIBLIOGRAPHY

### Knowledge Base/Working Bibliography (Reading List):

Bluman, A. G. *Elementary Statistics, A Brief Version*, 6<sup>th</sup> Ed. New York: McGraw-Hill, 2012.  
Triola, M. *Essentials of Statistics*, 3<sup>rd</sup> Ed. Pearson: Boston, 2008. Print.  
*Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report: A PreK-12.*  
Franklin, C., G. Kader, D. Mewborn, J. Moreno, R. Peck, M. Perry & R. Scheaffer. *Curriculum Framework*. Alexandria: American Statistical Association, 2007. (Also available at <http://www.amstat.org/>).