



FREED-HARDEMAN
UNIVERSITY

UNDERGRADUATE COURSE SYLLABUS FOR TRADITIONAL AND WEB CONFERENCE COURSES

Course: MAT 235-01 Introductory Statistics
Semester: Fall 2020
Credit Hours: 3
Course Delivery: Traditional
Meeting Times: MTWTF 10:00 - 11:00
Classroom: W8

Instructor: Coach Showers
Credentials: B.S. in Mathematics, Freed-Hardeman University, 1993
M.Ed. in Mathematics, Freed-Hardeman University, 1995
18 Graduate Hours in Mathematics, The University of Memphis, 2018-2019

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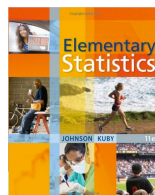
COURSE CONTENT

CATALOG DESCRIPTION: An introduction to basic statistical techniques, including frequency distributions, averages, data analysis, samplings, tests of hypothesis, linear regression, chi-square tests, and related areas in probability theory.

PREREQUISITES: Two years of high school algebra and a required proficiency score of 21 or better on the math portion of the ACT or proficiency score on the ACCUPLACER. Enhanced sections: Students not meeting the stated prerequisite must register for an enhanced section, MAT235E Introductory Statistics, that includes a mandatory math workshop.

REQUIRED MATERIALS:

- WebAssign access code. You may purchase this at the bookstore or online.
 - To register for the course on WebAssign, go to <https://webassign.net/>, select "Enter Class Key," and follow the directions using the following Class Key: **fhu 3537 2101**
- Graphing calculator, preferably TI-Nspire
- Computer
- Optional: With your WebAssign access code, you will have access to the electronic textbook. If you want, you may also purchase a print copy of the textbook: Johnson, Robert, and Patricia Kuby. *Elementary Statistics*. 11th ed. Belmont: Thomson Brooks/Cole, 2012. ISBN: 9780538733502.



LEARNING OUTCOMES: Upon successful completion of this course, students will be able to demonstrate the following learning outcomes.

CHAPTER 1: STATISTICS

- Distinguish between descriptive and inferential statistics
- Distinguish between a population and sample
- Distinguish between a parameter and a statistic
- Identify variables and classify them as qualitative or quantitative
- Classify qualitative variables as nominal or ordinal
- Classify quantitative variables as discrete or continuous
- Identify the population, sample, variable, and parameter of interest in an experiment
- Distinguish between biased and unbiased sampling methods

CHAPTER 2: DESCRIPTIVE ANALYSIS AND PRESENTATION OF SINGLE-VARIABLE DATA

- Analyze pie charts, bar graphs, pareto diagrams, dotplots, and stem-and-leaf displays
- Analyze frequency distributions and histograms
- Compute measures of central tendency including mean, median, mode, and midrange
- Compute measures of dispersion including range, variance, and standard deviation
- Compute measures of position and related statistics including, percentiles, quartiles, midquartile, interquartile range, five-number summary, and standard scores (z-scores)
- Use the Empirical Rule and Chebyshev's Theorem to compute proportions (or minimum proportions) within specified regions of distributions

CHAPTER 3: DESCRIPTIVE ANALYSIS AND PRESENTATION OF BIVARIATE DATA

- Construct and analyze cross-tabulation charts, side-by-side charts, and scatter diagrams
- Compute and interpret the meaning of linear correlation coefficients
- Distinguish between correlation and causation
- Use linear regression to determine the equation of the line of best fit and use it as a prediction model

CHAPTER 4: PROBABILITY

- Distinguish between empirical, theoretical, and subjective probabilities
- Compute empirical probabilities for events based on observations
- Construct a sample space and use it to compute theoretical probabilities for events
- Construct tree diagrams and Venn diagrams
- Use the law of large numbers to explain the relationship between empirical and theoretical probabilities
- Compute the odds in favor of (or against) events
- Compute conditional probabilities
- Compute probabilities of complementary events
- Compute probabilities using the general addition rule and general multiplication rule
- Determine whether or not a set of events is mutually exclusive
- Compute probabilities using the special addition rule for mutually exclusive events
- Determine whether or not events are independent
- Compute probabilities using the special multiplication rule for independent events

CHAPTER 5: PROBABILITY DISTRIBUTIONS (DISCRETE VARIABLES)

- Construct probability distributions for discrete random variables
- Determine whether or not a function is a probability function
- Compute the mean, variance, and standard deviation for a discrete random variable
- Determine whether or not an experiment is a binomial probability experiment
- Compute binomial probabilities
- Compute the mean, variance, and standard deviation for a binomial variable

CHAPTER 6: NORMAL PROBABILITY DISTRIBUTIONS

- Identify basic characteristics of the standard normal distribution
- Determine areas bounded below the standard normal distribution by specified z-scores
- Determine z-scores that bound specified areas under the standard normal distribution
- Compute probabilities for normally distributed variables
- Determine values of normally distributed variables that satisfy specified conditions
- Use the $z(\alpha)$ notation to identify z-scores and compute related probabilities

CHAPTER 7: SAMPLE VARIABILITY

- Construct sampling distributions of sample means
- Identify basic characteristics of sampling distributions of sample means
- Compute the mean and standard deviation (standard error) for a sampling distribution of sample means
- Describe the shape of sampling distributions of sample means using the Central Limit Theorem
- Compute probabilities about sample means

CHAPTER 8: INTRODUCTION TO STATISTICAL INFERENCE

- Construct confidence interval estimates for population means (with σ known)
- Compute maximum errors for interval estimates of population means (with σ known)
- Compute minimum sample sizes needed to ensure specified maximum errors at given levels of confidence for interval estimates of population means (with σ known)
- Perform hypothesis tests concerning population means (with σ known)

CHAPTER 9: INFERENCE INVOLVING ONE POPULATION

- Identify basic characteristics of t-distributions
- Use t-distributions to compute probabilities
- Construct confidence interval estimates for population means (with σ unknown)
- Perform hypothesis tests concerning population means (with σ unknown)
- Construct confidence interval estimates for population proportions
- Perform hypothesis tests concerning population proportions
- Compute minimum sample sizes needed to ensure specified maximum errors at given levels of confidence for interval estimates of population proportions
- Identify basic characteristics of χ^2 – distributions
- Use χ^2 – distributions to compute probabilities
- Perform hypothesis tests concerning population variances (or standard deviations)

CHAPTER 10: INFERENCE INVOLVING TWO POPULATIONS

- Distinguish between dependent and independent samples
- Construct confidence interval estimates for mean differences (dependent samples)
- Perform hypothesis tests concerning mean differences
- Construct confidence interval estimates for differences between means (independent samples)
- Perform hypothesis tests concerning differences between means
- Construct confidence interval estimates for differences between proportions (independent samples)
- Perform hypothesis tests concerning differences between proportions

METHODOLOGY:

This course will be taught primarily through lecture. Students are encouraged to ask questions and participate in class discussions. The lectures will usually consist of explanations of content, illustrated with sample exercises. Some parts of the course will be computer and/or calculator active.

COURSE OUTLINE

Test	Tentative Date	Content
Test 1	September 20	Chapter 1 - Statistics Chapter 2 - Descriptive Analysis and Presentation of Single-Variable Data Chapter 3 - Descriptive Analysis and Presentation of Bivariate Data
Test 2	October 11	Chapter 4 - Probability Chapter 5 - Probability Distributions (Discrete Variables)
Test 3	October 25	Chapter 6 - Normal Probability Distributions Chapter 7 - Sample Variability
Test 4	December 6	Chapter 8 - Introduction to Statistical Inferences Chapter 9 - Inferences Involving One Population
Final Exam	December 19	Comprehensive exam covers all material including Chapter 10 Chapter 10 - Inferences Involving Two Populations (as time permits)

GRADING POLICY

ASSIGNMENTS AND TESTS: Grades in the course will be determined based on the following:

- **Homework Assignments:** Practice exercises are an integral part of the learning process in this course. Homework assignments will be completed online using WebAssign. Each assignment must be completed by the posted due date. Generally, students will be allowed a maximum of three attempts on each part of each homework problem.
- **Tests:** Tests will be given during the semester as outlined in this syllabus. Tests will be paper-based (not online), and students will be required to show work in support of answers. Students will be allowed to use a graphing calculator during testing. Each student must have his or her own calculator to use during testing. All other electronic devices (such as laptops and cell phones) must be silenced and put away during testing. The use of unauthorized electronic devices during testing will be considered cheating.
- **Final Exam:** A comprehensive final exam will be given at the end of the semester according to the exam schedule. All students must take the final exam at the scheduled time.

GRADING SCHEME: Final averages will be computed as given below.

$$\text{Final Avg} = 40\%(\text{Test Avg}) + 40\%(\text{Homework Avg}) + 20\%(\text{Final Exam Avg})$$

GRADING SCALE

Final averages will be rounded to the nearest whole number and letter grades for the course will be assigned using a scale no more stringent than:

A= 90-100

B= 80-89

C= 70-79

D= 60-69

F= 0-59

CLASSROOM POLICIES

ATTENDANCE

Class Attendance

Learning that occurs within the classroom is at the heart of the FHU experience. Student interactions with faculty and with other students, and the relationships that grow from those interactions, are instrumental toward achieving the University's student learning and spiritual formation outcomes. In cases of poor class attendance, accomplishment of these outcomes, as well as the capacity of the University to achieve its overall mission, is in jeopardy. The University has established there is a strong correlation class attendance and academic success as measured by semester grade point averages. Therefore, students are expected to attend class daily.

Students must attend at least 75 percent of all scheduled class meetings in order to receive academic credit for completing a class. Students who do not complete 75 percent of all scheduled class meetings will be dropped from that class and receive a grade of "WA." Every absence, whether excused or unexcused, will count when determining whether students have missed more than 25 percent of all scheduled class meetings. Absences due to late registration or change of class prior to the drop/add period will be included in the above percentage.

In extreme situations, students may appeal their grade of "WA" with an Academic Petition Form to the associate vice president for academics. This must be done within five school days following the dismissal from class. The student should continue to attend the class until the appeal has been decided.

Practicums, honors contracts, online courses, or individualized instructions are governed by separately published policies.

Excused Absences

Absences for officially approved school business, sponsored trips, athletic contests, illness accompanied by a doctor's note, or a death in the student's immediate family are excusable and will not be penalized, provided they are explained within one week of the student's return to class. These absences, and all excused or unexcused absences, will count toward the 75 percent class attendance policy. Sponsors should provide a written excuse to each student for all instructors affected by the absence, and they should send an electronic copy to the Office of Academics.

A faculty member may assign reasonable and relevant makeup work for excused absences. In case a student misses an examination and has an excused absence, the teacher may give a makeup examination or simply compute the average of the other grades. Final exams must be taken. A student may not be penalized for missing an examination when the student has a clearly demonstrated excusable absence.

Unexcused Absences

Penalties for absences that do not meet the *excused absence* criteria and tardiness will be left to the discretion of the teacher but must adhere to individual school parameters. Faculty members may assign reasonable and relevant makeup work, extend a deadline, or give a makeup examination for any or all missed assignments for an unexcused absence, but are not under obligation to do so.

Bible Class Probation

The first time a full-time, undergraduate student has excessive absences in his/her only Bible course, the student will be withdrawn from the class, will receive the grade of a "WA," and will be placed on Bible Class Attendance Probation. A student placed on Bible Class Attendance Probation must sign a Bible Class Attendance Contract in the Office of Academics prior to completing the current semester and before registering for the next semester. Bible Class Attendance Probation will continue through graduation. A full-time undergraduate student who is on Bible Class Attendance Probation and who has excessive absences in his/her only Bible course in a subsequent semester will be withdrawn from the Bible class with a grade of "WA" and will be suspended from the University at the end of the semester.

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Specific application of the attendance policy to this course

Maximum Number of Absences: Based on the number of days this course meets during the semester, a student who accumulates **11** or more absences will have missed more than 25% of the class meetings for the course; therefore, any student who misses **11** or more class meetings, for any reason, will be dropped from the class and receive a grade of WA—Withdrawn Administratively. Like the grade F, the grade WA earns 0 quality points.

Tardiness: A student is tardy if the student arrives after the start of the class period but before 15 minutes of class have passed. A student who is more than 15 minutes late to class will be considered absent, rather than tardy. At the beginning of each class, the instructor will check attendance. Students who are not present will be marked absent. A student who is tardy should not interrupt the class but should enter the classroom with as little disruption as possible. At the end of the class, the student should request that the instructor change the student's attendance from absent to tardy. It is the responsibility of the student to request this change at the end of the class on the day the tardiness occurs; otherwise, the student may be charged with an unexcused absence for the day. For every three times tardy, a student will be charged with one unexcused absence.

Leaving Class Early: The instructor will make every effort to begin and end class sessions on time. Students are expected to remain in their seats until the instructor dismisses the class. A student who leaves class early without prior permission from the instructor is subject to being counted absent.

MAKEUP WORK

Homework Assignments: Due dates for homework assignments may be extended for students in certain situations, such as when a student misses class and the absence is excused. Students may request an extension from the instructor by email (do not use the extension request feature in WebAssign). Due dates will not be extended in the case of unexcused absences.

Tests: If a student is to be absent on a test day and the absence is excused (see excused absences), then the student must arrange with the professor to take the test early, if possible; otherwise, the student will be required to take the test within an equivalent number of days as they were absent. If a student is absent on a test day and the absence is unexcused, then the student will receive a grade of 40% for the missed test.

Final Exam: All students are required to take the final exam.

ACADEMIC DISHONESTY

Academic dishonesty violates the Christian principles and standards of Freed-Hardeman University. The following are examples of intentional academic dishonesty:

- Cheating – using or attempting to use unauthorized materials, information, or study aids in any academic exercise. The term “academic exercise” includes all forms of work submitted for credit.
- Fabrication – falsifying or inventing any material in an academic exercise.
- Facilitating academic dishonesty – helping or attempting to help another to violate academic integrity.
- Plagiarism – adopting or reproducing another person's words or ideas without acknowledgement.

The minimum penalty for an obvious violation of academic integrity is a failing grade on the assignment. In addition, at the discretion of the instructor, the student may receive a failing grade for the course and be dropped from the class.

Academic dishonesty should be reported to the Dean of Students, who may prescribe additional penalties. No student may avoid receiving a failing grade for academic dishonesty by subsequently withdrawing from the course.

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Additional Information on Academic Dishonesty: In this course, the penalty for a first instance of academic dishonesty is a grade of zero for the specific assignment. A second instance of academic dishonesty will result in the student being dropped from the class with a grade of “F.”

BEHAVIOR

Students are expected to behave themselves in such a way that helps foster a positive learning environment for all. At the discretion of the instructor, a student may be asked to leave class and may be charged with an unexcused absence due to inappropriate classroom behavior. This includes any action that is deemed disruptive or distracting to the instructor or students.

DRESS CODE

Students are expected to abide by the dress code as defined by the Chester County Board of Education at all times.

TECHNOLOGY

Using Technology in the Classroom

Using electronic devices in the classroom can enhance or hinder learning outcomes. Thus, the following guidelines must be adhered to:

1. Cell phones and other communication devices should be turned off or silenced and not used while in class unless otherwise permitted by the instructor.
2. Electronic devices are to be used solely for purposes related directly to the class. This might include, but is not limited to, applications, note taking, viewing of presentation material, or instructor-directed Internet searches or projects. Use of electronic devices for reasons not directly related to the class is strictly prohibited.
3. Occasionally, an instructor may prohibit or limit electronic devices in the classroom. For example, an instructor may prohibit electronic devices during exams.
4. The instructor must state in the syllabus consequences for those who violate this policy.

www.fhu.edu/policy: Policy 3.2.2.26 Using Technology in the Classroom

Additional information on Using Technology in the Classroom

The unauthorized use of technology during tests or exams will be considered cheating and will result in a grade of zero on the test or exam. For each other violation of this policy, a student will be penalized one percentage point on his or her final average.

MINIMUM COMPUTING REQUIREMENTS

The following recommendations should be used when choosing a notebook (laptop) to use at Freed-Hardeman University. These configurations allow computers to run hardware and software in a manner to give our students the best learning experiences both inside and outside of the classroom.

The recommended hardware systems specified are sufficient to run new operating systems, as they are made available.

Note: The below recommendations represent basic computer configurations for students. Some courses or majors may require additional hardware and/or software to successfully complete the course. Contact your instructor or program coordinator for specific course requirements.

Important: FHU's learning systems will require high speed Internet access (1.5 Mb or higher).

Student Computing Standards: Minimum Configurations

	Minimum	Recommendation
Operating System	Mac OS X 10.12 Windows 10 (64-bit)	Mac OS X 10.13 Windows 10 (64-bit)
Processor	Intel i5 (2.0 GHz or higher)	Intel i7 (2.67 GHz or higher)
Memory	4GB RAM Minimum	8GB RAM
Disk Space	250GB Hard Drive Minimum	500GB Hard Drive or more Solid State Drive (Performance)
Wireless Network Access	802.11 n	802.11 n/ac
Other Hardware	Web Camera and Microphone	Web Camera and Microphone
Application Software	Microsoft Office	Microsoft Office

Additional Assistance

Contact the HelpDesk at <http://helpdesk.fhu.edu> or by phone at 731-989-6111 for additional assistance.

FOOD AND DRINK

Food, drinks and candy are not to be brought into classrooms with the exception of clear water.

www.fhu.edu/policy: Facilities and Campus Grounds, Section 4.1.1

DISABILITY SERVICES

Freed-Hardeman University is committed to providing equal opportunity in education to qualified students. The University looks to the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 for standards. Those students with a disability who are prevented from meeting course requirements in the way the course is regularly taught should contact the Office of Disability Services by phone (731) 989-6029 or by email mellis@fhu.edu. Students are required to provide documentation from an acceptable evaluator in order to receive accommodations.

The University will assist an individual who has a documented disability with appropriate accommodations and modifications; but does not, however, guarantee successful completion of a course or a program. Students must cooperate with the University and take responsibility for learning. Those with an approved accommodation plan should notify the instructor of any affected class within the first three days after receiving accommodations. Accommodations are not effective retroactively, and students are encouraged to register upon realization of need for services.

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RESOURCES

Math Tutoring Services: The Academic Success Center at FHU provides free math tutoring. For information, contact Connie Pritchard (cpritchard@fhu.edu 731-989-6061) or go to: <http://www.fhu.edu/academics/services/index.aspx>.

TIPS FOR SUCCESS

- **Make Sure You Meet the Prerequisites**—If you do not meet the prerequisites for the course, there is a chance you will not be able to succeed no matter how hard you try.
- **Attend Every Class and Take Notes**—Attend every class and take a complete set of notes. After class, go back over your notes, filling in gaps as needed and organizing them for future review. Stay engaged during the entire class and avoid distractions. Don't be afraid to ask questions and make comments.
- **Make Time to Study**—Allocate four to six hours per week of study time specifically for your mathematics course. Each study session should last between 30 and 60 minutes. Adjust as needed during the semester.
- **Complete All Homework Assignments and Reviews**—Begin working on assignments as soon as possible after the lecture on the material has been given so that the material is still fresh. Starting assignments early will also leave you time to seek help as needed. If the instructor provides reviews and/or sample tests, be sure to take advantage of the extra material.
- **Read Your Textbook**—Use part of your study time to read ahead in the textbook, reading the section(s) of material that will be discussed in class before the lecture. Make use of videos and tutorials embedded within the electronic textbook, if available. Create an outline of the material from each section, noting important formulas, and noting any questions you may want to ask in class.
- **Review Regularly**—Knowing that new material will likely build upon previous material, review material from previous sections regularly. Do not wait until a test is approaching to begin reviewing.
- **Find a Study Partner (or two)**—Find a study partner in the course whose ability is similar to yours. When working math problems, attempt the problems independently before asking for assistance. Do not make the mistake of using your study partner as a crutch.
- **Seek Additional Help**—If you are having trouble understanding the material, don't give up. Seek help from tutors or your instructor. Make use of the tutoring services on campus, or (if needed) hire a private tutor.