Mathematical Statistics
STAT 301/ Fall 2018

Instructor: Adam Childers / childers@roanoke.edu

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Office Hours: 12:00-1:00PM, Wednesday Friday,
           10:00-11:00AM,Thursday,
           and by appointment.

Meeting Time: 2:20-3:20 PM Monday, Wednesday, Friday

Meeting Place: Trexler 374

Required Text: *Mathematical Statistics with Application 7th Edition,* by Wackerly, Mendenhall, and Scheaffer.

Course Objective: The objective of this course is to expand our understanding of probability theory in order to clearly understand the role that it plays in statistics. We will investigate functions of random variables in order to define point estimators and understand their properties. While developing a strong understanding the theoretical aspects of statistical methods we will concurrently work on applied problems and handle real data sets.

Intended Learning Outcomes: By the end of this course, students will be able to ….
…understand and interpret multivariate probability distributions.
…identify relationships between random variables.
…articulate the connections between probability theory and statistic.
…describe the role the central limit theorem plays in probability and statistics.
…understand the properties of point estimators and their connection with point estimates.

Content: We will cover most of chapters 5 through 9 in the text as well as parts of chapter 16. Included in these chapters is:
- Multivariate Probability Distributions
- Functions of Random Variables
- Sampling Distributions and the Central Limit Theorem
- Estimators
- Properties of Point Estimators and Methods of Estimation
- Bayesian Methods

Tests: There will be three tests during the semester. They will be on
- Friday, September 21st
- Friday, October 26h
- Wednesday, November 30th

Homework/Assignments: Homework will be due each Wednesday that we do not have a test and be graded for completeness and correctness. The assignments will be posted on Inquire. Assignments will come from the book as well as projects using Mathematica, R, and Minitab.

Quizzes: We will have quizzes throughout the semester to help prepare for the tests.

Final Exam: The final exam will be cumulative and will be given on Tuesday, December 11th at 2PM.

Grading: Grades will be assigned based on written assignments, tests, and a final exam.

Tests	50%
HW/Assignments/Quizzes	30%
Final Exam	20%

A *tentative* guideline for determination of grade will then be:

A	> 93	B	83 – 86.9	C	73 – 76.9	D	63 – 66.9
A-	90 – 93	B-	80 – 82.9	C-	70 – 72.9	D-	60 – 62.9
B+	87 – 89.9	C+	77 – 79.9	D+	67 – 69.9	F	< 60

MCSP Conversation Series: Attending at least three MCSP conversation series event is required. Within one week of the lecture, a one page reflection paper will be due and will count as a quiz grade. Please upload them on Inquire.

Missed Test: I will not give make-up tests. If you miss a test and have discussed it with me before the class takes the test, I will use your final exam grade for replacement.

Make-up Work: No make-up work will be accepted. Any excused work will be replaced by the final exam.

Expected Hours of Work: This course expects you to spend at least 12 hours of work each week inside and outside of class.

Attendance: Attendance is required and expected and is crucial to be successful in this course. An absence that is not discussed with the instructor prior to class is considered unexcused. Regardless of whether the absence is excused or not, you are responsible for all the material covered in class.

Technology: Scientific calculators, Mathematica, R, Minitab will be used throughout the semester in the classroom and on assignments. Cell phones are expected to be turned off before entering the class and computers will be used in the classroom exclusively for academic purposes.

Academic Integrity System: The Roanoke College Academic Integrity System applies to all graded work in this course. Students are responsible for understanding and adhering to the Academic Integrity System. Among other things the Academic Integrity System prohibits giving or receiving unauthorized aid, assistance, or unfair advantage on academic work. Please note that having a phone or unauthorized electronic device out during a test is an academic integrity violation.