Statistical Methods I
STAT 210/ Fall 2019

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Office Hours: 1:10-2:10 AM, Monday, Wednesday, Friday, and by appointment.

Meeting Time: 12:00-1:00PM

Meeting Place: 228 Lucas Hall

Required Text: *Exploring the Practice of Statistics,* by Moore / McCabe / Craig

Course Objective: The objective of this course is to understand how to use statistical methods to describe data and make statistical inferences. We will start by learning how to collect data and design experiments. Next, we will focus describing data using graphical and numerical methods. Building our descriptive techniques, we will learn probability theory to understand how to make statistical inferences. Though out the course we will focus on statistical computing and clearly articulating our results.

Intended Learning Outcomes: By the end of this course, students will be able to …
…understand how to design an experiment and collect data.
…describe the key features of a data set using graphical and numerical methods.
…understand probability and how it relates to statistical inference.
…understand statistical inference and its limitations.
…clearly state a research question and pick an appropriate statistical method.
…use statistical software to organize and analyze data.
…articulate statistical methods and results to an audience of experts and non-experts.

Content: We will cover most of chapters 1 through 9 in the text. Included in these chapters is:
- Producing Data
- Designing Experiment
- Graphical Methods (Histograms, Dot Plots, Pie Charts, Bar Charts, Box Plots, Stem and Leaf Plots, Scatterplots)
- Numerical Methods (Mean, Median, Standard Deviation, 5-Number Summary)
- Correlation and Linear Regression (OLS)
- Probability Models and Random Variables
- Probability Rules
- The Binomial Distribution
- The Central Limit Theorem
- Inferences for 1 and 2 Sample Proportions (z-tests)
- Inferences for 1 and 2 Sample Means (t-tests)
- Chi-Square Test
- ANOVA

Tests: There will be three tests during the semester. They will be on
- Friday September 25th
- Friday, October 30th
- Friday, December 2nd

Technology: We will be using R and its companion integrated development environment Rstudio throughout the semester. Both are free and can be downloaded from the internet. Please see our Inquire page for complete instructions on getting set up.

Homework: Homework will be assigned daily and graded for both completeness and correctness.

R Assignments: Throughout the semester we will be completing data driven assignments that you will complete using the statistical software R. Your assignments will be graded for correctness, organization, and presentation. You can find the datasets on our course webpage at math.roanoke.edu/childers/STAT210.

Final Exam: The final exam will be cumulative and will be given on December 13th from 2:00-5:00PM.

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

Tests	40%
Assignments	40%
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 two 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.

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.

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.

Technology: We will be using R for all of our statistical computing. It is a free resource that free and user friendly. Please see the class Inquire page for instructions for downloading.

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.