

STA 6166, Spring 2021
Statistical Methods in Research I
Section 3H44

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Course Objective: Train graduate students in the sciences to interpret statistical results, plan and conduct experiments, and perform reproducible data analysis with R.

Textbook (optional): *An Introduction to Statistical Methods & Data Analysis, 7th Ed.*
Authors: R. Lyman Ott, Michael T. Longnecker, ISBN-13: 9780495017585

Other Materials: Course notes, datasets, and homework assignments will be available on the class website [e-learning](#).

Software: You will need a computer for the homework assignments. The software used in class will be R. We will have a few labs on how to install and use R.

Homeworks: There will be approximately 5-6 assignments. You will have at least one week to hand them in from the time they are announced. Assignments will total 100 points. Assignments are to be submitted electronically in e-learning. *Late homework will not be accepted and will receive a grade of 0.*

Grading: Homework assignments will count as 100% of your course grade, split evenly among the 5-6 assignments.

Letter grade distribution

	A 91 to 100	A- 87 to < 91
B+ 84 to < 87	B 80 to < 84	B- 77 to < 80
C+ 74 to < 77	C 70 to < 74	C- 67 to < 70
D+ 64 to < 67	D 60 to < 64	D- 55 to < 60
E < 55		

Course Policies: Due to the ongoing COVID-19 pandemic, masks are expected in the classroom.

Tentative schedule (may go through earlier topics more quickly):

Topic	Textbook Section
Introduction, Data Collection/Summaries, Populations/Samples	1.1-3.9
Probability, Random Variables, Graphical Representation	4.1-4.10
Sampling and Sampling Distributions, Estimating a Mean	4.11-4.16, 5.1-5.3
Statistical Tests for a Mean and Median	5.4-5.9
Comparing Two Population Means and Medians	6.1-6.6
Introduction to F, χ^2 Distributions, Inference on Variances	7.1-7.4
Introduction to Analysis of Variance and Experimental Design	8.1-8.3
1-Way ANOVA: Assumptions, Rank-Based Tests, Post-hoc tests	8.4-8.6, 9.1-9.5
Randomized Complete Block Design	15.1-15.5
Categorical Data Analysis: Estimating and Comparing Proportions	10.1-10.3
Contingency Tables, χ^2 -Tests, Odds Ratios	10.4-10.8
Introduction to Linear Regression	11.1-11.5
Correlation and ANOVA intro to Multiple Regression	11.6, 12.1-12.2
Multiple Linear Regression	12.1-12.7