

STAT 705, Data Analysis II -- Spring 2021

Instructor:

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Course Web Page: <http://people.stat.sc.edu/hitchcock/stat705.html>

Class Meeting Times: MW, 2:20 pm - 3:35 pm, LeConte College 210 **or via Blackboard Collaborate Ultra on live video**

Office Hours: Mon 1:05-2:00 pm, Tues 11:00 am-12:00 noon, Wed 1:05-2:00 pm, Fri 1:05-2:00 pm, or **please feel free** to make an appointment to see me at other times.

Textbook:

Applied Linear Statistical Models, 5th edition, by Kutner, Nachtsheim, Neter and Li.

Purpose: To provide a detailed exploration of analysis-of-variance-type modeling, including design and analysis aspects, to study advanced regression techniques, and to study models involving categorical data.

Prerequisite: Prerequisites are successful completion of STAT 704 and STAT 712.

Official Course Description: Continuation of STAT 704. Analysis of variance (fixed and random effects), analysis of covariance, experimental design, model building, other applied topics, and use of computer statistical packages.

Course Outline: Regression with Qualitative Predictors. Single-Factor Analysis of variance; Multi-Factor Analyses. Block Designs; Analysis of Covariance; Piecewise Regression. Specialized Designs. Nonlinear Regression; Logistic and Count Regression; Nonparametric Regression. Advanced Regression Techniques. Categorical Data Analyses (time permitting).

Homework:

Homework exercises from the textbook (and possibly other sources) will be assigned on the course web page. Due dates will be given on the course web page. Late homework will be penalized and will not be accepted after solutions have been posted. Please write up homework papers neatly and clearly.

Each student's homework must be done independently. You may ask each other informal questions about the homework, but everyone is to do his/her own work. If homework is found to be copied, all students involved will receive a 0. Of course, you may always ask me questions about the homework. [To be clearer, students can ask each other informal ORAL questions about homework, but cannot look at or copy each other's homework papers. All submitted homework must be their own work.]

Project: A project involving the analysis of real data using methods learned in this class will be due near the end of the semester. The first part of the project will be a preliminary proposal with a data description and the other part will be the final written report. More information will be given out later.

Exams: There will be two in-class midterm exams and a final exam. Exams may not normally be made up, except in extreme circumstances, for which written documentation of excuse (doctor's note, funeral notice, etc.) is required. If you suspect you may miss an exam day, it is important to contact me well in advance of the test date.

Grading: The course grade will be based on homework (20%), 2 midterm exams (22.5% each), and a final exam (25%) and a data analysis project (10%). A course average of 90-100 will result in an A, 87-89 a B+, 80-86 a B, 77-79 a C+, 70-76 a C, etc.

Learning Outcomes: The successful students will learn important principles of normal-model (and advanced model) inference and methods for data analysis, especially analysis of variance methods and nonlinear and generalized linear models. Successful students will be able to interpret and clearly communicate the results of common analyses.

Computing: Some problems in this course involve significant computations, and for these, we will learn to use the software packages SAS and R. You will be able to create a student account in **SAS OnDemand for Academics** in order to access (for free) SAS Studio. Instructions are given on the course web page. You will receive an enrollment link in an email from the course instructor. R is a free, open-source statistical programming language. Details about how to download R for free onto your home computer are posted on the course web page.

Honor Code: Every student has a role in maintaining the academic reputation of the university. It is imperative that you refrain from engaging in plagiarism, cheating, falsifying your work and/or assisting other students in violating the Honor Code.

Student Disabilities: Any student with a documented disability should contact the Student Disability Resource Center at 777-6142 to make arrangements for appropriate accommodations.

During Class: No cell phones may be on during class. Laptop computers must be put away during class time. Tablets (e.g., i-pads) may be used *only for note-taking*, only if flat on the desk like a traditional notebook. Students may not use tablets to look at web pages, play games, etc.

Course Schedule: MWF, Jan 11, 2021 - Apr 26, 2021, and note:
No class (MLK Day): January 18 (Monday)
Last day to withdraw without "WF" grade: March 27 (Saturday)
No class (Wellness Holiday): April 21 (Wednesday)

Exam 1: To be announced: sometime in mid-February

Exam 2: To be announced: sometime in late March

Final exam: Wednesday, April 28, 12:30 p.m.