STAT J515 SYLLABUS
Fall 2019

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TR 8:30-9:45 LeConte 210   grego@stat.sc.edu
Office Hrs: TTh 11-12:30

Bulletin Description Statistical Methods I (3). (Prereq: a grade of C or higher in MATH 122 or MATH 141; or both MATH 111 or higher and any statistics class). Applications and principles of elementary probability, essential discrete and continuous probability distributions, sampling distributions, estimation, and hypothesis testing. Inference for means, variances, proportions, one-way ANOVA, simple linear regression, and contingency tables. Statistical packages such as SAS or R.

Purpose of the Course To familiarize students in a variety of fields with modern statistical methods, including the general areas of data description, elementary probability, and statistical inference. To prepare students to further their study in statistical topics such as applied multivariate statistics, Bayesian data analysis, design of experiments, nonparametrics, time series, and sampling.

Text Required: *Statistics* (13th Edition), by J.T. McClave and T. Sincich, Prentice Hall, 2017. Supplements to the textbook material will be posted on the course webpage.

Disabilities If you qualify for accommodations because of a disability, please submit a letter to me from the Student Disability Resource Center in a timely manner so that your needs can be addressed. The Student Disability Resource Center determines accommodations based on documented disabilities. Contact: 777-6142, LeConte 112A; sadrc@mailbox.sc.edu; (sc.edu/about/offices_and_divisions/student_disability_resource_center/)

Learning Outcomes By the end of the term, students should be able to

- Demonstrate understanding of and be able to correctly use basic statistical terms.

- Recognize and evaluate variation in data using descriptive statistics, basic parameter estimation and hypothesis testing.

- Compare data sets using parameter estimation, hypothesis testing and analysis of variance.

- Recognize and evaluate relationships between two variables using simple linear regression.

- Demonstrate understanding of and be able to apply simple principles of probability.

Grading Grades will be weighted in the following way:

Exam 1 (in-class)	100 points
Exam 2 (in-class)	100 points
Homework/Classwork	100 points
Final Exam	100 points
Total	400 points

The grading scale will be:

90 to 100	A
85 to 90-	B+
80 to 85-	B
75 to 80-	C+
70 to 75-	C
65 to 70-	D+
60 to 65-	D
0 to 60-	F

In accordance with standards outlined in the *Graduate Studies Bulletin*, graduate students will be assigned additional work. The homework and each of the three exams will have supplemental problems at the graduate level that graduate students must complete. This work will count toward graduate students' overall score for a given assignment.

Blackboard and Course Webpage All classwork should be uploaded by the student via Blackboard. I will generally use Blackboard to manage assignments, though almost all course material will be posted on my website. The URL for the class web page is `people.stat.sc.edu/grego/courses/stat515`; the website is also available through Blackboard. The web page of Professor Karl Gregory (`people.stat.sc.edu/gregorkb/STAT_515_sp_2019/STAT_515_sp_2019.html`) has much useful information too; be sure to refer to it for different lecture notes and assignments.

Classwork and Homework

You are encouraged to discuss homework and class assignments with your classmates and me (weekly discussion forums in Blackboard will be available), but all such assignments must be written independently. Do not copy any part of another student's work or computer code. Incidences of cheating and academic dishonesty will be punished to the full extent allowed under university regulations.

Course Interaction I will be available in person in my office, by phone, and by e-mail. A weekly Discussion Board will be available in Blackboard to encourage student-student and student-instructor interaction.

Classroom Technology I will use the computer/LCD projection system extensively in class for demonstrations and introduction of computer software; all computing done by me in class will also be posted on the webpage. We will be using two computer packages throughout the course. Increased familiarity with SAS is an important program objective. In addition, R is an important resource for exploring statistical computing.

Both packages are available on the PCs in Gambrell's basement (use your Blackboard login userid and password). SAS is available on computers 1-3 and R is available on all computers in the Cooper Technology Lounge on Level 5 of Thomas Cooper Library. Nonetheless, students should strongly consider copies for laptop use, since limited access to labs can affect course success. SAS licenses are available for student use for $100 from USC (accessed via the Purchase Computer Software tab in Self Service Carolina); the licenses are in effect from 7/1/2019 to 6/30/2020. SAS Studio, an online version of SAS, is available for free through SAS OnDemand; the course enrollment link is included in Blackboard under Course Documents. Another free version of SAS Software, SAS University Edition, has recently become available; this link is included in Blackboard under Course Documents as well.

R is available for free download from the CRAN (Comprehensive R Archive Network) website (`cran.r-project.org`). I will be using RStudio, since so many students prefer RStudio IDE

(integrated development environment) as a better-integrated development platform than standard R; a free version can be downloaded (`www.rstudio.com`)–note that R must also be downloaded for RStudio to work. Our R examples will be embedded in R Markdown, a documentation preparation platform that you may find useful in preparing homework assignments.

Course Delivery Technology Course viewing information is available on Blackboard. The course can be watched live via Breeze/Adobe Connect (enter as a guest), or streamed/downloaded within 24 hours. Links to the lectures will automatically be posted to Blackboard under the Course Lectures Playlist (e.g., it appears in the upper left-hand frame of my version of Blackboard). I will use the computer extensively in class for demonstrations and introduction of computer software; all computing done by me in class will also be posted on the webpage.

Date	Assignment/Topic	Graded Work
8/22	Intro to R and SAS	
8/27	3.1-3.6, 3.8	
8/29	3.1-3.6, 3.8	
9/3	3.8, 4.1-4.3	
9/5	3.7, 4.4, 4.6	HW 1 (Chapter 3)
9/10	4.4, 4.6, 5.1-5.3	
9/12	5.3-5.4	HW 2 (Chapter 4)
9/17	4.5, 5.6, Poisson/Exp Supp	
9/19	6.1-6.4, 5.5	HW 3 (Chapter 5)
9/24	6.3-6.4, 5.5, Ch 6 Supp	
9/26	Exam 1	
10/1	Ch 6 Supp	
10/3	7.1-7.3	HW 4 (Chapter 6)
10/8	7.4, 7.6, 9.6, AC Article	
10/10	No class (Fall Break)	
10/15	7.5, 8.1-8.4	HW 5 (Chapter 7)
10/17	8.4-8.5	
10/22	8.8, 9.6, Proportion Supp	
10/24	9.1-9.4	HW 6 (Chapter 8)
10/29	9.1-9.4	
10/31	8.7, 8.7 Supp	HW 7 (Chapter 9)
11/5	14.3, 14.3 Supp	
11/7	Exam 2	
11/12	10.1-10.2, 10.2 Supp	
11/14	10.1-10.2, Supp, 11.1	HW 8 (Chapter 14)
11/19	11.1-11.3	
11/21	11.3-11.5, Supp	HW 9 (Chapter 10)
11/26	11.6	
11/28	No class (Thanksgiving)	
12/3	13.1-13.3 , Supp	HW 10 (Chapter 11)
12/5	13.1-13.3, Supp	

The final exam will be Thursday, December 12 at 9 AM