Syllabus: STAT 509 Statistics for Engineers

2017 Summer I Section

Instructor: Shiwen Shen

Class Time/Place: 8:30-9:55 am MTWR in LeConte 113 (from Monday, May 8 to Friday, June 23)

Prerequisite: MATH 142 or equivalent

Office: 209F LeConte College

Office Hours: 10:10-11:00 am MTWR or by appointment

Email: sshen@email.sc.edu

Course Webpage: http://people.stat.sc.edu/sshen/17smstat509.html

Textbook:

Montgomery, D. and Runger, G. (2014). *Applied Statistics and Probability for Engineers*, Sixth Edition. John Wiley and Sons, Inc.

Course Overview: This course is an introduction to probability and statistics at the undergraduate level. Applications in engineering will be emphasized. We will discuss the following topics:

- *Probability and distributions:* Sample spaces; events; probability laws; discrete and continuous random variables; probability mass/density functions; cumulative distribution functions; means and variances; percentiles; reliability.

- *Estimation and statistical inference:* Sampling distributions; the central limit theorem; one/two-sample statistical inference involving means, variances, and proportions.

- *Regression:* Simple/multiple linear regression; least squares; estimation and prediction; confidence intervals and hypothesis tests; one-way analysis of variance; 2×2 factorial trestment structures and generalizations.

Learning Outcomes:

By the end of the semester successful students should be able to do the following:

- Understand and be able to correctly use basic statistical terminology.

- Make statistical inference using basic parameter estimation and hypothesis testing.

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

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

- Apply basic 2×2 design of experiments in order to study and improve engineering processes.

Computing:

We will use R, one of the standard and free statistical softwares. It is OK if you do not know R, because you will learn by example. You can download R at here for Windows, Linux, or Mac OS X system. The "An Introduction to R" manual available at here is an excellent resource.

Homework and Quiz:

After each lecture, I will assign homework problems based on material you have learned. For your benefits, I highly suggest you to finish these problems prior to the begining of the next class. It will help you develop a more in-depth understanding of the material and make the following class easier. Working together on homework assignments is encouraged. Form a study group will lead to a win-win situation to all students included.

Homework solutions will be posted on the same day, or the next day. Homework will not be collected or graded. Instead we will have in class quiz every Monday starting on May 15, in which homework problems will be selected to check whether students finish assignments on time. There will be 5 quizzes in total.

Exam:

We will have one midterm exam and one final exam. The midterm will be on **Tuesday, May 30**. The final exam will be given in our classroom on **Friday, June 23, 9:00 am**. Exams are all closed-book and closed-notes.

Please note that I do not give make-up exams. If your absence is due to a university function, you have given me appropriate documentation, and you have discussed it with me **at least one week in advance**, I will use another exam score to replace the absent one.

Grade Breakdown:

Your course grade will be determined by your performance on quizzes ($5 \times 10\% = 50\%$), the midterm exam (25%) and the final exam (25%). Final course grade will be assigned according to the following protocol, A=[90, 100); B+=[87, 90); B=[80, 87); C+=[77, 80); C=[70, 77); D+=[67, 70); D=[60, 67); F=[0, 60).

Daily Schedule:

	Monday	Tuesday	Wednesday	Thursday	
5/08 week	First class				
5/15 week	Quiz 1				
5/22 week	Quiz 2				
5/29 week	No Class	Midterm Exam			
6/05 week	Quiz 3				
6/12 week	Quiz 4				
6/19 week	Quiz 5			Last class	6/23 Final Exam

Expectations for Classroom Behavior:

All cell phones are to be turned off or silenced during class (not on vibrate). All cell phones are to be put away out of view during class; there is no text messaging, web browsing, etc, during class. Please be respectful of each other, the instructor, and any guest while in class. We are all here to learn! Any disrespectful or disruptive behavior may result in your referral to the Office of Student Judicial Programs.

Recommended Study Habits:

- Attend every class and be on time.

- Finish homework problems before the next lecture.

- Ask questions if you do not understand something or wish to know more.

- Check email often for announcements.

- Form small study groups to work on homework and to prepare for the exams/quizzes.

- Email me and/or drop by my office as soon as possible if you have any questions.

- Make it your goal to understand everything we do.

Academic Integrity:

Students are expected to follow the University of South Carolina Honor Code and should expect that every instance of a suspected violation will be reported. Students found responsible for violations of the Code will be subject to academic penalties under the Code in addition to whatever disciplinary sanctions are applied. Cheating on an exam or copying someone else's work, will result in a 0 for the work, possibly a grade of F in the course, and, in accordance with University policy, be referred to the University Committee for Academic Responsibility and may result in expulsion from the University.

Graduate Students:

Graduate students taking this course will be required to do a course project, which will be assigned at mid-semester (after the midterm exam). It will account for 10% of your final grade, while other quizzes and exams will be scaled down by 90%.

Accommodating Disabilities:

I would like to talk to anybody with a disability that may require special attention with examinations or other aspects of the course. Please talk with me no later than Thursday 5/11.