Syllabus: STAT 509 Statistics for Engineers

2016 Fall Section 003

Instructor: Shiwen Shen
Class Time/Place: 8:30-9:20 am MWF in 006 Gambrell (from Friday, Aug. 19 to Friday, Dec. 2)
Prerequisite: MATH 142 or equivalent
Office: 209F LeConte College
Office Hours: 9:20-10:20am MWF or by appointment
Email: sshen@email.sc.edu
Website: http://people.stat.sc.edu/sshen

Textbook:

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 treatment 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 $2 \times 2$ 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:
After each lecture, I will assign homework problems based on material you have learned. For your benefits, I highly suggest you 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.

Homework will be collected every Wednesday starting on August 24. Certain number of problems will be selected and each will be graded carefully by myself. Homework solution will be posted after each collection, so NO late submission will be accepted. You should write up your solutions neatly and staple the work together. The homework assignments are an important part of this course and are weighed heavily. Each will count towards your final grade (i.e. I do not “drop” any).

Working together on homework assignments is permitted and encouraged. However, each student must write up his/her solutions independently of others. Copying someone else’s work is not tolerated. If it happens, both parties will receive a 0 for the assignment as well as being reported to the Office of Academic Integrity.

Exam:
We will have three in-class midterm examinations. The first will be on Friday, September 23; the second on Friday, October 21; and the third on Friday, November 18. The final exam will be comprehensive and will be given in our classroom on Friday, December 9 at 9:00 am. Exams are all closed-book and closed-notes. Special note: No Programmable calculator is allowed in any exams.
Please note that I do not give make-up examinations unless 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.

**Grade Breakdown:**
Your course grade will be determined by your performance on homework (30%), the midterms (45% in total with 15% each) 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:**

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<td>9/7 HW collection 3</td>
<td>9/23 Exam 1</td>
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<td>12/2 Last class</td>
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**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 second mid-term exam). It will account for 10% of your final grade, while your final exam will only account for 15% of your grade.

**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 Monday August 29.