

# Syllabus

USC, Department of Statistics, Fall 2018

## Course STAT 712: Mathematical Statistics I

**Course overview:** This is the first semester of a two-semester sequence in mathematical statistics, taught at the graduate level. A mastery of calculus is assumed and higher level mathematics courses (e.g., real analysis, etc.) will aid in your understanding. This is a theoretical course, with an emphasis on writing proofs and derivations.

**Class Time:** 11:40 am–12:55 pm Tuesday and Thursday (from Thursday, August 23 to Thursday, December 06)

**Class Place:** Leconte College 201A

**Instructor:** Dewei Wang

**Office:** Leconte College 219B

**Email:** [deweiwang@stat.sc.edu](mailto:deweiwang@stat.sc.edu)

**Office Hours:** 1:15–2:15 pm on Tuesday and Thursday in Leconte College 219B

**Course Website:** <http://people.stat.sc.edu/wang528/Stat%20712/STAT712.html>

**Textbook:** Casella, G. and Berger, R. (2002). *Statistical Inference*, Second Edition.

**Topics Covered:** We will cover most of the material in Chapters 1-5 from Casella and Berger. In particular, we will discuss

- Probability (Chapter 1). Axiomatic foundation of probability, conditional probability, random variables, distribution and density/mass functions
- Transformations/Expectations (Chapter 2). Functions of random variables, expectation, moment generating functions
- Common Distributions (Chapter 3). Discrete and continuous distributions, exponential families, location-scale families, inequalities
- Multivariate Distributions (Chapter 4). Joint, marginal, and conditional distributions, independence, transformations, hierarchical models, covariance and correlation.
- Sampling Distributions (Chapter 5). Distributions of sums of random variables, Central Limit Theorem,  $t$  and  $F$  distributions, order statistics, stochastic convergence.

### Attendance:

I expect you to attend every class. Very few students are able to master this material without keeping up on a regular basis. When you miss class, you miss important information. If you are

absent, you are responsible for learning materials covered in class. If you are absent when an assignment is due, you must have submitted the assignment prior to the due date to receive full consideration.

### **Homework:**

I will give numerous homework assignments throughout the semester. In addition to the homework, I encourage you to work out solutions to other problems in the text and other extra problems I assign. This is really the best way to learn the material and much can be learned by doing (or at least reading) extra problems.

### **Exam:**

We will have two midterms, one after Chapters 1–2 and one after Chapters 3–4. We will have a cumulative final examination on Tuesday, December 11 at 12:30pm. Each exam may consist of two parts: an in-class part and a take-home part. Please note that I do not give make-up examinations.

### **Grade Breakdown:**

Your course grade will be determined by your performance on the two midterms (25 percent each) and the final exam (50 percent). Final course grades will be assigned according to a 85-75-60-50 scale. I will use your homework scores as guidance on whether to adjust your final grade in the event that you are near the boundary of a grade cutoff (e.g., 84, 59, etc.).

### **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.

### **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, August 30, 2018.

Note that reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email [sasds@mailbox.sc.edu](mailto:sasds@mailbox.sc.edu), or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.