

STAT 712 fa 2022 Mathematical Statistics I

Time/place: 11:40 AM - 12:55 PM Tuesday and Thursday, LeConte College 206
Instructor: Dr. Karl Gregory
Email: gregorkb@stat.sc.edu
Office: LeConte College 216C (phone 777-3859)
url: <http://people.stat.sc.edu/gregorkb>
Office hours: See [course website](#).

Required textbook

The course will follow very closely the material in the first five chapters of the book:

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

I will post my lecture slides at the [course website](#).

Topics covered

- Probability Theory: Set theory, basics of probability theory, conditional probability and independence, random variables, distribution functions, density and mass functions.
- Transformations and Expectations: Distributions of functions of a random variable, expected values, moments and moment generating functions.
- Common Families of Distributions: Discrete distributions, continuous distributions, exponential families, location-scale families, inequalities and identities.
- Multiple Random Variables: Joint and marginal distributions, conditional distributions and independence, bivariate transformations, hierarchical models and mixture distributions, covariance and correlation, multivariate distributions.
- Properties of a Random Sample: Sums of random variables from a random sample, sampling from the Normal distribution, order statistics, convergence in probability, convergence in distribution, the delta method.

Grading

There will be about 10 homework assignments, to be submitted in class. There will be two exams during the semester (on *Tuesday, October 4th* and on *Thursday, November 10th*). The final exam will consist of a written exam on *Tuesday, December 6th, at 12:30 pm* as well as a 15-minute oral exam, which each student will complete during a one-on-one meeting with me to be scheduled on *Friday, December 2nd*. The oral exam will count for one half of the final exam grade. Each exam is worth 30% of the course grade, and the homework average is worth 10% of the course grade. The thresholds 90%, 87%, 80%, 77%, 70%, 67%, and 60% will be used to determine the assignment of the letter grades A, B+, B, C+, C, D+, and D, respectively. A grade of F will be assigned to those earning less than 60%.

Honor code

See the Carolinian Creed in the Carolina Community: Student Handbook Policy Guide. Violations of the USC Honor Code may result in a 0 for the work in question, and, in accordance with University policy, other punishments up to and including expulsion from the University.