Instructor: Joshua M. Tebbs
Course: Mathematical Statistics I
Class Time/Place: 8.05-9.20 MW in 201A LeConte
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Required Textbook:

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

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. 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.

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.

Exams: We will have two midterms, one after Chapters 1-2 and one after Chapters 3-4. We will have a cumulative final examination on Monday, December 11 at 9.00am. I plan to give midterm exams outside of class (in a closed-book, closed-notes setting) so that you can have more time. 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.).