STAT 453/553 Statistical Inference, Spring 2017

Lecturer: James Degnan
Office: SMLC 342
Office hours: MW 12:00-1:00 or by appointment
E-mail: jamdeg@unm.edu

Please include STAT453, or STAT553 in the subject line of the email to make sure I don't overlook your email.

Textbook: *Statistical Inference*, 2nd edition, by Casella and Berger.

Assessment

Grading will be based on (approximately) weekly homework and tests. Curves at the end of the course will be different for undergraduates versus graduate students.
Homework, 40%; Tests, 30%; and Final, 30%.

Tests are particularly important in this class for graduate students because the qualifying exam is an in-class test. However, the purpose of the course is not to "teach to the test". Some topics will be covered because they are important or interesting even if they are not suitable for a test.

Times of tests will be announced in class, so attendance is important to make sure that no tests are missed. Tentatively, there will be three tests in roughly weeks 5, 9, and 13, but this is subject to change.

In many cases, homework problems will be variations of problems that occur in Casella and Berger or other books. This is partly to give a greater variety of problems, and partly to make sure that not all homework problems have easily available solutions on the web. It is STRONGLY suggested to work problems from scratch rather than working backwards from a solution when a solution is available. Part of the goal of the course is to develop problem-solving skills for probability problems. Working backwards from solutions that are given is detrimental to this goal. Particularly for graduate students planning to take the qualifying exam, it is important to practice problem-solving without any hint of what the solution is.

Homework

Late homework will be penalized 10% per day. All homework must be printed (not emailed) and turned in either in class or to my office. Sliding homework under the office door is acceptable.

Disability statement

If you have a documented disability that will impact your work in this class, please contact me to discuss your needs. Youll also need to register with the Accessibility Resource Center in 2021 Mesa Vista Hall (building 56) across the courtyard east from the SUB.

Title IX statement
In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered responsible employees by the Department of Education (see pg 15 - http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: https://policy.unm.edu/university-policies/2000/2740.html

Learning outcomes
We'll cover mostly topics from the listed book.

- Families of distributions

- Sampling distributions

- Order statistics

- Types of convergence (in probability, in distribution, almost sure)

- Maximum likelihood

- Sufficiency and related concepts

- Methods for evaluating estimators

- Hypothesis testing

- Interval estimation

By the end of the class, the goal is that you will be able to:

- Derive some distributions of sample statistics

- Do exact inference for small samples when the Central Limit Theorem does not apply or is not optimal

- Justify using one estimator rather than other using criteria such as mean squared error, minimum variance, and unbiasedness, and in some cases prove optimality of some estimators

- Do hypothesis testing and confidence intervals for distributions other than the normal and t distributions.

- Use graphical techniques to display distributions and other results