

STAT 5150 (section 001)
Advanced Statistical Inference I
Fall 2022

Instructor: Wei Wang

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Class hours: Monday and Wednesday, 10:15 am - 11:45 am (EST).

Office hours: After class, email or by appointment.

Course description: This is a theoretical course on statistical inference. Topics include basic measure theory, random variables, distributions, moments, characteristic function, conditional expectation, central limit theorem, point estimation, hypothesis testing, and confidence intervals. If time permits, the EM algorithm, simulations and bootstrap will also be covered.

References:

Probability and Measure, P. Billingsley.

Mathematical Statistics, Basic Ideas and Selected Topics, Volume 1, 2nd edition, P. J. Bickel and K. A. Doksum

Statistical Inference, 2nd Edition, G. Casella and R. L. Berger.

Mathematical Statistics, 2nd Edition, J. Shao.

Course Prerequisites: STAT 4300, STAT4310, and MATH 2400.

Calculus (limit, supremum, infimum, continuity, differentiation, integration, Taylor expansion), linear algebra (vector, matrix, Jacobian matrix, Hessian matrix), point set theory (union, intersection, complement), undergraduate level probability and statistics (histogram, boxplot, scatterplot, t-test, etc.).

Software: We will use the free statistical computing software R (<http://www.r-project.org/>) frequently in class.

Homework: There will be biweekly homework assignments. Without a convincing reason, late homework will not be given full credit (25 points off every 24 hours). If you are not sure about your situation, ask the instructor in advance. No last minute notice.

Exam: There will be a take home final.

Grading: The final grade will be based 60% on homework, and 40% on the final exam. The solution must be in your own words. No plagiarism. Identical solutions will be marked zero. Points up to 50% will be deducted if no R code or R output. Independent work is expected for the final exam. No discussion or communication with other people. Otherwise, it will be considered cheating, and the exam paper will be marked 0. Regular classroom attendance and participation is required.