

STAT 971: Intro to Linear Stat Mod

2021 Spring

Lectures.

- M/W 1:30pm–3:00pm on Zoom

Visit the course Canvas site for Zoom links.

Instructor. Anderson Ye Zhang (ayz@wharton.upenn.edu)

Office Hours: Monday 3pm–4pm (using the same lecture Zoom link)

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Office Hours: TBD

Course Website. <https://canvas.upenn.edu/courses/1568631>. Please check the Canvas site for announcements, assignments, solutions, and other course materials.

Course Overview. This is an advanced graduate course on mathematical statistics, following up on the course STAT 970. Despite its name, this course is **NOT** about linear models. Course prerequisite is STAT 970. Topic to be covered including:

1. Basics
 - Stochastic convergence
 - Delta method
 - Concentration inequalities
2. Empirical Process
 - Uniform laws of large numbers: Rademacher complexity, VC dimension, symmetrization
 - Metric entropy: chaining, Dudley’s integral entropy bound
3. Asymptotics / Large-sample Theory
 - U-Statistics: projection
 - M-estimators: consistency, asymptotic normality, quadratic mean differentiability
 - Contiguity
 - Tests: asymptotic relative efficiency, local asymptotic normality

Textbook. *Asymptotic Statistics*, A.W. van der Vaart. Cambridge University Press, 1998.

High-dimensional statistics: A non-asymptotic viewpoint, Martin J. Wainwright. Cambridge University Press, 2019.

Course Requirements and Grading Policy. There will be some problem sets, one midterm and one final. Evaluation will be based on homework (30%), midterm (30%) and final (40%).

- The midterm will be an in-class exam (tentatively) taking place on Monday, March 8. You may bring your textbook and notes to the midterm.
- The final will be a take-home exam. Exam time and logistic details will be announced later.