STAT5030 Linear Models

Instructor: Dr. Yuanyuan LIN, Department of Statistics

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Consultation time: by appointment or walk-in
Lecture time: 15:30–17:~~30~~ **17:15**, Monday, LSB LT3

Tutor: Ms. Wang Tong

Contact: 3943 8522

Office: LSB 123 (Ms. Wang is currently exchanging at Yale University)

Course description:

This course introduces important and fundamental elements related to the area of linear statistical models. A brief review of linear algebra will be given to the students. The course has four main topics: 1) distribution theory: multivariate normal and related distributions, distribution of quadratic forms; 2) full-rank linear models: least squares estimation, maximum likelihood estimation, simultaneous confidence intervals, tests of linear hypotheses, generalized least squares;3) non-full-rank linear models: estimability, parameter estimation, testable hypotheses, estimability conditions; and 4) Advanced topics of linear models, for example, linear methods for regression, sparse modeling and the lasso, etc.

No nonliear estimation

Assessed items:

Several take-home assignments (around 15%-20%)

Final examination (around 80%-85%) *← early May.*

References:

(1) *Linear Models.* S.R. Searle. John Wiley & Sons

(2) *Linear Models in Statistics.* Alvin C. Rencher. John Wiley & Sons

(3) *The Elements of Statistical Learning (Data mining, Inference, and Prediction).* Trevor Hastie, Robert Tibshirani, Jerome Friedman. Springer.

(4) *Computer Age Statistical Inference(Algorithm, Evidence, and Data Science). Bradley Efron and Trevor Hastie.* Cambridge. *(2016, a new book)*