

## Statistics 552: Asymptotic Theory

MW 9:00-10:30am @ F50 JHMM

**Professor:** T. Tony Cai, [tcai@wharton.upenn.edu](mailto:tcai@wharton.upenn.edu), Office: 469 JMHH.

Office hours: Tuesday 9:15 - 11:00am.

### Textbook & Reference:

- *A Course in Large Sample Theory* by Thomas Ferguson. Chapman & Hall, 1996.
- *Asymptotics in Statistics: Some Basic Concepts* by Lucien Le Cam and Grace Yang. Springer-Verlag, New York, 1990.
- *Elements of Large-Sample Theory* by Eric Lehmann. Springer, New York, 2004.
- *Theory of Point Estimation* by Eric Lehmann. John Wiley and Sons, New York, 1983.

The course begins with the classical asymptotic theory. Topics include information inequality, delta method, variance-stabilizing transformation, Edgeworth expansion, and their applications. Asymptotic properties of the MLE including strong consistency and asymptotic normality will be covered. Superefficiency will also be discussed. In the second half of the course we focus on nonparametric function estimation. Topics include function estimation methods, minimax theory, two-point argument for minimax lower bounds, and adaptive estimation theory.

**Homework:** There will be occasional homework assignments.

**Exam:** There will be no exam.