

BSTA 622 Statistical Inference II
Fall 2020

Content:

This course focuses on theoretical statistics. We will cover a medley of classical statistical inferential methods, including the method of estimating equations, the asymptotic theory for maximum likelihood estimation, the generalized method of moment estimation, and inference by influence functions. This course will emphasize concepts, methods and theories, rather than applications. Successful completion of this course will provide you with a foundation in probability-based statistical inference.

Intended Audience:

The course is designed for Biostatistics Ph.D. students in their 2nd year or beyond. Students are required to complete Probability I (BSTA 620) and Inference I (BSTA 621) before taking this course. Exceptions may be made with permission of the instructor.

Instructor:

Jing Huang, PhD

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Office Hours: Wednesdays 3:30-4:30pm by appointment.

TA:

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Office Hours: TBD

Class Schedule:

Mon and Wed 9:30-11:00am via Bluejeans.

Textbooks:

Recommended, not required, textbooks:

Theory of Point Estimation, by E.L. Lehmann and G. Casella, Springer

Elements of Large-Sample Theory, by E.L. Lehmann, Springer

Asymptotic Statistics, by A.W. van der Vaart, Cambridge

Theoretical Statistics, by D. Cox and D. Hinkley, Chapman and Hall

Grading:

Homework: 40%. We will have 3-6 homework assignments. You are encouraged to discuss your homework among classmates, but each should write up his/her own assignments.

Midterm: 30%

Final exam: 30%

Both midterm and final exams will be close book.

Tentative Schedule

Date	Topics
Sep	2 Mathematics Primer
	9 Mathematics Primer
	14 Unbiased estimation and Unbiased estimating functions
	16 Unbiased estimation and Unbiased estimating functions
	21 Unbiased estimation and Unbiased estimating functions
	23 Statistical Information
	28 Statistical Information
	30 Statistical Information
Oct	5 Large Sample Theory
	7 Large Sample Theory
	12 Asymptotic Theory of Estimation
	14 Asymptotic Theory of Estimation
	19 Asymptotic Theory of Estimation
	21 Asymptotic Theory of Estimation
	26 Midterm review
	28 Midterm
Nov	2 Asymptotic Properties of the MLE
	4 Asymptotic Properties of the MLE
	9 Asymptotic Properties of the MLE
	11 Asymptotic Properties of the MLE
	16 Generalized Linear models
	18 Generalized Linear models
	23 Generalized Method of Moments
	25 Influence Functions (no class, self-study at home)
	30 Influence Functions
Dec	2 Likelihood Functions (conditional, profile, plug in)
	7 Likelihood Functions (composite, partial)
	9 Final Review (Last lecture)
	14 Final Exam