

BSTA 622 Statistical Inference II
Fall 2019

Content:

This course focuses on theoretical statistics. We will cover a medley of advanced 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, 625 Blockley Hall.

TA:

Rong Ma

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Office Hours: Tuesdays 11am-12pm, 109 Blockley Hall.

Class Schedule:

Mon and Wed 9:30-11:00am, 701 Blockley Hall.

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 three homework assignments. You are encouraged to discuss your homework among classmates, but each should write up his/her own assignments.

Midterm: 20%

Final exam: 30%

Class participation: 10%

Both midterm and final exams will be in class and close book.

Tentative Schedule

Date		Topics
Sep	4	Mathematics Primer
	9	Mathematics Primer
	11	Unbiased estimation and Unbiased estimating functions
	16	Unbiased estimation and Unbiased estimating functions
	18	Unbiased estimation and Unbiased estimating functions
	23	Statistical Information
	25	Statistical Information
	30	Statistical Information
Oct	2	Large Sample Theory
	7	Large Sample Theory
	9	Asymptotic Theory of Estimation
	14	Asymptotic Theory of Estimation
	16	Asymptotic Theory of Estimation
	21	Asymptotic Theory of Estimation
	23	Midterm review (By Rong Ma)
	28	Midterm
	30	Asymptotic Properties of the MLE
Nov	4	Asymptotic Properties of the MLE
	6	Asymptotic Properties of the MLE
	11	Asymptotic Properties of the MLE
	13	Generalized Linear models
	18	Generalized Linear models
	20	Generalized Method of Moments (optional)
	25	Influence Functions
	27	Influence Functions
Dec	2	Likelihood Functions (conditional, profile, plug in)
	4	Likelihood Functions (composite, partial)
	9	Final Review (Last lecture)
	11	Reading days
	16	Reading days
	18	Reading days