Syllabus for

BSTA 620: Introduction to Probability

Fall 2018 Class 10:30-11:50 MW, Blockley Hall 415

Instructor Information:

Instructor: Hongzhe Li
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Office hours: By appointment

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Office hour: Thursday 3:30-4:30pm.

Textbook:

Statistical Inference, 2nd ed., George Casella and Roger L Berger

Lecture notes by G.A. Young (http://wwwf.imperial.ac.uk/~ayoung/m2s1/M2S12011.PDF)

Additional lecture notes for special topics

Homework: There will be a total of approximately 10 (almost weekly) problem sets – these will be given by email or posted on Canvas. Full solutions for the homework problems will also be posted on Canvas or provided by email. The best way to succeed in learning the class material is by fully working and understanding the assigned problems.

Exams: There will be a total of 2 exams – 1 midterm and 1 final exam. The exams will be closed-book with one page of notes allowed. The schedule for the exams is

- Midterm exam: October 17, 2018, 10:30am-12:00pm
- Final exam: December 17, 2018, 10:00am-12:00pm
Grading: Your grade is determined by a weighted combination of the homework and the exams according to the following weights:

Homework: 40%, Midterm exam: 20%, Final exam: 30%, Participation: 10%.

Prerequisites: Calculus, Linear Algebra, some Real Analysis

Outline of Topics to be Covered:

This is a fast-paced course that covers probability at graduate levels.

BASIC TOPCIS (Fast paced review).

- Axiomatic Probability
- Conditional Probability and Independence
- Random Variables, Definition, distributions, and expectation
- Discrete Distributions
- Continuous Distributions
- Joint Distributions of Random Variables, Sums of independent random variables, conditional distributions.
- Transformation, moment generating function and characteristic function
- Properties of random samples

ADVANCED TOPICS (As many topics as possible)

- Various modes of convergence.
- Limit Theorems Inequalities, weak/strong law of large numbers, central limit theorem
- Useful probability inequalities
- Basic Poisson process.
- Discrete Markov chain.