Syllabus for BSTA-620-001 2021C: Probability I

Lecture Schedule: Tues/Thu 10:15-11:45am Eastern, Aug 31 – Dec 9 at Blockley 701
No class on Sept 14

Midterm Exam: Thu Oct 21 10:15-11:45am Eastern at Blockley 701

Final Exam: Wed Dec 16 10am-12pm Eastern at Blockley 701

Textbook: Statistical Inference (2nd Edition) by George Casella and Roger L. Berger

TA: Sarah Hegarty (hegarty@pennmedicine.upenn.edu)
Sarah’s office hours: Thu 1-2pm (virtual)

Lecture Faculty:
Di Shu, PhD (Di.Shu@pennmedicine.upenn.edu)
Assistant Professor of Biostatistics, DBEI
Di’s office hours take place on Tues 4-5pm and are available by appointment only (virtual)

Grading: Course grade will be 10% class participation + 30% homework + 30% midterm exam + 30% final exam
Each homework assignment due at the beginning of class unless otherwise noted and posted on Canvas a week before the due date
Topics:
- Preliminary such as set theory
- Conditional probability and independence
- Random variables
- Distribution functions, and density and mass functions
- Common probability distributions
- Functions of a random variable
- Expected values and variances
- Moments and moment-generating functions
- Joint and marginal distributions
- Conditional distributions and independence
- Bivariate transformations
- Hierarchical models
- Covariance and correlation
- Multivariate distributions
- Probability inequalities
- Properties of a random sample
- Order statistics
- Convergence
- Law of Large Numbers and Central Limit Theorem
- Delta method