STATISTICS 523:
Advanced Theory of Probability
Spring 2017 Tentative Outline

The lectures in Math/Stat 523 will cover parts of Shorack's Chapters 13, 14, 15, further topics from Advanced Probability, including Stein's method and further material on central limit theorems. Then we will turn to properties of Brownian motion, embeddings, martingale central limit theorems, and (perhaps) stochastic calculus.

- PfS, Chapter 13. Characteristic functions
- PfS, Chapter 14. Central Limit Theorems via Characteristic Functions
- PfS, Chapter 15. Infinitely Divisible and Stable Distributions and processes
- Stein's method: an introduction.
- PfS, Chapter 12. Brownian motion, embedding, and empirical processes.
- Stochastic calculus. From:
  McKean, *Stochastic Integrals*; Chung and Williams, *Introduction to Stochastic Integration*.
- Martingale central limit theorems. From:
  Durrett, *Probability, Theory and Examples, 1st Ed.*; ??, and ??.