STATISTICS 521:
Advanced Theory of Probability
Autumn, 2019

Tentative Outline

The lectures in 521 will cover parts of Shorack's Chapters 1 - 5, 8 - 10; roughly Durrett's Chapters 1 and 2, and Appendix A

- Chapter 1. Measures
- Chapter 2. Measurable Functions and Convergence
- Chapter 3. Integration
- Chapter 4. Derivatives via signed measures
- Chapter 5. Measures and Processes on Products
- Chapter 8. Independence and Conditional Distributions
- Chapter 9. Special Distributions
- Chapter 10. WLLN, SLLN, LIL, and Series

STATISTICS 522-523:
Advanced Theory of Probability
Winter-Spring, 2020 Tentative Outline

The lectures in 522 will cover parts of Shorack's Chapters 6-7, 8, 11- 18.

- Chapter 6. General Topology and Hilbert Space
- Chapter 7. Distribution and Quantile Functions
- Chapter 8. Independence and Conditional Distributions
- Chapter 11. Convergence in Distribution
- Chapter 12. Brownian motion, embedding, and empirical processes
- Chapter 13. Characteristic Functions
- Chapter 14. Central Limit Theorems
- Chapter 15. Infinitely Divisible and Stable Distributions

The lectures in 523 will (tentatively) cover parts of Shorack's Chapters 18 and 12 and then further topics from Advanced Probability, possibly including Stein's method and further material on central limit theorems.

- Chapter 18. Martingales
- Chapter 12. Brownian motion, embedding, and empirical processes
- Stein's method.
- Central limit theorems via entropy