

**STATISTICS 522:
Advanced Theory of Probability
Winter, 2020**

Tentative Outline

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

- Chapter 8.
 - Section 8.5: Applications of the Laws of Large Numbers
 - Section 8.8: Convergence of Series of Independent RV's
- Chapter 7. Independence and Conditional Distributions
 - Section 7.4: Basic Properties of Conditional Expectation
 - Section 7.5: Regular Conditional Probability
- Chapter 9. Convergence in Distribution
(Characteristic Functions and Determining Classes)
- Chapter 14. Convergence in Law on Metric Spaces
- Chapter 10. Central limit theorems (CLT's)
 - Sections 10.0 - 10.5: CLT's via Characteristic Functions
 - Sections xx - yy: CLT's via Stein's method
- Chapter 11. Infinitely Divisible and Stable Distributions

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- Chapter 5, continued: Stochastic Processes.
- Chapter 13. Martingales.
- Chapter 12. Brownian motion and Empirical Processes.
- Chapter zz. An introduction to stochastic calculus.