

Topics for Probability Qualifying Examination  
MAT 721

**Topics**

- I. Basic concepts: probability measures, extension theorems (monotone class, Caratheodory, Kolmogorov), independence, expectation, Chebyshev's inequality.
- II. Laws of large numbers: weak law, strong law, Borel-Cantelli, Kolmogorov's 3 series theorem.
- III. Convergence: weak convergence, characteristic functions, Levy continuity theorem.
- IV. Central limit theorems: Feller-Lindeberg and Lyapunov theorems.

**Primary reference**

Rick Durrett's *Probability: Theory and Examples*, 4<sup>th</sup> edition.