Probability Preliminary Exam Syllabus

Department of Mathematical Sciences

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Probability measures. Existence and extensions. The Borel-Cantelli lemmas. Zero-one law. Simple random variables. Convergence of random variables in probability and almost-sure convergence. Measures in Euclidean spaces. Measurable functiosn and mappings. Distribution functions. Integrals with respect to Lebesgue measure. Product measure and Fubini's theorem. Distributions. Expected values. Inequalities and limit theorems for sums of independent random variables. Weak convergence. Characteristic functions. The central limit theorem.

This material is covered in MATH 7032 and STAT 7032.

Text:
P. Billingsley, *Probability and Measure*, 3rd edition (1995) or anniversary edition (2012).