Coverage of Math 7360-1 (Fall 2004)

Chapter 1 Review of elementary probability theory

1. Probability spaces and events
2. Random variables and distributions
3. Discrete random variables
4. Continuous random variables
5. Other random variables
6. Limit theorems
7. Central limit theorem and Sterling formula

Chapter 2 Construction of probability spaces

1. Probability spaces
2. Extension theorem of probability measures
3. Dynkin class theorem
4. Product measures
5. Kolomogorov's extension theorem

Chapter 3 Random variables

1. Distributions and distribution functions
2. Decomposition of distribution functions
3. Lebesgue integral and expectation
4. Limit theorems
5. L^p-spaces and basic inequalities
6. Computation of expectation
7. Independence

Chapter 4 Concepts of convergence

1. Types of convergence
2. L^p-convergence and convergence in measure
3. Almost sure convergence and convergence in probability
4. Applications of Borel-Cantelli lemma
5. Convergence in probability and convergence in distribution

Chapter 5 Law of large numbers

1. Weak law of large numbers
2. Strong law of large numbers
3. Glivenko-Cantelli theorem

Chapter 6 Convergence of random series

1. Random series
2. Maximum function and Kolmogorov's inequality
3. Three series theorem (part 1)
4. Lévy's equivalence theorem