

Syllabus

Theory of Probability Including Measure Theory, Math 8651, Fall 2008

Lectures: 10:10-11:00 MWF VinH 113
Instructor: Nicolai Krylov, VinH 225, tel. 625-8338,
krylov@math.umn.edu
<http://www.math.umn.edu/~krylov>
Office hours: MWF, 13:25-14:15
Textbook: A modern approach to probability theory
by B. Fristedt and L. Gray, Birkhäuser, 1997
Final examination: Take home final due on Saturday, Dec. 13, 2008

PREREQUISITE KNOWLEDGE: Some important prerequisite topics are uniform convergence, continuity, sequences and series of numbers and functions, Riemann integral, the topology (open, closed, compact sets, etc.) of the real line, and calculation skill in elementary calculus. The change of variables theorems for multiple integrals, Riemann-Stieltjes integration (to be also treated briefly in 8651), and metric spaces (which will also be treated briefly in 8651) will be useful from time to time. No previous course in either probability or measure theory is required.

APPROXIMATE OUTLINE OF THE COURSE (references to the textbook)

- Chapter 1, Probability spaces
- Chapter 2, Random variables
- Chapter 3, Distribution functions
- Chapter 4, Expectations: Theory
- Chapter 5, Expectations: Applications
- Chapter 6, Calculating probabilities and measures
- Chapter 7, Measure theory: Existence and uniqueness
- Chapter 8, Integration theory
- Chapter 9, Stochastic independence
- Chapter 10, Sums of independent variables
- Chapter 11, Random walks
- Chapter 12, Theorems of a.s. convergence

A few homeworks will be assigned and will form part of the final grade.