Syllabus

Theory of Probability Including Measure Theory, Math 8651,
Fall 2014

Lectures: 10:10-11:00 MWF VinH 206
Instructor: Nicolai Krylov, VinH 225, tel. 625-8338,
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http://www-users.math.umn.edu/~krylo001
Office hours: MWF, 13:25-14:15
Textbook: A modern approach to probability theory
by B. Fristedt and L. Gray, Birkhäuser, 1997,
you can download it from http://z.umn.edu/FristedtGray

Final examination: 8:00 a.m.-10:00 a.m., Wednesday, Dec. 17

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 text-
book)
• 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.
The grade for the worst homework (may be different for each student) will
be discarded. The final score will be computed as twice the average of best
homeworks plus the grade on the final examination.