

Instructor: Omer Angel.

Contact: angel@math.ubc.ca

Lectures: MWF 13:00-13:50 (note: may change after first week!) at LSK 462.

Course webpage: <http://www.math.ubc.ca/~angel/544>

Office hours: By appointment.

Text: *Probability Theory: A Comprehensive Course* by Achim Klenke, Springer 2006.

Course outline:

Together with Math 545 in term 2, these courses give a comprehensive introduction to (mathematically rigorous) probability theory for graduate students. The course is intended to be useful for those who use probability as a tool in other fields, or planning to do research in probability. (Probability theory has applications in analysis, statistics, finance, applied mathematics, combinatorics and number theory and has ties to many other fields.) Background in measure theory is not required, and the needed definitions will be introduced in class.

Topics will include the following. Probability spaces: random variables, expectation, modes of convergence, independence, Laws of Large Numbers, Borel-Cantelli, Kolmogorov and Hewitt-Savage 0-1 Laws. Characteristic functions, weak convergence, Central Limit Theorem, Poisson convergence. Random walks, stopping times, conditional expectation, Martingales, as well as various applications.

Further Reading

R. Durrett. *Probability: Theory and Examples*.

D. Williams. *Probability with Martingales*.

P. Billingsley. *Probability and Measure*.

O. Kallenberg. *Foundations of Modern Probability*.

D W. Stroock. *Probability Theory. An analytic view*.

K L. Chung. *A course in probability theory*.

L. Breiman. *Probability*.

Evaluation: The final mark will be based on homework (50%), and the final exam (50%).

Final Examination: will take place in the December examination period.