Syllabus for Math 3225, Honors Probability and Statistics

August 19, 2005

Instructor: Ernie Croot  
Office: 267 Skiles  
Office Hours: 1-2 Tuesday and Thursday.  
Place and Date of Classroom: MWF, 1:05 - 1:55 in Skiles 256.  
Book: Sheldon Ross’ Introductory Probability Models, Eighth Edition  
Grade: You grade will be based on 20% for each of two midterms, 30% homework, and 30% for the final exam. Homeworks will be collected about once every two weeks.

Material: In this course we will work through the foundations of probability theory, such as set theory, measure theory, conditional probability, expectation, variance, distributions, law of large numbers, central limit theorem, and so on. You will be required to understand and develop proofs as part of your homework; however, the proofs and theory will all be fairly basic.

We will also work through some interesting, exciting applications of the theory, such as applications to number theory, Bayesian spam filtering, statistical sampling and inference, Bayesian Networks and their application to artificial intelligence, and perhaps Hidden Markov Models with applications to gambling and speech recognition. I don’t know how many such applications I can include, however, because, for example, Bayesian Networks is a fairly deep subject and it would take a week to cover the background before applying it to expert system design.