MATH 6397
Stochastic Processes
Spring 2008

Class: TuTh 10:00am-11:30am, PGH 345
Instructor: Bernhard Bodmann, bgb@math.uh.edu
Office: Tu 2:30-3:20pm, We 2-3pm, PGH 636
Objectives: This course covers a wide range of topics in stochastic processes and applied probability. The emphasis will be on understanding the main ideas with a view to applications. Some group projects involving simulations will be given, but no computer programming experience will be assumed.

(1) Continuous time Markov chains: birth-death processes; Poisson processes; birth and death with absorbing states. Applications.
(2) Martingales and martingale convergence theorems. Stopping times. Brownian motion, properties of Brownian paths and applications.
(3) Renewal processes and the renewal equation. Applications.
(4) Stochastic differential equations and applications.
(5) Stationary processes, ergodic theorems, prediction of mean square error and covariance, applications of ergodic theory.
(6) Gibbs Fields and Monte Carlo simulations.

Recommended Texts:

Assessment: There will be one midterm (worth 30 points), a final exam (50 points) as well as 2 take-home problem sheets (20 points in total). A random subset of the problems on the take-home problem sheets will be marked.

Exam Dates: Midterm on Tu, March 11, 5:30-7pm, PGH 646; Final exam on Th, April 24, 5:30-8pm; PGH 646