

**STAT 654 - Spring 2014**  
**Introduction to Stochastic Processes**

**Professor:** Harry Crane  
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Office: Hill Center 461  
Office hours: Monday and Wednesday at 1:30 PM or by appointment

**Lecture:** M-W, 12:00-1:20pm HILL 552

**Textbook** (recommended): *Introduction to Stochastic Processes*, by Gregory Lawler

**Overview:** This course introduces stochastic processes with no measure-theoretic prerequisite. Notions from measure theory are introduced as needed, but are avoided whenever possible in favor of studying interesting aspects of stochastic processes. Specific topics to be covered are given below.

The course is intended for PhD students in statistics. For students interested in a PhD thesis in probability theory and stochastic processes, the course provides the foundation for higher level courses in probability theory. For students with other interests, the course develops important tools for all areas of statistical research.

**Topics covered:** exchangeability, branching processes, recurrent events, renewal theory, queuing theory, random walks, Markov chains, convergence rates of Markov chains and the cutoff phenomenon, Poisson point processes and birth-and-death processes, martingale theory, Brownian motion and related topics.

**Prerequisites:** STAT 592 (Theory of Probability) and an undergraduate course in real analysis.

**Midterm:** March 12, 2014

**Final:** To be determined

**Grading:** Grades are based on equal consideration of homework, midterm, and final.