**OR&IE 6500 Applied Stochastic Processes – Fall 2014**

An introduction to stochastic processes that presents the basic theory together with a variety of applications, assuming at least a one-semester calculus-based course in probability. A background in real analysis is an important advantage. The course covers tools (integration, transforms, inequalities), discrete-time Markov chains, martingales in discrete time, Poisson point processes, continuous-time Markov chains. Brownian motion and/or renewal theory will be covered if time permits.

Instructor: Shane Henderson sgh9

Office Hrs: 230 Rhodes Hall, MW 12-1

TA: Chek Hin (Michael) Choi cc2373

Office Hrs: TBA

**Text:** The required text is Resnick, S. I. 1992.

Adventures in Stochastic Processes, Birkhäuser, Boston.

**Blackboard:** HWs etc are distributed through blackboard.cornell.edu.

**Grading:**

Your final grade will be based on filling out the course evaluation (1%), homework (29%, equally weighted, lowest grade dropped), a preliminary exam (in class on October 2), and a final exam during the regular exam period. The prelim and final are weighted 30% and 40% **or** 0% and 70%, whichever is to your advantage. (This policy rewards students who improve over the semester.) Attendance at lectures and recitations is expected but not required. You are responsible for being aware of their content.

**Some Additional References:** (NOT required. Just for your interest or additional reading. Most are available on course reserve at Uris. Any edition is fine.)

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| **Author(s)** | **Title** |
| Ross, S. | Introduction to Probability Models, Academic Press (Lower level). |
| Ross, S. M. | Stochastic Processes. Wiley (same level) |
| Cinlar, E. | Introduction to Stochastic Processes, Prentice-Hall, Englewood Cliffs, New Jersey, 1975 (same level). |
| Gallager, R. G. | Stochastic Processes: Theory for Applications (same level) |
| Heyman D., and Sobel, M. | Stochastic Models in Operations Research, (Vol. 1), McGraw-Hill, 1982 (same level). |
| Karlin and Taylor | A First Course in Stochastic Processes, Academic Press, 1975 (same level). |
| Kulkarni, V. | Modeling and Analysis of Stochastic Systems (same level) |
| Wolff, R. | Stochastic Modeling and the Theory of Queues, Englewood Cliffs, NJ, 1989 (same level). |
| Billingsley, P. | Probability and Measure, Wiley. (Higher level). Any edition ok. |

Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student’s own work. For this course, collaboration is allowed only in the following instances: when preparing homework, you may discuss the problems together at the level of a discussion in a corridor, but you should write up your homework yourself. If you are unclear as to what constitutes excessive collaboration please ask!