Stat 8101, Spring 2014
Introduction to Stochastic Process

Basic Information

Instructor: Xu Han

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Class: Speakman Hall 211

Office hours: Tuesday 2:30pm-4:30pm or by appointment

Prerequisites:

Stat 8001 or an equivalent calculus-based course in probability theory.

Required textbook:

Sheldon Ross, Introduction to Probability Models, 10th Edition, Academic Press, ISBN-13: 978-0123756862. The 8th edition or the 9th edition are also fine.

Course description:

This graduate level course in stochastic processes will provide both the mathematical practice and intuition required for developing skills in modeling and analyzing processes that evolve over time and are commonly encountered in

A	A-	B+	B	B-	C+	C	C-	F
[90-100]	[85-90)	[80-85)	[75-80)	[70-75)	[65-70)	[60-65)	[55-60)	Below 55

statistics, sciences and business. The course will cover standard materials in stochastic models, conditional expectation, Markov chains, renewal processes, continuous time process, Brownian motions and Black-Scholes models. Proper preparation for this course would include a full year of undergraduate calculus, probability theory, as well as some exposure to the major concepts of linear algebra (e.g. eigenvalues/eigenvectors).

Grading:

Homework: 40%; Midterm: 30%; Final: 30%.

Homework:

Suggestions for reading and relevant homework exercises will be made during lectures and posted as an announcement on the Blackboard page. Specific exercises will be identified as composing a homework assignment for submission and grading. No late solutions will be accepted without prior authorization, which will typically only be granted to accommodate conflicts of due dates with job interviews or SOA/CAS examinations.

Midterm Exam

The midterm will be on Tuesday, March 18. It will allow for the opportunity to demonstrate ability to solve problems with more detailed solutions. The midterm, covering all lectures, readings, and homework leading up to it.

Final Exam:

The final exam will be take-home exam lasting one week after the study period. The final exam is cumulative. *Note: Each student's scores for homeworks and exams will be available to him/her via Blackboard. Therefore it is the responsibility of the student to ensure that their scores are correct in the gradebook and to report any discrepancies to the instructor in a timely manner. Requests for regrading a homework or exam made more than one week after the work was returned to the class will not be entertained.*

Tentative Schedule

Week	Topics
1	Review of Probability Theory
2	Conditional Probability
3	Compound Random Variables and Discrete Time Markov Chains
4	Classification of States and Limiting Probabilities
5	More Properties of Markov Chains
6	Markov Chain Monte Carlo and Time Reversible Markov Chains
7	Poisson Process and Review of Exponential Distribution
8	Poisson Processes Continued
9	Generalizations of Poisson Process
10	Continuous Time Markov Chains
11	Continuous Time Markov Chains 2
12	Renewal Theory
13	Renewal Reward Processes
14	Brownian Motion

The last day to withdraw from the course is Tuesday, March 25, 2013. No "Incomplete" grades will be assigned, except in very extreme and verifiable situations.