STA 447/2006S: Stochastic Processes (Winter 2016)

[See also the evolving lecture notes, to be updated after each lecture.]

STA 447/2006S is a course about random (stochastic) processes, designed for graduate and senior undergraduate students in statistics and related disciplines.

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Lectures: Thursdays, 6:10 - 9:00 p.m., in room 1069 of Sidney Smith Hall (building "SS" on campus map). First class Jan 14. Last class Apr 7. No class Feb 18 (Reading Week). During lectures, please **put away your laptops and cell phones** (unless you are using them specifically for a class-related purpose), and **pay attention** to the material being presented.

Course Web Page: Visit www.probability.ca/sta447 for course information and announcements.

Prerequisite: STA 347H. (Or equivalent, if you were an undergrad at a different university.)

Evaluation for STA447:
10% Homework #1 (assigned by Jan 28, due Feb 11 at 6:10 pm sharp);
25% Midterm test [sol] (two hours; 6-9pm on Thurs Feb 25 in HA401 [last name A-P] and HA410 [last name Q-Z]) **[BRING YOUR STUDENT CARD]**;
10% Homework #2 (assigned by Mar 3, due Mar 17 at 6:10 pm sharp);
10% Homework #3 (assigned by Mar 24, due Apr 7 at 6:10 pm sharp);
45% Final Exam (Mon Apr 18, 2:00-5:00, in room B150 of the Pharmacy (PB) Building, 144 College St) **[BRING YOUR STUDENT CARD]**.

Evaluation for STA2006: Identical to the evaluation for STA447 (above), except that each homework counts for only 9%, and the remaining 3% is for a short writing assignment (assigned by Mar 17, due Mar 31 at 6:10 pm sharp).

Office Hours: You are welcome to talk to the instructor after class, or any time you find him in his office, or you can e-mail him to arrange another time to meet. In addition, we have arranged **special TA office hours** before the midterm and homeworks are due, as follows: Tues Feb 9, 12:10-2:00, RW141; Tues Feb 23, 12:10-2:00, RW141; Tues Mar 15, 12:10-2:00, RW141; Wed Apr 6, 11:10-1:00, RW141; with four more hours coming before the final exam.

Tentative list of topics to be covered: Markov chains in discrete and continuous time, martingales, Poisson processes, renewal theory, and Brownian motion, with applications (as time permits) to Monte Carlo algorithms, random walks on graphs, branching processes, option pricing, queueing networks, and more.

Readings: There is no required textbook. The instructor will post his point-form lecture notes on this

course web page. In addition, the following books (among others) may be useful for further reading:

- R. Durrett (1999), Essentials of Stochastic Processes. Springer, New York. [See free online version of second edition.]
- G.R. Grimmett and D.R. Stirzaker, Probability and random processes, second edition. Oxford University Press, 1992. [Or: third edition, 2001.]
- J.S. Rosenthal (2000), A first look at rigorous probability theory. World Scientific Publishing Company, Singapore. (Chapters 7,8,14,15 only.)

Lateness policy: Homeworks are due at 6:10pm **sharp**. Lateness penalties are: 1-10 mins = 1 point; 11-30 mins = 2 points; 31 mins - 24 hours = 10% of total points; longer = (10% of total points) x (number of days late, rounded **UP**).

Regrading policy: Regrading requests should only be made for **genuine grading errors**, and should be initiated by writing or typing a complete explanation of your concern (together with your full name, student number, e-mail address, and telephone number) on a **separate piece of paper**, and giving this together with your original **unaltered** homework/test paper to the instructor **within one week** of when the graded homework or test was first available. **Warning: your mark may end up going down rather than up.** (Note: for final exams, a different Faculty-wide process is followed.)

This document is available at www.probability.ca/sta447 or www.probability.ca/sta2006, or permanently at www.probability.ca/jeff/teaching/1516/sta447/