

Introduction to Stochastic Processes Stat 433 / 533 Syllabus, Prof. Mossel, Spring 2016

Prerequisites. Knowledge of Statistics 430 is required. Graduate students who enroll to 533, should check that they understand and are able to solve problems from chapters 1-5 of the book "Introduction to Probability" by Bertsekas and Tsitsiklis. Students will also need to have a solid understanding of calculus of one and several variables. Some knowledge of matrix algebra and determinants is also required. To check if you're prepared for the course, there will be an in-class quiz during the first week of classes. Students who do not do well on the quiz will be encouraged to drop the class. Undergraduates interested in enrolling in Stat 433 and have not had Stat 430, need the permission of the instructor to enroll.

Required Texts. Durrett, Richard. *Essentials of stochastic processes*. Springer Science & Business Media, 2012 (2nd edition).

Topics. We will study some fundamental stochastic processes including Markov chains and Markov processes, Poisson processes, birth & death processes, branching processes and martingales. These processes play an important role in finance, insurance, computer science and engineering and many other areas. While the course will focus on theoretical concepts much of the motivation and many of the examples will come from the application areas.

Grading. There will be weekly homework which will count for 25% of the grade. There will be three mid-terms that will count for 25% of the grade each. The midterms will be given during class on Feb 24, Mar 23 and Apr 27. Students are expected to follow the principles of academic integrity of the University of Pennsylvania.

Midterms and Final. Note that there will be no final. There will be absolutely no early/late midterms.

Piazza details You should have received an invitation to the Piazza web-site for the course piazza.com/upenn/spring2016/stat433533/home. If you did not receive an invitation you can join using your upenn email address at piazza.com/upenn/spring2016/stat433533. If you have questions regarding the course, please use Piazza. Piazza will be also used for announcements and to post HW.

Homework Submission Details Homeworks are due at the beginning of class of the due date. No late homework. We will drop the lowest two h.w. grades. You are welcome to work on HW together in (disjoint) groups of up to 4 students each. Each student must write her own solutions. Please write your name, Penn ID and all your group member names on each submission. You are welcome to use any resource (including books, the internet and your friends) but you must fully cite any resource you have used in your homework.