

Statistics 433/533
Introduction to Stochastic Processes
Professor J. Michael Steele

Prerequisites: Knowledge of the material of Statistics 430 is required. 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.

If you have not had Statistics 430, then you need the permission of the instructor to enroll.

Required Texts:

- *Essentials of Stochastic Processes* (Springer Texts in Statistics, Second Edition) by Richard Durrett [ISBN-13: 978-1461436140 ISBN-10: 1461436141 Edition: 2nd ed. 2012]

Intellectual Scope: The core task is to lay the foundation for the mastery of the technology of stochastic process, especially Markov chains, Markov processes, Poisson processes, birth death processes, and branching processes. We will also develop some of the methodology of martingales. While the focus is on the development of fundamental skills and the mastery of key theoretical concepts, this is done with the expectation that most students will have in mind the applications of these tools in problems of business processes, manufacturing processes, information technology, service industries, and finance. The course is particularly suitable for students who intend to do further work in the areas of operations research, operations management, economics, finance, applied mathematics, or statistics.

Grading: There will be weekly homework that will count for 35% of the grade. There will also be an in-class mid-term that will count for 15% of the grade. The final exam will count for 50% of the grade. The final exam will be given at the time specified in the University Schedule of Examinations.

Academic Integrity: Students are expected to be scrupulously attentive to principles of academic integrity of the University of Pennsylvania.

Further Information: There is a publicly available website that supports the courses. If you Google *Steele Stat 433* you will find the current URL; if this fails look for the link on Steele's personal home page.