












Instructor:

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Department:

-  Statistics & Actuarial Science
-  SH 241
-  335-0712
-  Chair: Prof. Kung-Sik Chan
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Class Info:

-  MWF 9:30-10:20pm
-  71 SH

Exams:

-  Mid-Term I: Friday 09/23
6:30PM - 9:30PM 110 MLH
-  Mid-Term II: Friday 10/28
6:30PM - 9:30PM 110 MLH
-  Final: Finals Week, date TBD

TA Info:

-  Zongyi Xu
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Prerequisites

STAT:4100/5100 or equivalent course on probability theory. Also, a good course on linear algebra, *i.e.* a course in particular covering eigen values/vectors and eigen decomposition. Also, facility with a powerful computational platform like Python/R/Matlab is required. If in doubt, check with the instructor.

Learning Objectives

Markov chains: Discrete time with finite and countable state spaces; Continuous time with a finite state space
Poisson Process and Compound Poisson Process
Discrete time Martingales; Branching Process

Overview

This is the first course in a two-course sequence introducing stochastic processes - the second course is unfortunately sporadically offered. Also, it caters to a wide gamut of students, including terminal MS students in actuarial science and statistics and PhD students in computer science, math, and statistics. So it will be a challenging course for the instructor and the students. Nevertheless, it is worthwhile as the material is fun, filled with fantastic ideas, and widely applicable.

Text and Other Books

- D. Levin and Y. Peres, Markov Chains and Mixing Times, 2nd edition (Online)
- J. Norris, Markov Chains, Cambridge University Press
- R. Durrett, Essentials of Stochastic Processes, Version 3.9 (Online)
- D. Williams, Probability with Martingales
- Olle Häggström, Finite Markov chains and Algorithmic Applications
- S. Ross, Probability Models, nth Edition, Wiley
- S. Ross, Stochastic Processes, Wiley

Office Hours

Office hours will be held on Mondays and Wednesdays:
ICON will have zoom link for Mondays - 3:20pm -5:20pm
Office hour on Wednesday will be held in 241B between 3:20pm-4:20pm.

Grading Scheme

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| 20% | Homework: Assignments will be given to you by Friday of every week there is an assignment. They have to be electronically returned by the beginning of Friday's class of the following week on ICON. |
| 80% | Two Midterm Exams: 30% each for the two mid-terms and 20% for a take home final. |

Undergraduate and graduate students will be treated as two separate groups when it comes to assigning final grades. The course will be relatively graded with grades distributed according to applicable university guidelines along with the use of \pm grades.

Academic Honesty and Misconduct

All students in CLAS courses are expected to abide by the CLAS Code of Academic Honesty.

Student Complaints

Students with a complaint about a grade or a related matter should first discuss the situation with the instructor, and finally with the Director or Chair of the school, department, or program offering the course.

Undergraduate students should contact CLAS Undergraduate Programs for support when the matter is not resolved at the previous level. Graduate students should contact the CLAS Associate Dean for Graduate Education and Outreach and Engagement when additional support is needed.

Drop Deadline for this Course

You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a “W” will appear on your transcript. The mark of “W” is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the Registrar’s website. Undergraduate students can find policies on dropping and withdrawing here. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

University Policies

Accommodations for Students with Disabilities

Basic Needs and Support for Students

Classroom Expectations

Exam Make-up Owing to Absence

Free Speech and Expression

Mental Health

Military Service Obligations

Non-discrimination

Religious Holy Days

Sexual Harassment/Misconduct and Supportive Measures

Sharing of Class Recordings