ISyE 6762 Stochastic Processes II - Fall 2026

Instructor information

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Course information

ISyE 6762 introduces fundamental concepts in advanced stochastic processes. The course covers continuous-time Markov chains, Brownian motion, martingales, and selected concentration inequalities, with occasional discussions of measure-theoretic foundations. Supplementary readings will be drawn from standard references in the literature.

Prerequisites ISyE6761 (Stochastic Processes I)

Course Outcomes Upon successful completion of this course, students should be able to:

- Formulate and analyze continuous-time Markov chains, including transition dynamics and long-term behavior.
- Understand the construction and key properties of Brownian motion
- Apply the theory of martingales, including stopping times and optional stopping results
- Use concentration inequalities to derive probabilistic bounds for random processes
- Recognize and apply basic measure-theoretic concepts relevant to stochastic processes

Required Textbook

There is no fixed textbooks for this course. The following references might be useful.

1. Stochastic Processes, 2nd ed, Sheldon M. Ross. Chapter 5.
2. Brownian Motion by Mörters and Peres. Available at this link. Chapter 1.
3. Adventures in Stochastic Processes by Sidney Resnick. Chapter 6.
4. Probability: Theory and Examples by Rick Durrett. Available here. Chapters 1, 4.
5. Probability and Random Processes by Grimmett and Stirzaker. (few selected parts)

Grading Policy

1. Class participation: 5%
2. Homework assignments: 20% (Homework with the lowest score will be dropped)
3. Project: 15%
4. Midterm exam (tentatively October 12): 25%
5. Final exam (schedule provided by the Registrar's office): 35%

Thresholds for letter grade assignment are as follows.

Letter grade	Percentage range
A	90% ≤ total grade ≤ 100%
B	80%≤ total grade <90%
C	70%≤ total grade <80%
D	60%≤ total grade <70%
F	0%≤ total grade <60%

Course policies

Attendance Attendance is mandatory. You are allowed up to three non-excused absences without questions asked.

Academic Integrity Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct. Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Collaboration, Group Work, and Use of Generative AI You are allowed to work in groups on all homework and out-of-class assignments; however, any work you submit must be written in your own words. The use of generative AI tools (such as ChatGPT) is strictly prohibited during the midterm and final exam. For homework assignments and the project, limited use of such tools is permitted only as a learning aid—for example, to clarify advanced concepts or to refine the presentation of your work. Students are expected to rely primarily on their own understanding, reasoning, and creativity when producing submitted work.