

Stat/Math 416: Stochastic Modeling

Fall 2025

Instructor: Zhibiao Zhao

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Lecture: Tuesday and Thursday, 12:05pm–1:20pm, Benkovic Building 102

Office Hours: Wednesday 3pm–4pm (via Zoom)

Zoom: <https://psu.zoom.us/j/99976290554>

Teaching Assistant: Haochen Zhang

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Office Hours: Monday 1pm–2pm (via Zoom)

Zoom: <https://psu.zoom.us/j/5928168238>

Course Content

Topics covered include a brief review of elementary probability and expectation, conditional probability, conditional expectation, discrete-time Markov chains, Poisson process, continuous-time Markov chain and their applications (birth and death processes).

Course Goals and Objectives

The goal is to introduce students to calculus-based stochastic processes and their applications at an undergraduate level. After taking this course, students will gain a basic understanding of key concepts in stochastic processes, especially Markov chains.

Prerequisites

Math 230 (calculus); Stat 414 or Stat 318 (elementary probability).

Web Page

Assignments, solutions, and other materials will be posted on Canvas. Please check regularly for updates.

Required Text

Introduction to Probability Models, 11th Edition by Sheldon Ross (other editions also acceptable). Coverage: Chapters 1–6.

Grading

Component	Weight
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Homework	40%
Midterm	25% (Tentative: Thursday, Oct 16)
Final Exam	35% (TBA)

Grade Cutoffs

A	A-	B+	B	B-	C+	C	D	F
94	90	85	80	75	70	65	58	0

Academic Integrity

All students must uphold the principles of academic integrity as defined by Penn State's Code of Conduct. Acts of dishonesty, falsification, or misrepresentation are strictly prohibited.

Disability Accommodation

Students requiring accommodations should contact the Office for Disability Services (ODS) at 814-863-1807 or visit <http://equity.psu.edu/student-disability-resources/>.

Counseling and Psychological Services

For personal or psychological support, contact CAPS at 814-863-0395 or text 'LIONS' to 741741 for 24/7 crisis support.

Disclaimer

This syllabus is subject to change. Any modifications will be announced in class and on Canvas.