

Probability MA 685-2E Fall 2026

The class meets on Tue/Thu from 2:00pm to 3:15pm in Room UH 4002.

Instructor: Dr. Gunter Stolz

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Office hours: Tuesdays and Thursdays after class, either in the classroom or, after we are kicked out, in my office. Email me if you need a meeting for another time.

Textbook: The textbook required for this course is **Fundamentals of Probability with Stochastic Processes** by **Saeed Ghahramani**. I will use the 4th edition, Pearson, 2019, but you can also use another edition. There is meanwhile a 5th edition and you can also still use the 3rd edition. I have some extra copies of the 3rd edition for loan. You won't need the book that much, because all my assignments and class notes will be available on Canvas.

Learning Outcomes

Topics covered in class, in the homework, in the Midterm Exam, and the Final Exam will include

- The axioms of probability (Chapter 1)
- Combinatorial methods (Chapter 2)
- Conditional probability and independence (Chapter 3)
- Distribution functions and discrete random variables, (Chapter 4)
- Special discrete random variables (Sections 5.1, 5.2)
- Continuous random variables (Chapter 6)
- Special Continuous Distributions (Chapter 7)
- Bivariate Distributions (Chapter 8)
- Covariance and Correlation (Chapter 10)
- Moment-generating functions (Section 11.1)
- Markov and Chebyshev inequalities, Law of large numbers (Sections 11.3 and 11.4)
- Central limit theorem (Section 11.5)

- Intro to Stochastic Processes: Random walks and Markov chains (Section 12.3)

Grading policy:

Midterm Exam	40 %
Final Exam	60 %

Course Grade: Your course grade will be determined as follows:

$$A = 85 - 100, \quad B = 70 - 84, \quad C = 55 - 69, \quad F = 54 \text{ and below}$$

I will always round up.

Homework:

- Weekly homework sets will be posted as assignments in CANVAS and will usually be due within one week. They will be taken from the problem sets of the book. Answers to the homework problems, **including full solutions**, need to be turned in on the due date by 11:59pm via Canvas. Homework will be graded within one week.
- No late homework is accepted.
- Homework is **not mandatory**. It will be counted for **extra credit** as follows: Solutions to every homework assignment will be graded with 0, 0.5, 1, 1.5 or 2 points. The total points collected on homework credit will be added to the score in the next test or final exam, respectively.

Thus your homework scores are for extra credit. Nevertheless it is advised that, as a preparation for the tests, you do homework as often as possible and have it graded, even if you cannot do it regularly for credit.

Tests: The Midterm Test and the Final Exam are open notes and open book. Tests will be modeled after the homework sets. You may use a calculator, and most likely you will need one, so bring one with you. You may also use a phone, laptop or a tablet without internet connection (Wi-Fi switched off, airplane mode).

The **Midterm Exam** will be given on **Thursday, October 8** (usual classroom, usual time).

The **Final Exam** is scheduled on **Tuesday, December 8, 1:30pm to 4:00pm**. It is comprehensive, but approximately two thirds of the credit will be for material covered in the second half of the course.

Additional Remarks:

- **Regular class attendance is important and strongly encouraged.** The instructor will mostly follow the book (or parts of it), so if you have to miss a class, ask a fellow student what was covered in class and study the corresponding sections of the book carefully (or the class notes posted on Canvas).
- This syllabus, my class notes, as well as homework assignments with due dates are made available on the CANVAS page of this course (all in the 'Files' directory). It is your responsibility to regularly check for updated postings on CANVAS.
- If you would like to use another book for additional reading on top of Ghahramani, I recommend

S. Ross, *A First Course in Probability*, Prentice Hall

This book covers similar material, but is somewhat more elementary than Ghahramani.

Some important UAB policies

Non-discrimination Statement

The University of Alabama at Birmingham (UAB) is an Equal Employment/Equal Educational Opportunity Institution. UAB is dedicated to providing equal opportunities and equal access to all individuals regardless of race, color, religion, ethnic or national origin, sex (including pregnancy), genetic information, age, disability, religion, sexual orientation, gender identity, gender expression, and veterans status. Title IX of the Educational Amendments of 1972 protects individuals from discrimination based on sex in any educational program or activity operated by recipients of federal financial assistance. As required by Title IX, UAB does not discriminate based on sex in its educational programs or activities, including in admission and employment. Inquiries concerning the application of Title IX may be referred to UABs Assistant Vice President and Senior Title IX Coordinator, the U.S. Department of Educations Office for Civil Rights, or both. UABs Assistant Vice President and Senior Title IX Coordinator is Andrea McDew, 701 20th Street South, Suite 1030, Birmingham, AL 35233, 205-5493, amcdew@uab.edu. UAB does not discriminate in admissions, educational programs, or employment on the basis of any factor stated above or prohibited under applicable law. Students, faculty, and staff are assured of participation in University programs and in the use of facilities without such discrimination.

Divisive Concepts:

All University faculty, instructors and teaching staff have the academic freedom to explore, discuss, and provide instruction on a wide range of topics in an academic setting. This class may present difficult, objectionable, or controversial topics for consideration, but will do so through an objective, scholarly lens designed to encourage critical thinking. Though students may be asked to share their personal views in the academic setting, no student will ever be required to assent or agree with any concept considered divisive under Alabama law, nor penalized for refusing to support or endorse such a concept. All students are strongly encouraged to think independently and analytically about all material presented in class and may express their views in a time, place, and manner, consistent with class organization and structure, and in accordance with the Universitys commitment to free and open thought, inquiry, and expressions.

Shared Values Statement:

Collaboration, integrity, respect, and excellence are core values of our institution and affirm what it means to be a UAB community member. A key foundation of UAB is diversity. At UAB, everybody counts every day. UAB is committed to fostering a respectful, accessible and open campus environment. We value every member of our campus and the richly different perspectives, characteristics and life experiences that contribute to UABs unique environment. UAB values and cultivates access, engagement and opportunity in our research, learning, clinical, and work environments. Our College aims to create an open and welcoming environment and to support the success of all UAB community members.

Academic Misconduct:

UAB Faculty expects all members of its academic community to function according to the highest ethical and professional standards. Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, fabrication, and misrepresentation. Students are expected to honor the UAB Academic Code of Conduct as detailed in the most current UAB Policies Guide. Please consult these resources for additional information regarding the specific procedures to be undertaken when a student violates the UAB Academic Code of Conduct.

- <https://www.uab.edu/students/one-stop/policies/academic-honor-code>
- <https://www.uab.edu/engineering/home/students/code-of-conduct#academic>

DSS Accessibility Statement:

UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact DSS to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call 934-4205 or visit <http://www.uab.edu/dss> or Hill Student Center Suite 409.