

ISYE 2027 Probability with Applications - Fall 2026

Instructor information

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Course information

In this course, the students will learn the basic tools used in developing and analyzing probabilistic models with their applications.

Prerequisites Math 2550 (Introduction to Multivariable Calculus) or Math 2551 (Multivariable Calculus) with concurrency. (ISyE recommends against taking Math 2550 and ISyE 2027 with concurrency.)

Course Outcomes At the end of the course you should be able to

- Grasp which distributions might be appropriate in modeling a particular situation.
- Understand measures of a distribution's location and spread.
- Model and analyze problems at a level of the newsvendor problem or the travel time for carousels and miniloads.
- Understand the role of probability in decision making.
- Understand how randomness affects system behavior and performance.
- Compute probabilities and moments such as the expected value and variance of random variables and combinations/functions of random variables.
- Understand relationships among multiple random quantities.
- Be able to use the central limit theorem to approximate probabilities related to sums of i.i.d. random variables. Know how much probability is within 1, 2 and 3 standard deviations of the mean of a normal distribution.

Required Course Materials

Required Textbook F. M. Dekking, C. Kraaikamp, H. P. Lopuhaä, and L. E. Meester, *A Modern Introduction to Probability and Statistics: Understanding Why and How*, Springer, London, 2005.

An electronic copy of the textbook is available for free via the Georgia Tech library at library.gatech.edu.

Grading Policy

The weights used for grade assignment will be

Assignment type	Weight
Attendance and participation:	5%
Quizzes:	15%
Midterm exam 1:	20%
Midterm exam 2:	25%
Final	35%

Thresholds for letter grade assignment are as follows.

Letter grade	Percentage range
A:	$89.5\% \leq \text{total grade} \leq 100\%$
B:	$79.5\% \leq \text{total grade} < 89.5\%$
C	$69.5\% \leq \text{total grade} < 79.5\%$
D	$59.5\% \leq \text{total grade} < 69.5\%$
F	$0\% \leq \text{total grade} < 59.5\%$

Participation/Attendance In-person attendance is required, and taken using a seating chart (created from student-chosen seats). Attendance is worth 2% of the total grade. Participation is 3% of the total grade. Starting week 2, students get participation credit for asking a question or answering a question at least once every two lectures. For the first week of class, students get participation credit for making a self-introduction video for the instructor and TAs to learn your name.

Quizzes Five quizzes, worth 3% each, will be given during the semester. Quizzes are graded for correctness, with partial credit awarded for partial answers (e.g. work shown) or to account for minor errors.

Exams Two midterm exams and a final exam will be given during the semester. Exams are graded for correctness, with partial credit awarded for partial answers (e.g. work shown) or to account for minor errors.

Course policies

Attendance In-person attendance is required. Three unexcused absences are dropped. Three participation assignments are dropped. Students who miss lecture for an institute-approved reason should submit documentation to the instructor, review any posted materials from the lecture, and record a video of themselves asking a question they had when reviewing the materials or giving a brief overview of basic concepts covered, within one week of the missed lecture. This will give full credit for both attendance and participation associated with that lecture.

Student Use of Mobile Devices in the Classroom To create a space that is free from distractions and dedicated to learning, use of mobile devices (laptops, cell phones, tablets, etc.) is not allowed in the classroom, except where required for accessibility. (To use a mobile device in class for accessibility purposes, please follow the instructions in the section Accommodations for Students with Disabilities).

Quiz Corrections Quiz correction opportunities will be available on the first four quizzes. (Quiz 5 is too late in the semester to provide this.) On these four quizzes, students may receive 50% of lost points back on any incorrect question if they attend the instructor office hours and explain why their solution was incorrect and show how to correctly find the solution on the whiteboard, without aids. This should be done within one week of receiving the quiz grades. The student can talk through this with the instructor and TAs ahead of time, but the explanation and solution should be shown to the instructor at a separate office hours, to demonstrate that the student understands the mistake and how to correctly approach the problem. If the explanation and/or solution are incorrect, the student can return to another office hours on a different day within the one-week period to attempt the explanation and solution again. Quiz corrections are allowed on all questions on the first four quizzes. Thus, a student may get 50% back on one question, but not another, because one explanation was correct and another was not.

Midterm Corrections On both midterms, students may receive 10% of lost points back on any incorrect question if they attend the instructor office hours and explain why their solution was incorrect and show how to correctly find the solution on the whiteboard, without aids. This should be done within one week of receiving the test grades. The student can talk through this with the instructor and TAs ahead of time, but the explanation and solution should be shown to the instructor at a separate office hours, to demonstrate that the student understands the mistake and how to correctly approach the problem. If the explanation and/or solution are incorrect, the student can return to another instructor office hours on a different day within the one-week period to attempt the explanation and solution again. Midterm corrections are allowed on all questions on both midterms. Thus, a student may get 10% back on one question, but not another, because one explanation was correct and another was not.

Regrade Requests Request for regrade of a question on a quiz or midterm exam must be done through Gradescope within one week of receiving the grade back. Regrade requests for the final exam should be made within 2 days of receiving the exam grade. The regrade request comment should include the rubric item that was incorrectly applied. Sometimes the second look with a regrade request shows that a deduction was not taken for that student that was taken for others; this means regrade requests can result in a lower score.

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 Quizzes and exams are to be your own work. All exams are closed-book and closed-notes. Use of generative AI on quizzes and/or exams is not allowed.

Re-scheduled/missed exams Makeup quizzes and exams are only offered for institute-approved reasons. Contact the instructor within the first two weeks of the semester if dates of quizzes and/or exams conflict with a religious observance.