MATH 3235 Syllabus

Probability Theory, Section N, 3 Credits

Fall 2026

Time: TR 2-3:15PM

Location: Skiles 255

Instructor Information

Instructor: Wenjing Liao

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General Course Information

Course Description

This course is a mathematical introduction to probability theory, covering random variables, moments, multivariate distributions, law of large numbers, central limit theorem, and large deviations.

Prerequisites:

(MATH 2551 or MATH 2X51 or MATH 2561 or MATH 2401 or MATH 24X1 or MATH 2411 or MATH 2605 or MATH 2550) AND (MATH 2106 or CS 2051 or MATH 3012)

Course Objectives

Upon successful completion of the course, students should be able to

- use and recognize major named probability distributions.
- compute (conditional and unconditional) probabilities, expectations, and variances.
- apply major theorems of probability to solve certain problems.
- use probabilistic independence to solve certain problems.
- write logical progressions of precise mathematical statements to justify and communicate their reasoning.

Required Course Materials

Main textbook: Grimmett, G. and Welsh, D. Probability: An Introduction. 2nd Edition. Oxford UP. 2014. ("Grimmett & Welsh")

Other references:

- Ross, S. A First Course in Probability. Any version. Pearson. (Ross is another standard undergrad probability textbook, a little slower than Grimmett and Welsh.)
- Blitzstein, J. and Hwang, J. Introduction to Probability. 2nd Edition. Taylor & Francis. 2019. (These evolved from lecture notes from Harvard's undergrad probability course for non-majors; also slower than Grimmett & Welsh.)

Grimmett & Welsh is available for free online, with your GT login, through ProQuest. Blitzstein and Hwang is also available for free on their website. We will not use the "Other References" directly; they are just a place to start if you think, "I'm not following Grimmett & Welsh's explanation of certain topics. Is there another explanation I can read?" Blitzstein & Hwang is especially good for this.

Course websites: Canvas and Piazza

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We will use Canvas as our main course site. Please check it regularly. This course will have a Piazza forum, to facilitate discussion. You can access it by clicking the "Piazza" tab at the left side of our common Canvas site. It should ask you to register when you click the link the first time. If you have a math question, consider posting it on Piazza! If you want to sharpen your skills and help build a learning community together, consider answering your classmates' questions on Piazza! I will also monitor this and answer questions.

Grading Policy:

- Weighted average one: 20% Homework + 15% Quizzes (the lowest quiz score dropped) + 35% Midterms + 30% Final
- Weighted average two: 15% Homework (two lowest homework scores dropped) + 15% Quizzes (the lowest quiz score dropped) + 35% Midterms + 35% Final
- Weighted average three: 20% Homework + 15% Quizzes (the lowest quiz score dropped) + 20% The higher midterm score + 10% The lower midterm score + 35%*(Final)

Your course average will be the highest of the three weighted average numbers above.

Your final grade will be assigned as a letter grade (approximately) according to the following scale:

A 90-100%

B 80-89%

C 70-79%

D 60-69%

F 0-59%

At Georgia Tech, grades are awarded on a scale of A-F with no +/- grades permitted. The grading scale inserted above is a standard option,

See http://registrar.gatech.edu/info/grading-system (Links to an external site.) for more information about the grading system at Georgia Tech.

Homework:

There will be weekly homework assignments.

Quizzes:

There will be four 15-minute quizzes, administered at the beginning of certain class meetings. The lowest quiz score will be dropped.

Midterms:

There will be two 75-minute midterm exams during the regular class time on Thursday.

Final:

There will be one final exam.

CIOS Incentive:

If at least 85% of all students in this section complete CIOS evaluations before the final exam, we will drop an additional lowest homework score.

Course Policies

Attendance and/or Participation

In this class, attendance on all lectures is strongly encouraged, but attendance is not included as a component of the course grade. There will be four in-class quizzes and two in-class midterms. Absence from any quizz or midterm will result in a zero score, unless the absence is officially excused and supported by appropriate documentation.

Make-up Quizzes and Exams

Make-up quizzes and exams can be offered for excused absences. Excused absences include:

- Approved Institute activities, such as field trips, professional conferences, and athletic events: Please check the calendar and notify me in writing of all conflicts within the first two weeks of class, or as soon as possible once your absence has been approved.
- Religious holidays: Please check the calendar and notify me in writing of all conflicts within the first two weeks of class.
- Illness: Please notify me in writing as soon as possible, ideally before the quiz/exam, and be prepared to provide some form of official documentation. Of course, exceptions to "notify before" can be made for extraordinary circumstances such as emergency hospitalization or accidents.
- Disability accommodations: These accommodations are not retroactive and must be agreed upon in advance.

All make-ups must be completed before the corresponding test has been graded and returned to other students (usually within one week).

Late Homework

Late homework will not be accepted. If an extension is needed for an excused reason (e.g., disability accommodations), the request must be communicated to the instructor before the original due date.

Collaboration Policy

You are welcome to work on homework together, as long as you

1. write the name(s) of your collaborator(s) on your submission (your homework score will not be affected by this), and
2. write your homework separately. That is, you can meet classmates to discuss the ideas of a proof, and to ask for help when you get stuck, but you must understand what was discussed well enough to write it on your own solution after the group meeting, and you should only submit the work that you understand well enough that you would feel comfortable explaining it to another student.

Generative AI Tools

Generative artificial intelligence tools like ChatGPT can be helpful for building your understanding, but you should not ask them to solve homework problems.

Examples of questions you can ask:

- "Why do you multiply the probabilities for independent events?"
- "Why is conditional probability defined the way it is?"
- "How should I interpret a probability density function?"

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. Cheating includes, but is not limited to:

1. Using books, or any form of notes on tests or quizzes, unless explicitly permitted.
2. Copying directly from any source, including friends, classmates, tutors, internet sources, or a solutions manual.
3. Allowing another person to copy your work.
4. Taking a test or quiz in someone else's name or having someone else take a test or quiz in your name.
5. Asking for a regrade of a paper that has been altered from its original form.
6. Communicating with another student by any means regarding an exam while the assessment is in progress or available.

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.

Georgia Tech Resources for Personal Support

The Office of the Dean of Students: 404-894-6367; Smithgall Student Services Building 2nd floor. You also may request assistance here.

Counseling Center: 404-894-2575; Smithgall Student Services Building 2nd floor Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources. Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.

Students' Temporary Assistance and Resources (STAR) Can assist with interview clothing, food, and housing needs.

Stamps Health Services: 404-894-1420; Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition.

OMED: Educational Services

Women's Resource Center: 404-385-0230

LGBTQIA Resource Center: 404-385-2679

Veteran's Resource Center: 404-385-2067

Georgia Tech Police: 404-894-2500