Syllabus

ISyE 2027, Probability with Applications, Sections M09 and M12
Spring 2027

Catalog Description Topics include conditional probability, density and distribution functions from engineering, expectation, conditional expectation, laws of large numbers, central limit theorem, and introduction to Poisson Processes.

Course Objectives

1. Introduction
2. Outcomes, Events, and Probability
3. Conditional Probability and Independence
4. Counting Techniques for Probability
5. Discrete Random Variables
6. Continuous Random Variables
7. Expected Values (includes moment generating functions)
8. Multiple Random Variables (includes conditional distributions)
9. Covariance and Correlation (includes conditional expectations)
10. Functions of Multiple Random Variables
11. Limit Theorems

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`.

Final Grade

Midterm 1	25%
Midterm 2	25%
Final Exam	35%
Assignments	10%
Unannounced Quizzes	5%

To be certain of receiving a final grade of A, B, C, or D for the course, your cumulative score needs to be above 90.00, 80.00, 70.00, or 60.00, respectively.

If the course is taken on a pass/fail basis, then the final grade will be either S (if your standing is in the C range or higher) or U (if your standing is in the D range or lower).

Class Attendance

This is a residential class. All lectures will be delivered in the classroom. *Class attendance is mandatory*.

The use of electronic devices (including laptops and phones) is prohibited in class. *Tablets may only be used for taking lecture notes*.

All examinations will be administered in class and must be taken in person.

Midterm examinations will only be rescheduled for individual students when required by Georgia Tech. Please refer to `catalog.gatech.edu/rules/4` for Institute policies regarding absences. Institute policies regarding final examinations are provided at `registrar.gatech.edu/info/exam-guidelines`.

When Georgia Tech policy does not apply, special arrangements for a missed examination will only be made at the discretion of the Instructor. Special arrangements for a missed midterm examination involve placing additional weight on the final examination to compensate.

Honor Code

Students in this class are expected to abide by the Georgia Tech Honor Code and avoid any instances of academic misconduct, including but not limited to: (i) possessing, using, or exchanging improperly acquired written or verbal information in the preparation of homework or for examinations, (ii) substitution for, or unauthorized collaboration with, a student in the commission of academic requirements, and (iii) submission of material that is wholly or substantially identical to that created or published by other persons or entities (including AI tools). The complete text of the Honor Code may be found at `osi.gatech.edu`.

Expectations

This course will operate according to the student-faculty expectations available at `catalog.gatech.edu/rules/22`. A homework assignment will be due on the final instructional class days, see `catalog.gatech.edu/rules/12`.

Disability Services

If you are a student with learning needs that require special accommodations, please contact the Office of Disability Services at 404-894-2563 or `disabilityservices.gatech.edu` to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also contact the Instructor to set up a time to review your accommodations and discuss your learning needs. Students with testing accommodations should schedule all exams with the Disability Services Testing Center.