

[MATH 3670 Syllabus] Syllabus

[Probability and Statistics Section L, 3 credits]

[Fall 2026]

## Instructor Information

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**Instructor:** Rachel Kuske

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## General Course Information

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### Description

[Introduction to probability, statistical quantities, probability distributions, point estimation, confidence intervals, hypothesis testing, linear regression.]

### Course Learning Outcomes

Students will be able to demonstrate a mathematical understanding of key concepts in the following areas, and to apply these concepts on concrete questions of probability in these areas. They will learn appropriate mathematical notation, be able to translate probability questions into this mathematical notation, and use mathematical and computational methods to provide quantitative answers.

**Probability of events:** Random experiments, events, sets, and probabilities; Probabilities for equally likely outcomes, elementary counting; Independent events; Conditional probability, Bayes theorem.

**Random Variables and Their Distributions:** Discrete random variables: Binomial, geometric, Poisson. Continuous random variables: Exponential, normal, uniform; Poisson process, waiting times.

**Expected Values and Functions of Random Variables:** Expectations and variances of standard random variables. Expectations of functions of random variables; Chi-square as the square of a normal, sums of independent random variables and properties of standard distributions; Central limit theorem

**Descriptive Statistics:** Random samples: data collection and presentation Sample statistics: mean, median, quantiles

**Statistical Estimation:** Point estimates and their properties Probability distributions for estimator, the t and F distributions; Confidence intervals

**Hypothesis Testing:** Single sample tests, means, variances; Comparison of two populations, means and variances; Testing for a distribution, testing for independence.

**Linear Regression and Correlation:** Fitting a regression line; Inferences on the regression; Predictions for future responses; Analysis of variance, Experimental design.

### Required Course Materials

Title: Introduction to Probability and Statistics for Engineers and Scientists Author: Sheldon Ross. Editor: academic Press. The 6<sup>th</sup> edition. (available online through GT Library)

### Grading Policy:

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

- A 90-100%
- B 80-89%
- C 70-79%
- D 60-69%
- F 0-59%

According to GT policy, grades at Georgia Tech are interpreted as follows:

- A Excellent (4 quality points per credit hour)
- B Good (3 quality points per credit hour)
- C Satisfactory (2 quality points per credit hour)
- D Passing (1 quality point per credit hour)
- F Failure (0 quality points per credit hour)

### Assignments

#### Description of Graded Components

Component	Format	Percentage of Total Grade	Comments
Online Reading quizzes	Taken through Gradescope, due before lecture begins	10%, average of all reading/video quiz grades with lowest two grades dropped	No re-takes or make-ups – 7 of these

<b>In Class Short Quizzes (5)</b>	Taken in class, submit through Gradescope.	30%, average of all quiz grades, with lowest two quiz grades dropped	No re-takes or make-up quizzes: 6 of these
<b>Review quizzes (2)</b>	Taken in class, handed in via Gradescope	30% (each Review Quiz 15%)	Based on previous quizzes and homework: 2 of these
<b>Project: Parts I, II, III</b>	Handed in via TurnItIn and in Gradescope	5% Part I. 5% Part II. 5% Part II.	Guidelines provided in Canvas Files
<b>Project: Part IV</b>	Due during exam week	15%	Guidelines provided in late March

## Course Policies

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### Attendance and/or Participation

All in class and review quizzes must be taken in class.

### 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.

### Additional Georgia Tech Required Policies [Remove this heading in your final syllabus]

#### 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.

