

Math 3670

Probability and Statistics with Applications

Spring 2025

Catalog Description

Introduction to probability, probability distributions, point estimation, confidence intervals, hypothesis testing, linear regression and analysis of variance.

Prerequisites

MATH 2401 or MATH 24X1 or MATH 2411 or MATH 2551 or MATH 2550 or MATH 2X51.

Textbook

Title: Introduction to Probability and Statistics for Engineers and Scientists

Author: Sheldon Ross. Editor: academic Press. Edition: 6th edition

The book is available for free to Georgia students. The link for the 6th edition is:

<https://www.sciencedirect.com/book/9780128243466/introduction-to-probability-and-statistics-for-engineers-and-scientists>.

Instructor

Dr. Alexandre Locquet, office 206.

Communication: Please send me messages using Canvas only. (“Inbox” tab on your dashboard).

Please do not use email.

Lecture Times

TBD

Office hours

TBD

Grading Policy

Homework	14%
Quiz 1	28%
Quiz 2	28%
Final Exam	30%

Important Dates

Quiz 1	TBD
Quiz 2	TBD
Final Exam	TBD

Quizzes and Final Exam

The quizzes and the final exam will be in-person, closed-book and notes. The final exam will be comprehensive (cumulative). The use of a calculator will be allowed. Any request for regrading a quiz must be made to the instructor within one week of getting the quiz back. If you have an acceptable reason for missing Quiz 1 or Quiz 2, the weight associated to the quiz will be transferred to the final exam. If you are unsatisfied with your performance on Quiz1 or Quiz2, you may request in writing, within one week of getting the quiz back, that the weight of ONE of the two quizzes be transferred to the final exam. This choice of transferring the weight to the final exam is irreversible. If you do not take a quiz and do not have an acceptable reason for missing it, your score on that quiz will be zero, with no option for transferring the weight to the final.

If the sanitary situation requires it, the quizzes and final might be administered online at some point during the term. You can use [this](#) formula sheet for the quizzes and final.

Homework

7 problems sets will be assigned. **Homework should be submitted electronically on Canvas as a single, legible, pdf file.** The submission time on Canvas will be used to determine whether a homework is submitted on time or not: no exceptions will be made. A completion grade will be assigned. If a given homework 1) has been submitted on time and 2) every problem is answered, the student gets 2% credit. **If one of the conditions above is not satisfied, 1% credit will be assigned. If none of the conditions are satisfied, 0% credit will be assigned. If a homework is submitted more than 2 days late, 0% credit will be assigned, even if every problem is answered.** Late homework submission can only be excused by Dr. Voss, Dean of Students representative: please contact him and ask that he informs me of his decision to excuse or not excuse you late submission.

Attendance

A 1% BONUS is associated to attendance. Attendance Polling using Turning Point Technology and/or attendance sheets will be used to count the number of absences.

Students need to install the TurningPoint app on a mobile device. As a Georgia Tech student, installation and use of the app is free. In the TurningPoint settings, the region needs to be set to “North/South America” and NOT to Europe.

Students who do not miss more than 2 lectures during the entire term get a 1% attendance BONUS. Students who miss more than 2 classes get 0% for the attendance BONUS.

In-Lecture Polling

Students will be asked to answer questions during some lectures, using the Turning Point app. Students who will have correctly answered at least 80% **of all questions asked during the term** get a 2% BONUS. Students who have answered correctly more than 60% of all questions correctly get 1% BONUS for the “In-lecture polling bonus”. Students who answer correctly less than 60% of all questions get 0% for the “In-lecture polling bonus”. If you do not answer a question, for any reason including absence, your answer will be considered as incorrect for the determination of the attendance bonus. Session ID is gt157160.

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. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation 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.

Honor Code

Students are, of course, expected to abide by the [Georgia Tech Honor Code](#). Instances of academic misconduct will be viewed very seriously and reported to the Dean of Students.

CIOS

You are also encouraged to fill out the course-instructor opinion survey (CIOS). If 100% of the students fill out the survey, the entire class will benefit from a 0.5% bonus.

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- 1.1 Origin of uncertainty
- 1.2 Probability versus Statistics

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I.4. Axiomatic Definition of Probability

- 4.1 A Special Case: the Simple Sample Space

I.5. Conditional Probability

- 5.1 Probability of Event Intersections
- 5.2 Independence of Events

I.6. Bayes' Theorem

I.7. Counting Techniques

- 7.1 Permutations
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II. Random Variables

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II.2 The Probability Mass Function of Discrete RVs function *Text: 4.1,4.2*

II.3 The Cumulative Distribution Function *Text:4.1, 4.2*

II.4 The Probability Density Function of Continuous Random Variables *Text: 4.1,4.2*

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- 5.1 Expectation
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4.4 Confidence Interval for the mean of a normal population of unknown variance *Textbook: 7.3.1*

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- 5.1 Introduction *Textbook: 8.1, 8.2*
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- 5.7 Hypothesis tests on the difference between two normal means – variances unknown and different *Textbook: 8.4.3*
- 5.8 Hypothesis tests on the variances of two normal populations *Textbook: 8.5.1*