ISYE 3770 Syllabus - Fall 2026

Statistics and Applications, 3 credits, T14

Tuesdays and Thursdays, 2:00 to 3:15 PM

George Tower, Room 350

Instructor	Email
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Teaching Assistant(s)	Email	Drop-in Hours

General Course Information

Catalog Description

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

Description

This course provides essential statistical tools for making informed decisions under uncertainty. Topics include probability, probability distributions, point estimation, confidence intervals, hypothesis testing, linear regression, and analysis of variance. The course emphasizes practical application through real-world examples from manufacturing, healthcare, and technology. Students learn to collect data, quantify uncertainty, distinguish real effects from random variation, and build predictive models, developing the statistical thinking and data analysis skills necessary for effective problem-solving and decision-making.

Prerequisites and/or Corequisites

MATH 2551 or MATH 2550 AND MATH 1554 or MATH 1553

Course Goals and Learning Outcomes

Statistical methods enable professionals to make reliable decisions based on data despite inherent variability in systems and measurements. This course equips students with both the conceptual understanding and practical skills needed to analyze data, quantify uncertainty, and approach problems using statistical thinking.

Upon successful completion of this course, students will be able to:

- Design data collection strategies and create effective visual representations of data
- Apply probability concepts to quantify uncertainty and model random phenomena in complex systems
- Conduct hypothesis tests and construct confidence intervals for informed decision-making
- Select appropriate statistical methods based on data type
- Build and interpret regression models for prediction and process optimization
- Use statistical software to analyze data and interpret results
- Draw sound conclusions from experiments while understanding underlying assumptions and limitations
- Communicate statistical findings effectively to diverse audiences

Course Requirements & Grading

Graded Component	Weight
Individual Homework Assignments (1-8)	10%
Midterm Exam #1	25%
Midterm Exam #2	30%
Final Exam	30%
Quizzes	5%

Extra Credit Opportunities

Limited extra credit opportunities may be offered throughout the semester through in-class activities, such as brief problem-solving exercises, participation activities, or review sessions. These opportunities are intended to reinforce course concepts and support exam preparation.

Some extra credit opportunities may only be available during class and may not be reproducible or offered as make-up opportunities outside of class. Students are responsible for staying informed about these opportunities and obtaining any missed course material if they are absent.

Students may earn up to 2 percentage points of extra credit toward their final course grade over the course of the semester.

Grading Scale

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

A	>=90%
B	80.0-89.99%
C	70.0-79.99%
D	60.0-69.99%
F	0-59.99%

According to 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)

See http://registrar.gatech.edu/info/grading-system for more information about the grading system at Georgia Tech.

Description of Graded Components

Homework Assignments

- Homework assignments are designed to reinforce the statistical methods covered in class through conceptual questions, calculations, data analysis, interpretation, and applied problem-solving. Some assignments will require the use of statistical software (e.g., R, Python, Excel, or Minitab), while others will focus on analytical reasoning without software. Assignments correspond to material covered in class and are due as indicated in the Course Schedule on Canvas.
- There will be **eight (8) homework assignments**, typically consisting of up to 10 exercises. A subset of questions, selected in advance by the instructional team, will be graded for each assignment. Students are expected to complete all assigned problems and show their work, justify their answers when appropriate, interpret results in context, and communicate findings clearly using appropriate statistical terminology.
- Homework must be submitted as a single PDF through Canvas. Submissions may be prepared electronically or handwritten, but all work must be complete, legible, and properly formatted. Students are responsible for verifying that all pages are included and readable and that no content is cut off or corrupted. Missing, illegible, or corrupted content will not be considered during grading. If software is used, the corresponding code or Excel files must also be submitted as instructed.
- Homework is graded based on correctness, completeness, clarity of reasoning and presentation, appropriate interpretation of results, and proper use of statistical methods and software.
- No late homework will be accepted**.**
- You may discuss homework assignments with the instructor, TAs, classmates, and others; however, solutions to individual homework assignments must be written independently.

Midterm and Final Exams

- Midterm and final exams assess students' mastery of statistical concepts, problem-solving abilities, and ability to apply statistical methods to new situations. Exams evaluate understanding of fundamental principles, computational proficiency, interpretation skills, and statistical reasoning developed throughout the course.
- The course includes **two in-person midterm exams and one in-person final exam**, administered during scheduled class times. All exams are cumulative and cover material from the beginning of the semester through the exam date, as statistical concepts build progressively throughout the course.
- Students may bring reference sheets (8.5" × 11", both sides) containing formulas, notes, or examples, as follows:
    - One reference sheet for Midterm Exam #1
    - Two reference sheets for Midterm Exam #2
    - Three reference sheets for the Final Exam
- Exams are closed book, with the exception of the permitted reference sheets described above. Statistical tables and charts will be provided by the instructor when needed. Exam questions will primarily reflect concepts, methods, and problem types covered in homework assignments and lecture material. Only scientific calculators are permitted. Graphing calculators, calculators with Computer Algebra Systems (CAS), internet or wireless connectivity, AI-enabled features, or the ability to store or display notes or

documents are not allowed. Exam details, including format and emphasized topics, will be announced via Canvas approximately one week before each exam.

- ***Makeup Policy:*** Makeup exams are permitted only in cases of (i) serious illness with appropriate documentation, (ii) Institute-approved absences, (iii) absences recommended by the Dean's Office, or (iv) Georgia Tech Athletic Association conflicts with appropriate documentation. Students who qualify for a makeup exam must notify the instructor and provide documentation as soon as possible.
- ***Re-grade Policy:*** Re-grade requests are governed by the course Re-grade Requests policy below.

Midterm Exams

- Midterm #1: 10/01 (in class)
- Midterm #2: 11/12 (in class)

Final Exam

The final exam date and time are determined according to the Georgia Tech Fall 2026 Final Exam Matrix.

- T14: Thursday, December 10, 2026, 2:40–5:30pm ET

Quizzes

- After each lecture that covers new content, a short quiz will be posted on Canvas. You have until midnight the day after the lecture to complete the quiz.
- The lowest 2 quizzes will be dropped.

Course Materials

Course Text

Main Text: Montgomery, D.C. & Runger, G.C. *Applied Statistics and Probability for Engineers*, 6th or 7th Edition, Hoboken, NJ: Wiley.

Additional Optional Reference: Devore, J.L. (2016). *Probability and Statistics for Engineering and the Sciences*, 9th Edition, Boston, MA: Cengage Learning.

Books for this course are available through the Georgia Tech Library. All other course materials, including slides and homework assignments, will be available on Canvas.

Course Website and Other Classroom Management Tools

Canvas is the means to disseminate course information, provide resources, and submit assignments. Students are expected to check Canvas regularly.

Course Expectations & Guidelines

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. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, which 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 at (404)894-2563 or http://disabilityservices.gatech.edu/, 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.

Attendance and Participation

Class attendance is expected. Regular attendance supports learning by providing opportunities to reinforce course concepts through additional examples, explanations, problem-solving activities, and discussion. Consistent participation can strengthen students' understanding of the material and preparation for assignments and exams.

Lectures will not be recorded, and students are responsible for obtaining any missed material, announcements, or notes if they are absent. Some in-class activities may offer small amounts of credit or provide guidance that is valuable for course assignments and exams.

All students are expected to conduct themselves professionally and contribute to a respectful and productive learning environment.

Collaboration, Group Work, and Acceptable Resources

Homework assignments are designed to develop your ability to understand, formulate, and solve problems. You may collaborate with others when discussing concepts, approaches, and strategies for solving homework problems. However, you must independently prepare your own solutions, perform your own calculations and analyses, and submit your own written work. Copying, closely rephrasing, or otherwise reproducing another person's work is not permitted.

You may use course materials listed in the syllabus when completing homework assignments. If you use outside resources, you must appropriately cite them.

Collaboration is **not permitted on midterm or final exams**. Any unauthorized collaboration on exams constitutes a violation of the Georgia Tech Honor Code.

Use of Artificial Intelligence

Generative AI tools (e.g., ChatGPT, Claude, Gemini, Copilot) may be used to support learning in this course. Appropriate uses include obtaining explanations of concepts, generating additional practice problems, debugging code, checking calculations, and exploring alternative solution approaches.

Students are responsible for verifying the accuracy of AI-generated content and for ensuring that they understand all work they submit.

Homework assignments, quizzes, and in-class assignments are intended primarily as opportunities for practice and learning. Students may use AI tools on these assignments unless otherwise specified by the instructor.

Midterm and final examinations are intended to assess individual mastery of the course material. **The use of AI tools or other unauthorized resources during examinations is prohibited.**

Students should be aware that excessive reliance on AI tools may hinder the development of the problem-solving and statistical reasoning skills needed for success on examinations and in professional practice.

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 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.

Student Use of Mobile Devices in the Classroom

Research on learning shows that unexpected noises, movement, and off-task device use can distract both the user and others in the classroom.

Laptops and tablets may be used during class for course-related purposes only, such as taking notes, accessing course materials, or participating in class activities. Students are encouraged to be mindful of how device use may affect their own learning and that of others.

Cell phones should be silenced and stored during class unless their use is requested for a course-related activity. All devices should be used in a manner that supports, rather than distracts from, the learning environment.

Re-grade Policy

If you believe there has been an error in the grading of an assignment or exam, you must submit a re-grade request within **7 days** of the date the graded work is returned to the class**.** Re-grade requests must include a written explanation identifying the specific grading error.

A re-grade request may result in the entire assignment or exam being re-evaluated**.** As a result, the final score may increase, decrease, or remain unchanged.

Campus Resources for Students

Some campus resources that may be relevant to support your learning process:

- Georgia Tech Library https://library.gatech.edu/
- Communication Center https://communicationcenter.gatech.edu/
- Tutoring and Academic Services https://tutoring.gatech.edu/
- Center for Mental Health Care & Resources https://mentalhealth.gatech.edu/
- Division of Student Life https://studentlife.gatech.edu/

A complete list of resources for undergraduate students' academic success and information about advising can be found at Success at Tech. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

Student Well-being

At Georgia Tech, we are committed to your overall physical, social, and mental well-being. A comprehensive list of wellness-related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu). Additional resources on supporting student well-being, beyond the syllabus, are available through the Learning Well Initiative.