

ISyE 3770: Statistics & Applications

Instructor: Yan Li (E-mail: yli939@gatech.edu)

Instructor Office Hours:

- 5:00 pm - 6:00 pm, Tuesday & Thursday (i.e., after lectures), or by email appointment
- ISyE Main 436.

Lecture Time: 3:30 pm - 4:45 pm, Tuesday & Thursday

Lecture Location: Ford Environmental Sci & Tech L1205

Teaching Assistant & Office Hours:

- Stuart Kernohan (skernohan3@gatech.edu)
- Time: 6:45 pm - 7:45 pm, Monday
- Location: ISyE Studio (First floor, ISyE Main Building)

Textbook:

- Applied Statistics and Probability for Engineers, 7th Edition, by Montgomery & Runger

Class Notes: An electronic lecture note will be uploaded to Canvas before each lecture. We will work through the exercises inside the lecture note together during the lectures. After the lecture, a complete version of lecture note (including the solutions of exercises therein) will be released.

Catalog Description:

Introduction to probability, probability distributions, point estimation, confidence intervals, hypothesis testing, linear regression.

Course Objective:

The objective of this course is to provide an introduction to probability and statistics, emphasizing applications in science and engineering. We will be covering material contained in Chapters 2 through 11 in the text, and mostly in that order. We do not necessarily cover everything in the chapters, however. We will make it clear which material is not being covered during lectures.

Outcome:

At the end of this course, we hope to help you build the following skills.

- Ability to collect, organize, summarize and present data graphically
- Demonstrate ability to use formal mathematical argument with basic probability concepts, including conditional probability distributions
- Understand how to characterize and assess probability in its role in experiments
- Use statistical tests and confidence intervals to assess mathematical uncertainty in statistical decisions
- Select proper statistical techniques for statistical decision making based on the type of data available
- Use statistical software to conduct data analyses and interpret output
- Draw sound statistical conclusions from experiments and observational studies

Pre-requisites:

MATH 2401 or 2411 or 24X1 (Calculus III), CS 1316 or equivalent.

Software: A statistical software, **R**, will be used in this class for part of lectures and assignment. **R** is an open source software package widely used in the academia and industry. It is free, flexible, and very powerful.

Grading Policy:

Final grades consists of the following:

- Midterm – 30 points
Materials covered for the midterm: Chapter 2 - Chapter 6 (tentative).
- Final Exam – 40 points
Materials covered for the final: Chapter 7 - Chapter 11.
- Attendance – 5 points
There will be 30 lectures in total.
We will assign 5 random attendance sheets.
- Homework – 25 points
(Approximately) weekly homework (at most 10 assignments in total).
You will get at least 1 week to solve the assignment after it is released. Due date for each assignment will be released together with the homework.
- Additional Bonus – up to 20 points
These will be given in the form of bonus questions in the homework and the exam. The value of each question will be stated explicitly. For instance, “By completing this bonus question, you will earn 1 bonus point toward your total grade”. *Note that if you will have earned more than 20 bonus points during the semester, the total bonus will still be 20 points.*

In summary, the total raw grade is:

$$\begin{aligned} \text{Final grade} = & \text{Midterm grade} \cdot 0.3 + \text{Final grade} \cdot 0.4 + \text{Attendance} \cdot 0.05 + \text{Homework} \cdot 0.25 \\ & + \min \{ \text{Bonus points}, 20 \} . \end{aligned}$$

The maximum of final grade will be 120, with 100 from midterm, final, attendance, and homework, and the other 20 from bonus.

Letter Grade Minimum Averages Required (Tentative): A: 90; B: 80; C: 70; D: 60; F: <60.

I reserve the right to adjust the Minimum Average to avoid certain extreme cases.

Details on Homework: It is allowed to work together on homework assignments, but your handed-in solutions should be personal and show individual effort (not identical to the others’ assignments nor the previous solutions). For the regular assignments, *please upload an electronic pdf for your solution*, you can also scan it and upload the scanned pdf. *We allow a grace period of 24 hours*, so that you can submit the late homework within 24 hours after the due date. The late penalty will be 20% of the homework grade. In addition, we encourage students to type homework with MS Word or LaTeX but it’s not required.

Details on Exam: Exams are close book but a formula sheet will be provided by the instructor. Most exam questions will be based on Homework and Lecture Notes. Each student is only allowed to bring a calculator to the exam. No other electronic device is allowed in the test. Make-up exams are not permitted except in cases of serious illness, Institute Approved absences, Dean’s office recommended absences, or GT Athletic Association conflicts with appropriate documentations.

Grade Check: All course materials and grades will be posted on Canvas. You’re responsible to check if your posted grades are correct. *You have one week from the day we return homework or exams in class for considering re-grading.* We reserve the right to re-grade the entire homework or exam. So keep in mind, you may lose more points than you gain when we re-grade your homework or exam. Please let us know any special situation you may have during the semester in the first two weeks of the class.

GT Honor Code: Make sure that you are aware of the Honor Code by visiting <http://osi.gatech.edu/content/honor-code>. Any violation of the Honor Code (e.g., cheating in assignments or tests, not being truthful, plagiarism, etc.) may result in an automatic F in this class. Also, the student government and

faculty representatives have developed a new Student-Faculty Expectations document. Please see the page: <http://www.catalog.gatech.edu/rules/22/>.

Special Needs: Georgia Tech provides upon request appropriate academic accommodations for students with disabilities. <http://disabilityservices.gatech.edu>.

Tentative Schedule:

Time	Course Schedule or Important Info	
Jan 10	Intro & Chap 2	
Jan 12	Chap 2	Hw1
Jan 17	Chap 2	
Jan 19	Chap 3	
Jan 24	Chap 3	Hw2
Jan 26	Chap 3	
Jan 31	Chap 4	
Feb 2	Chap 4	Hw3
Feb 7	Chap 4	
Feb 9	Chap 5	
Feb 14	Chap 5	Hw4
Feb 16	Chap 5	
Feb 21	Chap 6	Hw5
Feb 23	Chap 6	
Feb 28	Chap 7	
Mar 2	Chap 7	Hw6
Mar 7	Chap 7	
Mar 9	Mitderm 1: covers material from Chap 2 to Chap 6	
Mar 14	Chap 8	
Mar 15	Withdraw deadline / Grademode change deadline	
Mar 16	Chap 8	Hw7
Mar 21	No class - Spring break	
Mar 23	No class - Spring break	
Mar 28	Chap 8	
Mar 30	Chap 9	
Apr 4	Chap 9	Hw8
Apr 6	Chap 9	
Apr 11	Chap 10	Hw9
Apr 13	Chap 10	
Apr 18	Chap 11	Hw10
Apr 20	Chap 11	
Apr 27	Final exam, 2:40 PM - 5:30 PM, class location	

Note the above HW dates are released date, not the due date. You can also find the schedule (up-to-date version) at Canvas.