CEE 6601 Syllabus

Statistics in Transportation, 4 credit hours (3 credit hours lecture, 1 credit hour unsupervised lab)

Fall 2026

Instructor Information

Instructor: Patricia Mokhtarian

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General Course Information

Description

This course is intended to (1) equip MS and PhD students with some standard tools of statistical analysis; and (2) provide liberal doses of the practical application advice that is often lacking in methods-oriented courses. It is expected to be useful not only for those who plan to use such tools in their research (i.e. "producers" of statistics), but also for anyone who wants to be an intelligent "consumer" of statistics encountered in their professional and everyday lives.

Course Learning Outcomes

Upon successful completion of this course, you should be able to:

- perform standard statistical hypothesis tests in a thoughtful rather than mechanical manner, avoiding common misunderstandings about hypothesis testing;
- appropriately specify, estimate, interpret, and critique regression models;
- understand Poisson and exponential distributions and apply them to real-world-based problems;
- understand and critically evaluate the difference between correlation and causality in application contexts; and
- recognize and understand how to deal with other common statistical application pitfalls, paradoxes, and anomalies, such as confusion of the inverse, the "flaw of averages", and Simpson's Paradox and other association reversal phenomena.

Required Course Materials

The lecture notes, and other readings as assigned.

Grading Policy:

Seven homework assignments will each count 12% of the final grade, and the final exam will account for the final 16%. Final letter grades will be assigned on the usual 90-100 = A, 80-89.99 = B, etc. basis, except for possibly dropping the cutoff points by a small amount to allow for year-to-year variations in assignment difficulty and grader style.

Description of Graded Components

Homework assignments will be distributed approximately every two weeks throughout the semester. Homework will collectively include problems that can be completed manually (or with minimal assistance from a calculator or spreadsheet), and those that are best completed with a statistical analysis package such as R, SPSS, STATA, or SAS. HWs will be distributed partly "in advance" and partly "in arrears". That is, some of each assignment may deal with material already covered by the time it is distributed (the "arrears" part), while some may deal with material yet to be covered (the "advance" part). To ensure that you have enough time to complete the assignment, it is advisable to try to do as much as possible after each lecture, instead of waiting until all topics are covered before starting.

The final exam is comprehensive, and will only involve problems that can be completed manually (or with minimal assistance from a calculator or spreadsheet).

Course Policies

Attendance and/or Participation

Although it is in your best interests to attend class, and it will make the class more interesting to you and your fellow students if you actively participate in class, neither class attendance nor active participation will directly contribute to your grade.

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 an assignment or the final exam will be reported to the Office of Student Integrity, who will investigate the incident and identify an appropriate penalty for violations.

The use of any previous homework or exam solutions from this course, or any other course I teach or have taught, is prohibited. Using such materials will be considered a direct violation of the Academic Honor Code, and will be reported to the Office of Student Integrity. Using any

other humans or artificial intelligence programs to produce solutions for you is also a violation. Similarly, redistributing your graded assignments or posted solutions from this semester to individuals or groups (e.g., contributing to online HW/test banks) is also prohibited.

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.

Pre- &/or Co-Requisites

Students are expected to have familiarity with differential and integral calculus, introductory probability & statistics (taught at the calculus level), and linear algebra. Self-paced handouts containing brief reviews of probability, statistics, and linear algebra basics are provided; since it is assumed that students already know these concepts they will not (for the most part) be covered in lectures.

Collaboration, Group Work, and Use of Generative AI

It is permissible to discuss homework assignments with classmates, but each assignment must be completed individually, without copying or making trivial changes to another person's solution.

While it is permissible to use artificial intelligence tools to learn more about the topics covered in this class, it is NOT permissible to use any such tools to find answers to homework problems or answers to superficial variations on homework problems. Use of such tools for that purpose will constitute cheating.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

NO late HWs are accepted. Since I post the solutions to the HW assignments shortly after the deadline, allowing a make-up assignment requires preparation of an entirely new assignment, which is quite a burden on both the TAs and myself. Therefore, extremely extenuating (and

documented) circumstances are required for me to approve a make-up assignment. In any case, you must request a make-up before the next assignment is due; otherwise the grade for the missed assignment becomes a permanent zero.

Campus Resources for Students

Graduate Student Academic and Professional Success Resources:

A list of resources for graduate students is given on the Office of Graduate and Postdoctoral Education website. Specific information for current graduate students includes

- Academic Resources such as the Communications Center, Language Institute, Library, Catalog, Registrar, resources for conducting research, Advocacy and Conflict Resolution resources, and how to manage unexpected situations that may impact your academic performance;
- Student Resources such as Campus Services, Child Care/Family programs, Health & Wellness, Career Services, and the Student Resource Guide; and
- *Professional Development such as the programming from the Career Center and other professional development resources and events"*

Student Well-Being:

At Georgia Tech, we are concerned about 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)