PUBP 8200 Syllabus

Advanced Research Methods I, JR, 3 Credits

Fall 2026

Instructor Information

Instructor: Juan D. Rogers

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General Course Information

Description

This course addresses:
(1) Multivariate data collection, production, description, management and presentation for public policy.
(2) Multivariate probability distributions.
(3) Inferential statistics with multivariate data sets.
(4) Graphical methods for multivariate data analysis.
(5) Computer applications with the statistical language “R”.
(6) Use of the above techniques to extract information from a data set.

Course Learning Outcomes

Familiarity with the concepts and terminology of multivariate probability and statistics.

Critical data management discipline.

Development of statistical skills for describing and analyzing multivariate policy data sets.

Ability to program basic analysis procedures in the statistical language R.

Understanding the fundamental limitations of statistical analyses.

Practice describing and analyzing patterns in multivariate policy data.

Ability to interpret and critique policy and general social science data analyses based on multivariate data sets.

Required Course Materials

Applied Multivariate Statistical Analysis (Sixth Edition) by Richard A. Johnson and Dean W. Wichern, Prentice Hall, 2007 (ISBN: 978-0134995397) (Available online in pdf format from several sources).

Grading Policy:

Homework (10 sets at 4.5 points each): 45%

Mid-Term Exam (take home): 25%

Paper project option (in lieu of final exam): 30%

Final Exam option (take home): 30%

Description of Graded Components

Homework:
Ten sets of problems to be completed individually and submitted on the Canvas site for the course. The problems will be applications of the methods developed in the week in which they are assigned.

Mid Term:
The mid-term exam will be delivered online on the date indicated in the syllabus. It will be a take-home exam to be submitted online to the Canvas site for the course within 48 hours of the starting time.

Paper Project Option:
Students who select this option must select a data set (or data sets) of their interest and write a paper that draws conclusions from their analysis using at least the following set of approaches: a Multivariate Difference of Means, a Linear Regression, and a choice of Factor Analysis, Canonical Correlation, Classification, or Clustering).
The paper should be structured as a report on the analysis of the selected data set. In that vein, it should have an introduction that states the problem or theme that the data set is believed to address or illuminate.

Final Exam:
The final exam for those students who indicated this option will be delivered online on the date indicated in the syllabus. It will be a take-home exam to be submitted online within 48 hours of the starting time.

Course Policies

Attendance and/or Participation

The course will be taught in a combination of problem-based learning and workshop format. This means that the class sessions will be in an active learning mode. Each class consists of two sessions of 1 hour and 15 minutes each with a 15-minute break in between. The first session will address the topic of the week which students will have prepared for ahead of time. It will highlight the key concepts and techniques, and address clarification questions based on student prior preparation. The second session will consist of work on actual problems. One problem will be assigned to be completed during that period, which will be uploaded at the end of the session to the course Canvas site as partial assignment completion. Therefore, class attendance is mandatory since missing class will mean missing the in-class assignment, which is graded.

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.

Core IMPACTS

Not applicable.

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

Since this is a graduate level methods class and not an introductory course, it is expected that students will have taken at least an undergraduate level statistical methods course.

Extra Credit Opportunities

A second chance will be afforded to resubmit homework that was not correct the first time. The new submission, if correct, will receive half the points of the original value. The midterm and final exams will contain extra credit items beyond the problems needed to obtain full credit.

Collaboration, Group Work, and Use of Generative AI

All course graded components are individual assignments. However, students are free to form study groups, share ideas, discuss, or help each other but must submit own personal work, the product of own writing and computer code and results.
There are many AI systems (e.g., ChatGPT) available to assist you. While they are valuable in their own ways, we believe that such tools, if not used properly, may be an obstacle in achieving the learning goals of the course. By enrolling in this class, your analytical skills will be developed over the course by thinking about and working out problems on your own or with your classmates and in groups. Copying and pasting AI produced material into course assignments is considered cheating. The use of computer code produced by AI is NOT allowed. You must use the functions and approaches provided in class for the assignments. Any use outside of this limited permission could be considered as a major violation of the GT Honor Code.

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

Homework late submission policy: If submitted within the first 24 hours after the deadline, a 10% deduction in the achieved score will be deducted. After the first 24 hours and before 48 hours have passed, another 10% deduction will be applied. Once 48 hours have passed beyond the original deadline, no submissions will be accepted. If extenuating circumstances impede a timely submission of homework, the TA and/or the instructor must be notified with justification before the original deadline has passed.