

PUBP 3042 | PUBP 3042 HP Syllabus

Data Science for Public Policy, Sections OA and HP, 3 Credits

Fall 2026

Instructor Information

Instructor: Dr. Omar I. Asensio

Email: asensio@pubpolicy.gatech.edu

General Course Information

Description

Introduces fundamentals of data science, tools, and quantitative methodologies as well as ethical implications for public and social applications. Topics for applications vary by semester. For Fall 2026, students will engage in a semester-long data science project with the World Bank, analyzing global policy investments and structured data on health infrastructure to explore how governments can build resilient systems in the face of natural disasters, climate risks, and economic policy changes.

This course meets requirements for Georgia Tech General Education (see Core IMPACTS - Social Sciences below) and requirements for the Institute minor in Applications of Artificial Intelligence and Machine Learning. For Fall 2026, this course is cross listed with the John H. Martinson Honors Program.

Course Learning Outcomes

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

- Identify social and administrative data sources to address policy issues;
- Learn the fundamental approach for causal inference and prediction with counterfactual reasoning;
- Develop an ability to collect, pre-process, and analyze data programmatically;
- Gain experience presenting and defending data-driven research;
- Consider ethical and regulatory issues concerning the protection of human subjects and responsible data use in organizations;
- Evaluate how decisions impact the sustainability of communities.

Required Course Materials

Quantitative Social Science: An Introduction by Kosuke Imai, Princeton University Press (ISBN 9780691175461), available at Georgia Tech Barnes and Noble Bookstore and online at [QSS book website](#)

QSS Student datasets and R resources are freely available at [Princeton University Press student resources](#)

Grading Policy

Your final will be determined as follows:

Assignment	Points	Weight
Quiz	10	10%
Problem Set 1	20	25% combined for Problem Sets 1-3
Problem Set 2	20	25% combined for Problem Sets 1-3
Problem Set 3	20	25% combined for Problem Sets 1-3

Assignment	Points	Weight
Midterm	25	20%
Final Policy Brief + Technical Appendix	30	30% combined with Final Team Presentation
Final Team Presentation	10	30% combined with Final Policy Brief + Technical Appendix
Peer evaluation (in-class Qualtrics) and Active Team Participation	10	10%
Course Participation (lectures, discussions, Canvas, office hours)	5	5%

Grade	Weighted Score
A	80+
B	70-79
C	60-69
D	50-59
F	Less than 50

Description of Graded Components

You will get individual performance feedback on the problem sets, the midterm and quiz, and your final team project at several checkpoints. The problem sets are intended to be a key source of individual learning. The problem sets will be based on concepts from the readings, lectures/demos, and course textbook. They feature multi-part exercises and include hands-on programming and machine learning tasks that require you to experiment and build your human capital. Accompanying datasets and sample code in R or Python will be provided to get you started. You are encouraged to work with others on the problem sets, but you must write up your own solutions and submit your own replication code. No credit will be granted without replication code. Please do not wait until the last minute to get started on the problem sets.

Unless otherwise noted, the quiz and the midterm are in class, closed book, and closed notes. The midterm will test your ability to identify appropriate designs for data discovery. The format typically includes conceptual, quantitative, free response, and multiple-choice questions. On the Monday of midterm week, you will be given a full practice midterm packet in class, and we will review the suggested solutions together in class. We value a supportive learning environment and a culture of continuous improvement, regardless of one's starting competencies in programming or statistics.

Course Policies

Attendance and/or Participation

Active learning increases student performance ([PNAS study](#)).

This will be an active learning classroom (i.e., in-class demos, group discussions and workshops, etc. where attendance and course participation are an important part of student learning and counted in determining your final grade. Please keep in mind that excessive student absences affect the learning of other students in the course.

Absences

A student may miss class on occasion due to health, personal emergencies or Institute-approved absences. For information about expectations regarding student absences from class due to illness or personal emergencies, visit [Georgia Tech Student Absence Regulations](#)

For Institute Approved Absences (IIA) and to download the required form for students, visit [the Registrar's Institute Approved Absence page](#). Please keep in mind: Institute Approved Absences are not intended for personal travel, or time away from class that is based on personal needs or preferences. Students are expected to schedule classes around their personal needs if possible. The Student-Faculty Expectations section of the Catalog addresses job interviews: [Student-Faculty Expectations](#). Students should bear in mind in making the decision to request an excused absence that time missed from certain classes may be more difficult to make up than others (labs, studios, group presentations, team projects, etc.).

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 - Social Sciences

This course satisfies the Georgia Tech General Education Core IMPACTS requirement for Social Sciences. Core IMPACTS integrates foundational academic knowledge with career-ready competencies. This course directs students to a broad Orienting Question: How do I understand human experiences and connections?

Completion of this course should enable students to meet the following learning outcome:

Students will effectively analyze the complexity of human behavior and how historical, economic, political, social, or geographic relationships develop, persist, or change.

The course develops three career-ready competencies: intercultural competence, perspective-taking, and persuasion, including understanding different social and cultural contexts, considering multiple perspectives, and using evidence to communicate well-supported arguments.

Accommodations for Students with Disabilities

If you are a student that should require any special accommodations to help you succeed in this course, please contact the Office of Disability Services (404-894-2563) to make an appointment to discuss your special needs, and to obtain an accommodations letter. Please also e-mail me 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.

Course Targeting

This course is suitable for a wide range of majors and degree programs. The course is targeted for undergraduates in public policy, economics and other Ivan Allen College majors. The course is also suitable for computing, science, engineering, design or business majors seeking exposure to data science applications in social and public policy domains.

Pre- &/or Co-Requisites

Suggested pre-requisites include one course in elementary statistics and probability (PUBP 3120, MATH 1711 or equivalent). Students may find it useful to have some prior programming experience in R and/or Python, but it is not required. In partnership with the Georgia Tech library, introductory programming bootcamps will be incorporated into the semester schedule to support all students, regardless of their starting competencies.

Extra Credit Opportunities

To provide flexibility, please be on the lookout for bonus questions for extra credit appearing on the problem sets or the midterm. These questions could be drawn from lectures/readings and provide additional opportunities to demonstrate that you've absorbed the material covered in class.

Collaboration, Group Work, and Use of Generative AI

I encourage you to collaborate and exchange ideas on code implementations and problem solving with your peers. However, you must always write up your own solutions to the problem sets and you will submit all code for us to replicate to verify your work. If you use any open source packages or LLM resources, you must give attribution by commenting in your code file. As plagiarism is discoverable with software, I expect you to turn in original work and to cite your sources regularly in all assignments. Your best scholarship is in your own words.

Student use of Artificial Intelligence

Use of Generative AI in this course will vary from assignment to assignment. Some assignments may allow or even require Generative AI usage, while other assignments may limit or entirely prohibit use of Generative AI. Please check the instruction on each question in the Problem Set to determine what, if any, usage of Generative AI is allowed and/or required. Do not assume that because Generative AI was allowed for one assignment, it will be allowed on other assignments.

When allowed for usage on an assignment, responsible use is expected. All submitted work must include a brief AI Usage Statement outlining: (1) Which tools were used, (2) When they were used (3) What prompts or questions were given (4) How the AI output informed or shaped your final submission.

A word of advice: Please do not simply copy an LLM output verbatim. I suggest keeping documentation of your chat prompts and output, particularly for attribution of specific programming lines or tasks and in replication of your analyses. Using generative AI tools in the course without adhering to these principles may be considered an infraction of the Georgia Tech Honor Code, subject to investigation by the Office of Student Integrity. Go here for more information about [Georgia Tech's personal information privacy policy](#).

Students who simply turn in AI-generated code or solutions (e.g., screenshot) without attribution or the ability to replicate an output will be given an automatic zero on the problem or assignment. When in doubt, always consult your TA or instructor before using Generative AI.

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

All assignments will generally be due by 5:00 PM or 11:59PM EST on the scheduled due date, unless otherwise noted. In general, we can't take late assignments, save for unforeseen or extenuating circumstances. Late make-up assignments or submissions are discouraged and may be given only for documented reasons of illness, family emergency, or participation in Institute approved activities. Late work will be penalized at a rate of 10% per day (1 day late 90%, 2 days late 80%, 3 days late 70%, 4 or more days late 0%). If you should have any conflicts, please come talk to me outside of class as soon as possible.

Students who are absent because of participation in a particular religious observance will be permitted to make up the work missed during their absence with no late penalty, provided the student informs the course instructor of the upcoming absence, in writing, generally within the first two weeks of class, and provided the student makes up the missed material within the time frame established by the course instructor. Note that

current university policy affords students a makeup exam option when they have three or more exams scheduled in a twenty-four hour period.

Schedule Changes

Please note that the course schedule may be subject to change. I have intentionally left some flexibility in the schedule to allow us to spend more or less time on specific topics, depending on student interest, potential change in guest speaker schedules, or other considerations. We will support each other's preferences and stay flexible.

Inclement Weather and Digital Learning Days

If inclement weather affects campus operations, I will contact all students via email/Canvas/Slack about cancelling class or pivoting to a digital learning day synchronously via Zoom.

Student Use of Mobile Devices in the Classroom

So as not to disrupt student learning, please turn off the sound on all devices and kindly, no texting or messaging during class.

Course Materials and Submitting Assignments

All relevant data and materials will be freely available under Canvas >Assignments. They will also be accessible from the weekly modules page in Canvas. All course assignments will be submitted electronically via Canvas. You must write up your own answers and submit your own code and log files to get credit. A screenshot of the code or computer output is generally insufficient for credit. If you have any questions about submissions, please contact the instructor or TA.

IRB Certification for Research with Human Subjects

CITI Training

The Institutional Review Board (IRB) is a federally mandated panel tasked with protecting the rights and welfare of human subjects in research. At Georgia Tech, this process is administered by the Office of Research Integrity Assurance (ORIA). Each student in this course is required to complete the IRB training for conducting research using human subjects. To complete the training, follow the instructions at [Georgia Tech Research Integrity - IRB](#).

Please note that it may take up to 24 hrs or more after you register to be able to access the course. To activate the training modules, click the CITI Program link under "Required Training" and login with your Georgia Tech credentials. Be sure to choose the course titled: "Basic Course in the Protection of Human Research Subjects." You want Group 2: Social and Behavioral studies, and not animal studies. The entire program should take about 2-3 hours to complete and you may save your progress.

To receive credit for participation, you will upload a PDF of your completion certificate or your email confirmation to Canvas under the appropriate Assignment titled: IRB Citi Training Certificate. For more information about IRB, we will hold a course session on IRB training with representatives from ORIA.

Campus Resources for Students

A list of resources for undergraduate students' academic success and information about advising can be found at Success at Tech.

Undergraduate Student Academic Success Resources

Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. 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 [Success at Tech tutoring resources](#), email tutoring@gatech.edu, or visit Clough Undergraduate Learning Commons, Suite 283.

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 \(gatech.edu\)](http://student-resource-guide (gatech.edu)))

Smithgall Student Services Building, “Flag Building”, Suite 238, (404) 894-2575. [Georgia Tech Mental Health resources](#)