Data Analysis and Visualization with R
GTECH 38520 and 78520 - 01
Asynchronous – No required meeting times
Hosted on Brightspace

General Information:
Instructors: Shipeng Sun and Geoffrey Fouad
Email: shipeng.sun@hunter.cuny.edu and geoffrey.fouad@hunter.cuny.edu
Office hours: By appointment (Sun) and Thursday 10:00-1:00 pm in North Bldg 1044 (Fouad)

Course Description:
Introduce the basics of R including the practice of data preparation, modeling, and visualization, particularly in geospatial contexts. The class is online, asynchronous (no meeting times) but we may meet online or in person as needed. The course has two instructors as listed above.

Prerequisites: STAT 11300; Motivation to learn programming

Course Goals: You learn how to:
(1)   Prepare data for analysis/visualization in RStudio.
(2)   Model/visualize data in RStudio.
(3)   Lead your own investigation using R (see the project).

Required Material:
Brightspace
- The course is administered at https://brightspace.cuny.edu/

Recommended reading (there is no textbook)
- *ggplot2* (https://ggplot2-book.org/)
- *R for data science* (https://r4ds.hadley.nz/)
- *Geocomputation* (https://geocompr.robinlovelace.net/)
- *Spatial data science with R* (https://rspatial.org/raster/index.html)

RStudio (free version)
- Install R, then RStudio for free at https://posit.co/download/rstudio-desktop/

Grading:

Weekly assignments	Due weekly on Fridays	50% (10 at 5% each)
Project assignments		
Proposal	April 11	10%
Progress report	May 2	10%
Documented code	May 16	10%
Report	May 16	20%

Final grades exclude minus grades (e.g., B–) but include plus grades (e.g., B+) following:

https://hunter-undergraduate.catalog.cuny.edu/policies-and-requirements/academic-requirements/grading-policies/grading-definition

Late assignments only accepted up to one week after due date.

Extensions beyond this require notice before the due date including official documentation.

No assignments accepted after May 16.

Group work: You are encouraged to work collaboratively in groups to complete assignments and further your understanding (there is a discussion board to facilitate this), but you need to submit your own work (i.e., please no copy-pasting from each other as this does not help you learn).

Weekly assignments

– Hands-on assignments (ten total) in which you solve problems using R spanning three major modules including (1) the basics, (2) modeling and plotting, and (3) mapping

Project (see project guide for more details)

– Proposal: Propose what you plan to do, receive feedback, proceed to project development

– Progress report: Report progress/problems and receive guidance

– Documented code: Show that you know what you did in your code

– Report: Summary of project motivation, methods, and outcomes

Academic Integrity:

Academic dishonesty (e.g., plagiarism) is a serious offense in regards to academic integrity which defeats the purpose of a college education. As such, this course enforces the "CUNY Policy on Academic Integrity" and applies Hunter's procedures of "Academic Integrity."

Accommodations:

In compliance with the American Disability Act, Hunter College is committed to ensuring educational parity and accommodations for students with documented disabilities and/or medical conditions. It is recommended that students with documented disabilities (e.g., emotional or physical) consult the Office of AccessABILITY to secure necessary academic accommodations (see https://hunter.cuny.edu/students/health-wellness/accessibility/).

Sexual Misconduct:

Sexual misconduct, and more broadly harassment of any variety, is not tolerated, and will be referred to the appropriate compliance office for review. You are urged to refer misconduct to Hunter's Title IX Campus Coordinator, Dean John Rose (john.rose@hunter.cuny.edu), or see https://www.hunter.cuny.edu/diversityandcompliance/title-ix, and seek complimentary (free) assistance at https://hunter.cuny.edu/students/health-wellness/counseling-and-wellness-services/.

Diversity, equity, inclusion, and pronouns:

We live in a diverse world in which our diversity should be celebrated. Please notify me of your correct pronouns, and understand that our classroom is an inclusive environment where each of us can come together to learn.

Class Policies: The following policies are in place to help you learn.

(1)   Do not copy-paste from classmates (you will not learn doing this)

(2)   Find a quiet, distraction-limited place to do this work

(3)   Keep pace with the course (i.e., do not fall behind on assignments)

(4)   Learn by doing and trying new things (be inquisitive)

(5)   Ask for help if you are stuck

Schedule: This schedule is subject to change. Oscillating colors denote different modules.

Week – end date	Subject	Instructor	Deadlines
1 – 1/31	Introduction	Fouad	**Drop (1/31)**
2 – 2/7	Exploratory data analysis (univariate)	Fouad	
3 – 2/14	Exploratory data analysis (bivariate)	Fouad	
4 – 2/21	Data preparation for *tidyverse*	Fouad	
5 – 2/28	Modeling in *tidyverse*	Fouad	
6 – 3/7	Non-spatial visualization in *ggplot2*	Fouad	
7 – 3/14	Spatial data basics in *sf*	Sun	
8 – 3/21	Projecting and mapping in *ggplot2*	Sun	
9 – 3/28	Spatial join and analysis basics	Sun	
10 – 4/4	Spatial autocorrelation and regression	Sun	**Withdraw (4/1)**
11 – 4/11	Proposing a project	Sun/Fouad	**Proposal**
12 – 4/25	Project development	Sun/Fouad	
13 – 5/2	Report on progress	Sun/Fouad	**Progress report**
14 – 5/9	Respond to feedback on project	Sun/Fouad	
15 – 5/16	Package project	Sun/Fouad	**Report and code**