

Quantitative Methods in Geography
GTECH 30100/70200
Fall 2020 Syllabus
V1. Aug 12, 2020

Note: This is the first time this course is taught on line. So, all information in the syllabus is tentative, and subject to change.

Instructor: Allan Frei, afrei@hunter.cuny.edu
Office Hours: by appointment
Course Times: Wednesdays, 9:10AM-12PM
Course Room: 1090B-2 Hunter North (small lab)

Course Overview

The focus of this course is on the application of statistical methods that are common in geographic research. The goal is to understand these techniques so that you can later interpret and use them in an intelligent and appropriate manner; and so that you can learn how to explore related techniques independently. This course is “applied” in the sense that we focus on the application of these techniques more than on the derivation of equations. While we review information from introductory statistics courses, we focus on their application, using examples from physical and social sciences. This course will prepare you for more advanced spatial analysis topics covered in courses such as GTECH 70500.

The course will be “mixed” synchronous and asynchronous, meaning that we will meet every Wednesday morning at the scheduled time, but there will be asynchronous assignments as well.

The course has four sections. Each section lasts several weeks, with each week covering one module. Each model has assignments associated with it. Each of the four sections has a quiz.

1. Getting Started and Modeling Univariate Data
2. Modeling Bivariate Data
3. Modeling Multivariate Data
4. Data reduction: principle components analysis (PCA)

Prerequisites

The prerequisite for this course is an introductory statistics course such as STAT 11300 or STAT 21300 at Hunter College (or equivalent with permission of instructor).

Expected Learning Outcomes: After completing this course, you should be able to perform the following:

1. **Explore and model a data set.** Receive a file with data, evaluate its completeness, summarize both univariate and multivariate data in both numerical and graphical format using Exploratory Data Analysis techniques, and identify appropriate models for describing the probability distribution of the data
2. **Develop bivariate statistical models**
3. **Develop multivariate statistical models**
4. **Develop data reduction models** using Principal Components Analysis (PCA), and use PCA to identify the dominant signals in a multivariate data set.

Lectures

Lectures will be on Zoom. The URL for lectures will be provided over blackboard. Attendance is required. Each week covers one module, which may have more than one part.

Textbook

No text book is required for this course. We will use online resources and additional information provided by the professor through blackboard. Two good web sites are <http://www.biostathandbook.com/> and <http://www.statsoft.com/Textbook>, but there are many others you can find.

Software

No experience with any particular software package is absolutely required, although it is expected that students have familiarity with EXCEL, which we will be using for a variety of exercises. The primary statistical software package to be used is SPSS.

Evaluation

Final grades are based on the following. No extra credit assignments are given.

	<u>Percent of course grade</u>	
	undergrads	grads
HW Assignments:	75%	72.5%
Quizzes:	25%	22.5%
Grad Student Presentation		5%

Assignments

There is one module for each week, which typically has more than one part. There will be at least one assignment per module, typically two assignments, parts of which will be done during class time.

ASSIGNMENTS ARE DUE BEFORE THE BEGINNING OF CLASS ON THE DUE DATE. LATE ASSIGNMENTS WILL NOT BE ACCEPTED. All assignments must be submitted via blackboard. Some assignments may include different and/or additional work for graduate students.

Quizzes There are four quizzes during the semester, one for each section of the class.

Graduate Student Presentations

Graduate students are also required to discuss with Prof. Frei near the beginning of the semester their interest in this class, and their presentation to the class at the end of the semester. The presentation is to be about journal articles related to the course material, or statistical analyses related to the student's own research.

Communication with the Professor

To communicate with the professor: All email messages about this course should go to afrei@hunter.cuny.edu, should include "GTECH 301/702" in the subject line, and should be signed with your full name as it appears on blackboard or CUNYFirst. I try to respond promptly, but please do not hesitate to contact me again if I do not respond to your email within two days, or sooner if you need more urgent attention!

The professor will communicate with you: using the email address that Blackboard has.

Blackboard

Most material provided to students, and material submitted by students, will be through Blackboard. You will access homework assignments, check grades, upload your assignments, and submit your work, through Blackboard. Other material may be available on line.

Grading Policy

All grading for this course will follow the CUNY grading policy, which can be found: <http://catalog.hunter.cuny.edu/content.php?catoid=15&navoid=1433>.

Incomplete (IN) Grades

A final grade of IN (incomplete) will be given only under extraordinary and documented circumstances.

CR/NC Grades

The CR/NC grade is available only to undergraduate students that have fulfilled the requirements of the course, i.e., complete all course requirements, including all exams/quizzes, assignments, etc. CR/NC request forms must be submitted to the professor no later than 15 minutes prior to the beginning of the last quiz. The CR/NC option is available only to undergraduate students.

Software access

Options for access to SPSS software will be available on blackboard.

Class Environment on Zoom

To ensure that all class members feel welcomed and equally able to contribute to class discussions, we will all endeavor to be respectful in our language, our examples, and the manner in which we conduct our discussions and group work. If you have any concerns about the environment of the class, please contact the professor.

Hunter College Policy on Academic Integrity

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures. Be sure and reference all material you use. If you have any questions, please contact me!

Students with a Disability

In compliance with the *Americans with a Disability Act* and with Section 504 of the *Rehabilitation Act*, Hunter College is committed to ensuring educational access and accommodations for all its registered students. Hunter College's students with disabilities and medical conditions are encouraged to register with the Office of AccessABILITY for assistance and accommodation. For information and appointment contact the Office of AccessABILITY located in Room E1214 or call (212) 772-4857 /or TTY (212) 650-3230.

Hunter College Policy on Sexual Misconduct

In compliance with the CUNY Policy on Sexual Misconduct, Hunter College affirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationship. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

- a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444)
- b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, HE1123. The CUNY Policy on Sexual Misconduct Link is: <http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf>.

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Syllabus Changes

This syllabus and schedule are guides for the course and are subject to change without advance notice. All changes will be announced on Blackboard, by email, and/or in class.

Tentative Schedule (Subject to Change)
Details will be added as we go

Module number	Date	Topic
1	8/26	Section 1: Getting Started and Modeling Univariate Data (Modules 1-3) <ul style="list-style-type: none"> ○ Introduction to course, syllabus, student options for SPSS software ○ Module 1: what to do when you get a data file; Exploratory Data Analysis
2	9/2	Modeling Univariate Data: CDFs and PDFs
3	9/9	Modeling Univariate Data: Tests for Normality, Data Transformation
4	9/16	Section 2: Modeling Bivariate Data (Modules 4-7)
5	9/23	
6	9/30	
7	10/7	
	10/14	<i>No Class, Hunter College on Monday Schedule</i>
8	10/21	Section 3: Modeling Multivariate Data (Modules 8-11)
9	10/28	
10	11/4	
11	11/11	
12	11/18	Section 4: Data Reduction: Principal Components Analysis (Modules 12-14)
	11/25	<i>No Class, Hunter College on Friday Schedule</i>
13	12/2	
14	12/9	
Finals Week	Dec 14-18	Graduate Student Presentations