

GTECH 201

Introduction to Geographic Information Science

Spring 2022

Mondays and Wednesdays, 5:35 PM – 9:25 PM

Place of Instruction: Face-to-face in the Hunter Geography labs only
Credits/hours: 4/6
Instructors: [Jochen Albrecht](#) and [Rosy George](#)
Office Hours: In-person Mo/We 3:30 – 4:30 PM; you are encouraged to contact me anytime
Office: HN 1030
Pre-requisite: GEOG 101 or 150; MATH 101

Course Description

The general theme of this course could be entitled *Geography: the relationship game*. Geography is very much about relationships and in this course, we will establish a scientific framework for reasoning about relationships such as spatial coincidence, distance, vicinity, scale, geometry and attributes, geographic features and their representation on a map, etc. Hand-in-hand with each of the relationships, you will learn how to apply your knowledge using geographic information system tools.

Goal: Familiarize students with a set of spatial concepts and tools to implement them.

Objectives: Abstraction of everyday geographic observations to put them to use in a spatial decision-making context.

Outcomes: By the end of this course, you should have a good understanding of different types of geographic data and how they can be analyzed using geographic information systems. GTECH 201 forms the basis for a row of other GTECH courses that cover the range from cartography to advanced GIS applications. GTECH 201 is a required course because the skill set you acquire here will serve you well in all jobs related to geography and environmental studies.

Textbook

None – all reading materials will be posted on BlackBoard.

Criteria for evaluation

I do not grade on a curve. If many students get good grades, great! If many have mediocre grades, so be it; it will be disappointing and an incentive to do better. I will not try to trick you with impossible exams. Ideally, all can have 100 points! Final evaluation will be based on the following breakdown:

Lab exercises	43%
Individual studio project	17%
Participation in class	10% (we will use the BB discussion board extensively)
Midterm	10%
Final exam	20%

Policy on Incomplete (IN) and Credit/No-Credit (CR/NC) grades

A final grade of IN (incomplete) will not be given except under the most extraordinary, and documented, circumstances. CR/NC is not available to students enrolled in GTECH 201.

Course Policies

Announcements and grades will all be posted on [BlackBoard](#).

This spring 2022, we are transitioning back to fully in-person mode of instruction. The course is officially split into a lecture and a lab component, with lectures on Mondays and labs on Wednesdays. In reality, we will have a little more lecture than lab time and some labs will be on a Monday and some lectures on a Wednesday. "Lab days" may also contain a lecture component, in which case you will encounter both Jochen and Rosy on such a day.

Most of your work on the cartographic studio (your individual GIS project) will be outside of regular meeting times, although you are encouraged to contact either Jochen or Rosy for 1:1 (potentially online) meetings whenever you run into a problem.

The provisional schedule at the end of this syllabus is tentative and subject to change (which will always be announced on our GTECH 201 BlackBoard homepage. All official communication will be either via email or through [BlackBoard](#). You are required to check the BlackBoard course site on a *daily basis*. All changes to the syllabus will be announced on the course home page. All lecture, lab and reading materials are accessible through [BlackBoard](#), and this is also the place where you upload your assignments to. Your exams and assignments will be graded based on what you have uploaded to BlackBoard and this is where you will find your grades and may access course statistics that help you to assess your standing at any given time.

Communication

All email messages about this course should include GTECH 201 in the subject line and be signed with your full name.

Software (/Hardware) Requirements

We will be using software that runs as a so-called web service inside a browser, as well as desktop GIS software that at least for half of our lab exercises requires the Windows operating system. All the GIS software is either free and open source ([QGIS](#)) or can be downloaded for *free* using links that all properly enrolled students will be provided with ([ArcGIS Pro](#)). **It is the student's responsibility to install the GIS software on their computers! Alternatively, students may choose to login remotely to our lab computers, but this requires a strong and stable Internet connection. The final alternative is for students to attend class in our Hunter Geography labs. If none of these options work for you then you should not enroll in GTECH 201 this semester!**

Participation

Attendance is crucial. Assuming that the class-learning environment is active learning, adherence to protocols and the course timetable is very important. Lateness in arriving at class will not be tolerated. Class participation includes timely attendance and participation in organized class discussions, accomplishments of in-class tasks, and preparation of the reading assignments.

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.

ADA Policy

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, located in Room E1214B, to secure necessary academic accommodations. For further information and assistance, please call: (212) 772-4857 or (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, on 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) of Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct

The policy is available at <http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf>

Tentative Schedule

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. All changes will/would be announced on [BlackBoard](#), which you are expected to check on a *daily* basis. This syllabus is subject to updates. Changes will be announced in class and on Blackboard.

Session	Date	Topic
1	Jan 31	Introductions; going over the syllabus, previous software projects
2	Feb 02	Spatial reasoning; spatial relationships in everyday life
3	Feb 07	Formalizing spatial relationship; mathematical spaces
4	Feb 09	Simple data structures, tables, encoding of hierarchical relationships
5	Feb 16	Visualizing tabular data; business graphics
6	Feb 21	Presidents Day - no classes
7	Feb 23	Communicating with presentation software and web pages
8	Feb 28	Intro to GIS
9	Mar 02	The vector GIS data model
10	Mar 07	US Census Data and Geographies
11	Mar 09	Where to find data
12	Mar 14	Conceptual models; Geocoding
13	Mar 16	Preparing for the midterm
14	Mar 21	Midterm exam
15	Mar 23	Project management; requirements of the cartographic studio
16	Mar 28	GIS data structures
17	Mar 30	3-d GIS
18	Apr 04	Networks and network analysis
19	Apr 06	Geodetic datums and map projections
20	Apr 11	Map projections and geographic coordinate systems
21	Apr 13	Moving into GIS analysis
22	Apr 25	Buffer and overlay operations
23	Apr 27	Geoprocessing
24	May 02	Intro to raster GIS
25	May 04	Continuation of intro to raster GIS
26	May 09	GIS mapping
27	May 11	Developing expressions with Arcades
28	May 16	Studio presentations
	May 18	Final exam

Instructor expectations

Hunter College...

This is a place where students come to learn. It's a place where knowledge is developed and hopefully it's a place where students can see and participate in its development. Unlike previous schooling you don't have to be here, so we'll assume that you want to be here and that you are here to actively seek knowledge and skills.

With assumptions that you are (a) here of your own free will and (b) are actively seeking to gain knowledge and skills, there is only one fuzzy area (for some) - how to succeed! It's really quite simple: have fun. If you are enjoying what you are doing, you will succeed; if you are taking subjects or studying in a particular program and not enjoying it, you are unlikely to be successful.

A few words on success and enjoyment. Success is not just measured by your grade (but passing does help!), it is also measured by how you feel about what you are doing. You are the only person

who can really judge whether you are successful - have you met your own expectations? Enjoyment does not necessarily mean stress free living (although maybe it is for some!). Taking only subjects that you were told were "easy" doesn't guarantee enjoyment; some of us require a challenge in life! Again, only you are in a position to determine what you find enjoyable. A final thought on what a university is: this is also a place where faculty comes to learn...

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Students: to be successful you should be taking this subject because you want to take it, not because someone told you that you need to take it and you must be actively seeking knowledge and skills. This subject is a good participation "sport", but it's not a really good spectator event. You need to be proactive, be able to try something new, look at things from a new (spatial) perspective, ask questions. You need to know when to take a break, get some fresh air, rest your eyes (a Buddhist philosophy is quite useful...). Attend all sessions. When your absence is unavoidable, make sure you catch up on what was missed (the session recordings help). Plan your week as best as possible and make the commitment to spend the amount of time needed for you to be successful. Get a study partner or three, if this works for you. Remember, even if you are able to survive by cramming for exams, the subject matter will only go into short term memory. Eventually, you will reach a level where you can no longer survive by cramming, and your study habits will kill you.

Faculty: to be successful, I need to know that I've "made a difference" to at least some of my students, i.e., they feel successful. I'll provide a coherent subject structure, I'll deliver the best lecture possible on the day, and pointers to resources where possible and I will provide sound practical instruction and practice my listening skills so that I can understand what difficulties you may be having, so that we can resolve them. Furthermore, I am available and approachable; ask questions during class and at other times; use my almost continuous online presence to see me. Faculty have shown disappointing prowess at extra-sensory perception, please help me out!

We often lecture in subjects we are considered to have some expertise in; we are therefore fairly interested in the subject matter. We too are students in that we are continuing to learn new things in our areas of expertise and sometimes we are the ones who develop new knowledge in our areas of expertise!

Theory vs. practice: in lectures I try to provide an overview of the most important knowledge, but this never replaces the practical work on your cartographic studio. Sometimes lectures and labs will cover the same ground, but often, the best that can be done in some twenty-eight sessions is to provide just a "flavor" of the subject matter, something to whet your appetite, something to set the context for your own GIS work.

I wish us a lot of fun in this course,

A handwritten signature in black ink, appearing to read "J. Allard". The signature is written in a cursive, flowing style.