

GTECH 201

Introduction to Geographic Information Science

Fall 2021

Tuesdays and Fridays, 9:45 AM – 12:25 PM

Place of Instruction: Face-to-face in the Hunter Geography labs and fully online (the choice is yours)
Credits/hours: 4/6
Instructor: Jochen Albrecht, jochen.albrecht@gmail.com
Office Hours: There are no dedicated hours, but you are encouraged to contact me anytime
Office: HN 1032
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

All our sessions will be recorded via BlackBoard Collaborate. If you have a problem with that, please drop the course. While I acknowledge that some of you are working from home and have no dedicated quiet office, I urge you all to be fully present (without distractions) during our synchronous sessions.

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

This fall 2021, we are transitioning back from pandemic fully online mode of instruction to a choice of in-person or online. Your instructor will be physically present in the computer lab of the Geography Department and so will be many of you. All our sessions will be cast live via BlackBoard Collaborate and simultaneously recorded for asynchronous consumption.

The course is officially split into a lecture and a lab component, both to be held in sequence twice a week. In reality, some of our meeting days will be lecture only, others lab only or a mix of the two. I will strive for the mix to make our meeting more interactive but sometimes it takes a more than a good hour to move through some lecture or lab material. Experience before and during the pandemic suggests that the majority of students prefer live labs in the presence of the instructor. This is partly related to the option of being able to ask questions while the instructor is present and partly because many students (especially those usually working on Macintosh computers or having a poor Internet connection) prefer to have direct access to the GIS software. It is your choice whether you want to take this class in face-to-face or remote mode. However, **if you opt for the remote solution then it is your responsibility to install technically demanding MS Windows software on your own computer or to ascertain that you have a permanent and strong Internet connection that allows you to remotely log into our department's computers.**

Most of your work on the cartographic studio (your individual GIS project) will be asynchronous, although you are encouraged to contact the instructor for 1:1 (online) meetings whenever you run into a problem.

In consequence, if you opt for the remote version of this course, then you should reserve on your personal calendar the official time slots on Tuesday and Friday morning to always be ready for logging into BlackBoard for a synchronous (live) session. Not every Tu/Fr will be live and sometimes, it will be just for a lecture or a lab rather than both. Also, as of the time of writing, it is impossible to forecast whether a particular Tuesday or Friday session will be live; your professor will play it by ear how we are progressing through the material. The provisional schedule at the end of this syllabus is therefore tentative and subject to change (which will always be announced on our GTECH 201 BlackBoard homepage).

Our synchronous sessions will be conducted via BlackBoard Collaborate. In addition, there is the expectation that you will meet both in small groups and with your instructor at pre-arranged times and engage on an almost daily basis with your peers using the BlackBoard Discussion Board. Your peer meeting may (according your internal group agreements) use other electronic tools such as the ubiquitous Zoom (you can get a CUNY license for free) or the already free [Jitsi](#). However, 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, even in our new online environment, 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.

<i>Session</i>	<i>Date</i>	<i>Topic</i>
1	Aug 27	Introductions; going over the syllabus, previous software projects
2	Aug 31	Spatial reasoning; spatial relationships in everyday life
	Sep 03	No class
	Sep 07	No class – Rosh Hashana
3	Sep 10	Formalizing spatial relationship; mathematical spaces
4	Sep 14	Simple data structures, tables, encoding of hierarchical relationships
5	Sep 17	Visualizing tabular data; business graphics
6	Sep 21	Communicating with presentation software and web pages
7	Sep 24	Intro to GIS
8	Sep 28	The vector GIS data model
9	Oct 01	US Census Data and Geographies
10	Oct 05	Where to find data
11	Oct 08	Conceptual models and how they translate into data requirements
12	Oct 12	Geocoding
13	Oct 15	Preparing for the midterm
14	Oct 19	Midterm exam
15	Oct 22	Project management; requirements of the cartographic studio
16	Oct 26	GIS data structures
17	Oct 29	3-d GIS
18	Nov 02	Networks and network analysis
19	Nov 05	Geodetic datums and map projections

Session	Date	Topic
20	Nov 09	Map projections and geographic coordinate systems
21	Nov 12	Moving into GIS analysis
22	Nov 16	Buffer and overlay operations
23	Nov 19	Geoprocessing
24	Nov 23	Intro to raster GIS
	Nov 26	Thanksgiving break
25	Nov 30	Continuation of intro to raster GIS
26	Dec 03	GIS mapping
27	Dec 07	Developing expressions with Arcades
28	Dec 10	Studio presentations
	Dec 17	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...

GTECH 201 Introduction to Geographic Information Science

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 twentysix 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. Ollert". The signature is written in a cursive style with a large, sweeping initial "J" and a long, horizontal tail stroke.