

**GTECH 20100 - Introduction to Geographic Information Science**  
**Tuesday and Friday, 9:45 a.m. to 12:25 p.m.**  
**Hunter North 1090B-2**

**Instructor:** Manju Adikesavan

**Office Hours:** Tuesday and Friday, arranged over email

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**Course Overview:**

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 (GIS) tools.

**Goals:** Familiarize students with a set of spatial concepts and GIS tools to implement them.

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

**Outcomes:** By the end of this course, you will be able to

1. distinguish different GIS data models and formats and identify how they can be analyzed using GIS
2. describe and design a GIS production process from data modeling and acquisition to editing, analysis, and cartographic output.
3. work independently with GIS, determine what is easy to do with GIS, what will take you considerable amounts of time, and which spatial research questions do not lend themselves to a GIS solution.

**Required Textbook:**

None; all learning materials will be available on BlackBoard.

**Pre-requisites:**

GEOG 10100 or 15000, MATH 10100

**Useful Learning Materials:**

Albrecht, J. 2007. *Key Concepts and Techniques in GIS*. Free version available on CUNY Academic Works at [https://academicworks.cuny.edu/hc\\_pubs/10](https://academicworks.cuny.edu/hc_pubs/10)

Donnelly, F. 2019. *Introduction to GIS Using Open Source Software*. Available for free at [http://faculty.baruch.cuny.edu/geoportal/resources/practicum/gisprac\\_2019apr\\_fd.pdf](http://faculty.baruch.cuny.edu/geoportal/resources/practicum/gisprac_2019apr_fd.pdf)

Smith M., Goodchild, M. and P. Longley. 2018. *Geospatial Analysis: A Comprehensive Guide*. Leicester: Winchelsea Press. Free access at <http://www.spatialanalysisonline.com/>

QGIS. 2019. “*Documentation QGIS 3.4*”. Documentation for QGIS 3.4. Last updated 09:06 Jun 26, 2019. Available for free at <https://docs.qgis.org/3.4/en/docs/index.html>

**Policies:**

*Attendance* is crucial. Each week’s content builds on material covered in prior weeks hence adherence to the course timetable and deadlines is vital for success in this course. Much of the learning is active requiring undertaking the practical assignments systematically and learning the tools through hours of practice. Class participation includes timely attendance at laboratory sessions, participation in class discussions, completion of in-class tasks, and accomplishment of assignments on time. You are expected to behave responsibly towards the instructor and fellow students by not imposing a dominating or

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threatening presence in conversations and discussions, and by allowing others to speak and be heard, especially if they are shy and their voice weaker than yours.

*Assignments* are due one week after they are given in class. It is in your best interest to meet deadlines for assignments. Unless otherwise instructed, you will submit assignments in electronic form.

*Electronic recording devices* are allowed during lectures. All other personal electronics should be turned off before coming into the classroom. This includes cell and smart phones.

*Computers may be used for taking notes only*, and if you use them for activities not related to classroom content (e-mail, Facebook chats, surfing the Net...), you will be asked gently, but firmly, to turn them off.

*Lab policies* are described in detail in <http://www.geo.hunter.cuny.edu/techsupport/rules.html>. *Web-enhancement* in the context of this course means everything pertaining to this course will be communicated through BlackBoard. You are required to check the BlackBoard course site daily. All changes to the syllabus will be announced on BlackBoard. All lecture and lab materials are accessible through BlackBoard, and this is also the place where you upload your assignments. Your exams and lab 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.

*All email messages* about this course should include GTECH 20100 in the subject line and be signed with your full name as it appears in CUNYfirst. Any email with question about assignments, projects and exams will be answered within 24 hours unless noted otherwise.

### **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. Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according to Hunter College regulations. Academic dishonesty is simply not acceptable. Helping other students on use of the software is, however, encouraged.

### **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.

Special accommodations for persons with disabilities are provided upon request. Please see the instructor if you feel the need for them.

### **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)

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- 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](mailto:jtrose@hunter.cuny.edu) or 212-650-3262) of Colleen Barry ([colleen.barry@hunter.cuny.edu](mailto: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**

Link: <http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-withlinks.pdf>

*Syllabus change policy:* 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 notice. All changes will/would be announced on BlackBoard, which you are expected to check daily.

**Criteria for Evaluation:**

Evaluation of your performance is measured in theory and practice. The theory part is covered in the midterm and final exam. GIS can only be learned by doing. Hence 50% of the course grade is based on lab exercises and a final project. Active participation is an essential learning tool and hence encouraged by allowing for 5% of the course grade. 100 points is a definite possibility in this course. Final evaluation will be based on the following breakdown:

<b>Evaluation</b>	<b>Grade %</b>	<b>Date</b>
11 lab exercises	33%	Each assignment is due before the next one starts
Midterm exam	15%	October 22, 2019
Individual Project	17%	October 25, 2019 – December 13, 2019
Final exam (cumulative)	20%	To be determined (TBD)
Quizzes	10%	As noted in the course schedule
Participation	5%	Observed throughout the semester

**Policy for IN as a final course grade:** The instructor cannot accommodate students who are late in their work or do not show up for the exam or project presentation. And, unless you produce a medical certificate or letter from the Office of Accessibility, the final grade of IN (incomplete) will not be given. You must request an IN within 48 hours of the final exam and arrange to meet with your instructor and sign a Contract to Resolve an Incomplete Grade. The contract will set out the terms and conditions for the resolution of the IN. You have one semester to resolve the IN before it becomes a FIN.

A grade of “WU” will be assigned if a student stops attending class after official attendance verification, does not officially withdraw from the course (“W” grade) and does not submit the coursework (exams/assignments) required for earning a letter grade.

**Credit/No Credit Policy:** The CR/NC option will be honored only if the conditions stated on the CR/NC form are satisfied: all course work has been completed and you earned grades such that you accumulate at least 50 points total in the course. Credit/No Credit forms will be accepted up to 15 minutes before the scheduled start of the final exam. Students on academic probation are ineligible. Details of Hunter’s Credit/No credit policy and the form can be found at <http://www.hunter.cuny.edu/advising/howto/file-credit-no-credit-cr-nc>.

**Tips for successful learning:**

1. Schedule time to practice lab exercises and submit assignments on time
2. Figure out your learning and working style – the Center for Student Achievement, HW Rm 417, offers workshops and other resources to help you succeed in class.
3. Get a study buddy or form a study group, if that works for you and identify places suitable for group study.

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4. If you learn best by yourself in a quiet environment, identify places where you can work undisturbed.
5. Be prepared to learn from multiple sources - your peers, the instructor, the internet, etc.
6. Read lab exercises and lecture materials with care - never assume the meaning of terms, lookup/ask meanings of new terms, and note them in your personal GIS glossary.

**Course Schedule:**

<b>Week</b>	<b>Date</b>	<b>Day</b>	<b>Topic</b>
1	Aug-27	T	Session 1: Getting started; semester overview Labo: Getting to know your lab computer;
	Aug-30	F	Session 2: GISc vs GIS Labo: Preparing 'GIS-ready' spreadsheets
2	Sep-03	T	Session 3: Mathematical Foundations Lab 1: Thinking geographically
	Sep-06	F	Session 4: Geography as context Lab 1: Thinking geographically
3	Sep-10	T	Session 5: Presenting data and ideas, portfolio development - Part I Lab 2: Presenting data and ideas <a href="#">Quiz 1: Sessions 1 through 4</a>
	Sep-13	F	Session 6: Presenting data and ideas, portfolio development - Part II Lab 2: Presenting data and ideas
4	Sep-17	T	Session 7: Principles of GIS - Part I Lab 3: First Steps with ArcGIS Online
	Sep-20	F	Session 8: Principles of GIS - Part II Lab 3: First Steps with ArcGIS Online
5	Sep-24	T	Session 9: US Census data and mapping - Part I Lab 4: Accessing and displaying Census data with QGIS <a href="#">Quiz 2: Sessions 5 through 8</a>
	Sep-27	F	Session 10: US Census data and mapping - Part II Lab 4: Accessing and displaying Census data with QGIS
6	<b>Oct-01</b>	<b>T</b>	<b>No Class</b>
	Oct-04	F	Session 11: Data input, where to find data Lab 5: Interrogating NYC'S Data Mine with Carto
7	<b>Oct-08</b>	<b>T</b>	<b>No Class</b>
	Oct-11	F	Session 12: Data input, where to find data Lab 5: Interrogating NYC'S Data Mine with Carto
8	Oct-15	T	Session 13: From shape files to databases - Part I Lab: 6 Organize a geographic database with ArcCatalog
	Oct-18	F	Session 14: From shape files to databases - Part II Lab: 6 Organize a geographic database with ArcCatalog <a href="#">Quiz 3: Sessions 9 through 14</a>

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9	<b>Oct-22</b>	<b>T</b>	<b>Midterm exam</b>
	Oct-25	F	<a href="#">Project proposal due</a> Session 15: Projections and reference systems Lab 7: Comparing map projections in ArcGIS & QGIS
10	Oct-29	T	Session 16: Projections and reference systems Lab 7: Comparing map projections in ArcGIS & QGIS <a href="#">Project Update 1</a>
	Nov-01	F	Session 17: Basic GIS analysis operations - Part I Lab 8: Getting started with GIS analysis <a href="#">Project Update 1</a>
11	Nov-05	T	Session 18: Basic GIS analysis operations - Part II Lab 8: Getting started with GIS analysis
	Nov-08	F	Session 19: Geoprocessing - Part I Lab 9: Geoprocessing <a href="#">Quiz 4: Sessions 15 through 18</a>
12	Nov-12	T	Session 20: Geoprocessing - Part II Lab 9: Geoprocessing <a href="#">Project Update 2</a>
	Nov-15	F	Session 21: Introduction to raster GIS - Part I Lab 10: Working with raster data (ArcGIS & QGIS) <a href="#">Project Update 2</a>
13	Nov-19	T	Session 22: Introduction to raster GIS - Part II Lab 10: Working with raster data (ArcGIS & QGIS)
	Nov-22	F	Session 23: Map Design - Part I Lab 11: Basic mapping with ArcGIS
14	Nov-26	T	Session 24: Map Design - Part II Lab 11: Basic mapping with ArcGIS
	<b>Nov-29</b>	<b>F</b>	<b>College Closed</b>
15	Dec-03	T	Session 25: GIS & Society - Part I Lab: Project <a href="#">Quiz 5: Sessions 19 through 24</a> <a href="#">Project Update 3</a>
	Dec-06	F	Session 26: GIS & Society - Part II Lab: Project <a href="#">Project Update 3</a>
16	Dec-10	T	Session 27: Project presentation
	<b>TBD</b>		Session 28: <b>Final Exam</b>