

GTECH 10100 Digital Earth

Spring 2018

Wednesday, 9:10 AM to 12:00 PM
Hunter North 1022

Instructor Sean Ahearn

Email: sahearn@hunter.cuny.edu. Please include GTECH 10100 in your subject line and sign your name as it appears in CUNYfirst and use your Hunter email.

Office: HN 1023

Office hours: Wednesday, 3:00 to 5:00 PM and by appointment

Short description

We are living in a digital and data-intensive era and geospatial technologies have become an integral part of life. Searching for business locations (restaurants, shops, gas stations, etc.) and driving directions using web maps and geospatial web services such as Google or Bing maps, or using GPS devices and smart phones, has become routine (e.g. Uber). Geospatial technologies enable us to capture, store, process and display a vast amount of geographic information about the Earth and the environment. A "Digital Earth" is a multi-resolution, three-dimensional representation of the planet, into which we can embed vast quantities of geo-referenced data" (from Vice President Al Gore speech given at the California Science Center, Los Angeles, California, on January 31, 1998.). The "Digital Earth" is a visionary concept for creating a digital representation of the Earth, a digital mirror world, storing and managing access to everything that is known about the planet. (Grossner et al. 2008). This course primarily aims to familiarize you with the basic concepts of geospatial technologies and geospatial datasets used to create a Digital Earth. This course is intended to equip you with skills needed to locate, gather, and use geospatial data.

Expected Learning Outcomes

1. Describe the concept of Digital Earth and explain how and why Geographic Information is vital to knowing our planet.
2. Explain the underlying geospatial technologies of a Digital Earth and will appreciate the broad implications of Geospatial Research.
3. Equip you with the skills needed to locate, gather, manipulate, present and use geospatial information.
4. By the end of this course, you will apply the relevant computer knowledge and gain needed skills to apply the basic geospatial technologies of GIS and remote sensing to problem solving.

Software used in class

Windows operating system
ESRI ArcGIS, QGIS, MultiSpec

You are expected to be familiar with the Windows operating system but the basics of ESRI ArcGIS, QGIS, and MultiSpec will be taught in class.

Course Readings

Required Textbook: Bradley A. Shellito (2016), *Introductions to Geospatial Technologies*, 3rd edition. ISBN-10: 1-4641-8872-6. This textbook is also offered as an eTextbook at a higher price point than the softcover version. Check out online retailers for more options.

Recommended but not required: Campbell, J., Shin, M., (2011), Essentials of Geographic Information Systems, Saylor Foundation. (Free access at <https://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=67>). David DiBiase, (2013).

The Nature of Geographic Information. An e-book that is openly available to the public as part of Penn State University's Open Educational Resources Initiative (<https://www.e-education.psu.edu/natureofgeoinfo/node/1672>)

Student Evaluation

Lab assignments and in-class activities (overall 50%). A series of lab assignments and in-class activities will constitute 50% of the grade required for this course. In-class activities and lab assignments will be handed out and explained during class. Assignments are due at the beginning of class on the due date. Activities are due at the end of class session.

Final map project (15%). During the semester students will work on a final map project on a theme of their choice. Students will then present their map in the last session of the semester. Detailed instructions for the final map project will be given in class. (See date on course schedule)

Individual and cooperative exams (30%). (See date on course schedule).

Two exams are given as a midterm and second exam (mid-semester exam at 15% and second exam at 15% points). The exams include a combination of multiple-choice, long and short answer questions. Each exam is given twice during one class period: In Part A (80% of total exam grade) students take the exam individually for the first part of the class. Then, when all students have turned in the exam, in Part B (20% of total exam grade) they retake the exam working in groups and in an open-book, open-notes format. During Part B, students are able to talk with anyone in class as they take the exam but not to the instructor. Students must participate in both parts of the exam (A and B) to earn a passing grade. This exam style is called a "Pyramid Exam" or "two-stages" exam.

Activities (5%). Two in-class activities: 1) map projections and 2) map comparison.

NOTE: Late submission and exam policies.

- 50% of the grade is deducted for late assignments submitted after the regular due date and time. No points can be earned for late or missing in-class activities.
- No points can be earned for assignments submitted later than one week after the regular due date and time.
- Do not miss an exam. Make-up exams will NOT be given except under the most extraordinary circumstances such as documented illness, documented death in the family, documented alien abduction, etc. Make-up exams will be given at a mutually convenient time and while they will cover the same information as the original exam, the questions and/or practical materials will be different. A final grades of IN (incomplete) is not normally given in this course except under the most extraordinary and documented circumstances. To qualify for Credit/No Credit you must have completed all course work, taken all exams, and have satisfactory attendance and participation. Credit/No Credit forms will be accepted up to 15 minutes prior to the start time for the second exam. I will not accept a Credit/No Credit slip after the second exam is distributed. The Hunter College grading system, which shows you what the numerical grade equivalents of the letter grades A, A-, B+, etc., will be used in this class and can be viewed in the latest undergraduate catalog available online at <http://catalog.hunter.cuny.edu/content.php?catoid=15&navoid=1433>.

Course Schedule

Week	Date	Topic	Notes
1	31 Jan.	Course introduction and overview Digital Earth and geospatial technologies. Lab: intro to computer systems	Chapter 1 in your text book (Shellito)
2	7 Feb.	Scale, datum and Map projections	Chapter 2 in Shellito
3	14 Feb.	Coordinate systems and transformations Lab: working with Google Earth Info on final map projects	Chapter 3: Georeferencing; and Chapter 4: GPS Shellito
4	21 Feb.	Geospatial data Geographic Information Systems GIS data types	Chapter 5 in Shellito
5	28 Feb.	GIS for Spatial Analysis	Chapter 6
6	7 Mar.	Making Maps	Chapter 7
7	14 Mar.	Getting there with Geospatial data And review for midterm	Chapter 8
8	21 Mar.	Midterm	
9	28 Mar	Remote sensing images from above	Chapter 9
10	18 Apr.	How remote sensing works	Chapter 10
11	25 Apr.	Images from space and environmental analysis	Chapter 11 & 12
12	2 May	Digital landscapes and Exam review	Chapter 13
13	9 May	Second exam	
14	16 May	Geospatial research and technologies in action Activity: Geospatial mobile apps	Chapter 14 & 15
15	TBD	Final map presentation and feedback. Requests for IN and CR/NC must be submitted no later than 5:00 PM on this date	

Course Policies

Communication

All email messages about this course should include "GTECH 101" in the subject line and be signed with your full name as it appears in CUNYfirst.

Web-enhancement

Everything pertaining to this course will be communicated 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 and lab materials are accessible through BlackBoard, and this is also the place where you upload your assignments to. 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.

Lab Access

The lab(s) (room HN 1090B) are generally open 7 days a week, 24 hours a day, and students with appropriate access are entitled to work in these labs when the labs are not being used for teaching. [On days when the entire college is closed access to the labs is restricted to those students who have gained prior permission to use the labs.] Additional information on labs and lab policies is available here: <http://www.geo.hunter.cuny.edu/techsupport/rules.html>. Please ensure you have a Geography account - login and password. You will still be responsible for handing in the labs on time if your account is suspended because of non-compliance. If you do **not** have a Department of Geography computer account you must complete the application found at http://www.geo.hunter.cuny.edu/techsupport/comp_account.html.

Class Climate

Hunter has made a conscientious effort to increase diversity in the student, staff and faculty member populations. 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 climate of the class, please contact me.

Academic Standards

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. Be sure and reference all material you use. If you have any questions, please contact me!

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 to secure necessary academic accommodations.

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

Syllabus Changes

Changes to the syllabus are possible. Except for changes that substantially affect implementation of the evaluation (grading) statement, the current 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.