GTECH 38518/78518 – Environmental Data Science
Fall 2023
Tuesday 11:30AM - 2:20PM HN1090B

Contact Information

Instructor:	Dr. Wenge Ni-Meister
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Office hours:	Tuesday: 4:30pm-5:30pm or by appointment
Department Information:	HN1006

Prerequisites: GTECH20100/70900 An introductory statistics course is strongly recommended. Background in remote sensing is a plus but not required. You can also take GTECH 32100/71200 concurrently with this course.

Required textbook None. We will use all online materials.

Course Description: 3 credits/3 hours**.**

This course equips students with cutting-edge abilities in data science. Students will learn geospatial data analysis and visualization skills using open-source Python tools and publicly accessible environmental data. The initial portion of the course hones fundamental Python data science proficiencies, while the latter half delves into the manipulation of extensive geospatial information and the implementation of machine learning algorithms. Students will complete final projects, wherein they employ actual environmental datasets to address and resolve environmental issues.

Course Objectives and Learning Outcomes: Students will gain various programming skills and conduct scientific research upon completing this course. More specifically, students will be able to
- **Gather and organize environmental** data programmatically using Python for deeper analysis.
- **Analyze** the trends, **discover** patterns in the environment data, and **extract** conclusions.
- **Model** complex phenomena**, predict** future trends, and **use** data to **automate decisions**.
- **Display** information visually and **communicate** your findings clearly and compellingly.

Grading:

Lab exercises	40%
Mid-term	20%
Final Exam/Final project	40%

Lab exercises consist of conceptual questions requiring written responses and computational questions requiring coding in Python. Late work will be accepted with a 10% penalty for each day.

The mid-term will be in a mini-project format. Students will use provided datasets and complete specific tasks. It is an open-book and take-home exam focusing on practicing Python's essential data analysis skills. Graduate and undergraduate students will be given different exams.

Each student will complete a final research project and present it for the final exam at the end of the semester. It must be centered around analyzing environmental data using python programming skills learned in class. Graduate students are expected to do more comprehensive final projects than undergraduate students. Different grading systems will be used for undergraduate and graduate students.

All required work must be submitted through BB, and I do not take any submissions by email.

Grading Policy

Grading will follow Hunter College policy outlined in the latest online undergraduate and graduate catalogs that can be found **at http://catalog.hunter.cuny.edu/.**
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I do not give incompletes (IN) except under the most extraordinary and documented circumstances. You must contact me within 48 hours of the final exam and request IN as a grade. At that time, undergraduates will schedule a date to meet with me at the college and complete a Contract to Resolve Incomplete Grades. Otherwise, I will average the grades I have for you and record your earned grade.

If you miss the final exam, you must (1) contact me within 48 hours of the missed exam, (2) present acceptable documentary evidence for your absence, and (3) be available for the make-up exam (Note: there will be one make-up exam day at the end of the semester held outside of class for those eligible). A make-up exam covers the same material as the regular exam but will not be the same exam given as scheduled. (i.e., DON'T MISS AN EXAM).

Only undergraduate students are eligible for credit/no credit (C/NC) as a final course grade. Please see the college's policy on C/NC at
http://catalog.hunter.cuny.edu/content.php?catoid=37&navoid=10489. You must submit your CR/NC form in person no later than 15 minutes before the final presentation.

Resources

- All class material will be posted on Bb.

Essential Policy Information:

- Attendance/lateness policy: It is vital to attend the regular classes and take detailed notes. Students who attend classes regularly are much more successful than those who are not.
- Email Policy
  - Please use GTECH 38518/78518 Environmental Data Science in the subject line when you email me. I do not answer emails with short subject lines.
  - Email me from your @myhunter account, not your personal email address.
  - Please sign your full name as it appears in CUNYfirst to any message. I do not answer unsigned email messages.
  - Students' emails will be responded to within 24 hours. Please note there will be a delay for messages sent over the weekend or during non-business hours.

Hunter College Statement 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 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.

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 relationships. 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 Change Policy
- Except for changes that substantially affect the implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.
- Any changes will be updated through Bb.

Tentative Weekly Schedule

Week	Date	Lectures /Labs
Week 1	8/29/2023	Introduction to Data Science and Jupyter Notebook (I)
Week 2	9/5/2023	Basic Python
Week 3	9/12/2023	Basic Python
Week 4	9/19/2023	Numpy
Week 5	9/26/2023	Pandas
Week 6	10/3/2023	Data Visualization and Data Analysis
	10/10/2023	A Monday Schedule
Week 7	10/17/2023	Object Oriented Programming
Week 8	10/24/2023	Midterm
Week 9	10/31/2023	Geospatial Data Analysis – Vector 1
Week 10	11/7/2023	Geospatial Data Analysis – Raster 1
Week 11	11/14/2023	Geospatial Data Analysis – Raster 2
Week 12	11/21/2023	Lidar Data Processing
Week 13	11/28/2023	Machine Learning
Week 14	12/5/2022	Final Project Preparation
	12/12/2023	Reading Day
Week 15	12/19/2022	**Final Project Presentation**