GTECH 32100/GTECH71200
Remote Sensing of the Environment
Fall 2023 – in person
Tuesday 5:30 PM – 9:10 PM, HN1090B

Contact Information

Instructor: Dr. Wenge Ni-Meister
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Office: HN1029
Office Phone: 212-772-5321
Office hours: Tuesday: 4:30pm-5:30pm pm or by appointment
Department Information: HN1006

Prerequisites: GTECH 201/709 or permission of instructor

Course Materials:

(Optional) Remote Sensing of The Environment, 2nd Edition, John R. Jensen, Pearson Prentice Hall, ISBN-13: 978-0131889507 and ISBN-10: 10131889508.
(Optional) Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, John R. Jensen, Pearson Prentice Hall, ISBN-13: 978-0134058160 and ISBN-10: 013405816X.

Course Description:

This is an introductory course to remote sensing. Students will learn how remote sensing works, what satellite data are available, and how they are being used. We first introduce the basic principles of how satellites detect and monitor the physical characteristics of our Earth. Then, we will discuss various satellite sensors for making measurements across the optical, thermal, and microwave electromagnetic spectrum and multiple applications of using these data. Students will learn basic skills to extract useful information from satellite imagery data for various applications. The course has heavy lab components. The labs are primarily devoted to learning how to use image processing software – ENVI and ArcGIS to analyze satellite images.

Learning Outcomes:

At the end of this course, students will:

- Identify and define basic remote sensing principles
- Recognize and explain how the remote sensing data are collected
- Analyze remote sensing images using image processing tools ENVI
- Distinguish and state how different satellites monitor our changing environment.
- Transform satellite data into solutions to environmental problems

Grading:

Lab exercises	40%
Final Exam/Final project	40%
Quizzes	20%

Lab exercises will be given weekly to learn image processing skills using ENVI. Lab homework is due one week after each lab. It is in your best interests to meet deadlines for all lab assignments. Unless otherwise instructed, you will submit all your projects in electronic forms through BlackBoard. All labs

are designed to complete during your lab period. You are free to work with them after class. You are responsible for managing your time to finish your lab on time.

Quizzes: Instead of the in-class midterm exam, quizzes will be given at the beginning of each class meeting. Examinations include short-answer questions based on the material covered in previous lectures. **There are no make-up quizzes.**

Final Project/Final Exam includes your final project paper and a project presentation to the class at the end of the semester. For the final project, you will use the image processing skills learned through the course to analyze satellite images to solve a physical or social environmental problem. Graduate students are expected to do much more complete final projects than undergraduate students. Different grading systems will be applied to undergraduate and graduate students. **The final papers and presentations are due on the final exam date. No late work will be accepted after the last exam date.**

You need to submit all the necessary work to BB. I do not take any submissions by email.

Grading Policy

Grading will follow Hunter College policy outlined in the online undergraduate catalog: **at http://catalog.hunter.cuny.edu/**. 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. You will schedule a date to complete a Contract to Resolve Incomplete Grades at that time. Otherwise, I will average the steps I have for you and record the grade you have earned.

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 no later than 15 minutes before the final presentation period.

Resources

- All class material will be posted on Bb.

Essential Policy Information:

- Attendance/lateness policy: It is essential to attend the regular lectures and labs and take detailed notes. Students who attend classes regularly are much more successful than those who are not.
- Email Policy
  - Please use GTECH321/712 Remote Sensing of Environment in the subject line when you email me. I do not answer emails with short subject lines.
  - Email me from your @myhunter account. Please sign your full name to any message. I do not answer unsigned email messages.
  - The student's email 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.
- Cell Phone Policy

- Out of respect for preserving a positive learning environment, all cell phones and other portable noise-making devices must be SILENCED during the period. Cell phone use is prohibited in the classroom. If you have to use it, please walk out of the classroom.

Hunter College Statement on Academic Integrity

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsififalsifyings 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, dishonelyingeating 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 Se 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. **You must be registered with the Office of AccessABILITY to qualify for the 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 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 complementary 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 Daily Schedule and Readings

Week	Date	Lecture Topics	Labs
xWeek 1	8/29/2023	Overview of the Course	Introduction to ENVI
xWeek 2	9/5/2023	Physical Principles: Electromagnetic Radiation (EMR)	Image Display
xWeek 3	9/12/2023	Physical Principles: Light Interaction with Atmosphere	Basic Image Formats
xWeek 4	9/19/2023	Physical Principles: Light Interaction with Surface	ENVI Basic Functions
Week 5	9/26//2023	online	Online Satellite Images
Week 6	10/3/2023	Satellite Remote Sensing Systems	Spatiotemporal Analysis
	10/10/2023	A Monday schedule	
Week 7	10/17/2023	Feature Extraction: Image Preprocessing	Image Preprocessing
Week 8	10/24/2023	Feature Extraction: Image Enhancement	Image Enhancement
Week 9	10/31/2023	Feature Extraction: Image Classification	Image Classification
Week 10	11//7/2023	Feature Extraction: Accuracy Assessment	Accuracy Assessment
Week 11	11/14/2023	Feature Extraction: Change Detection	Change Detection
Week 12	11/21/2023	Thermal RS	Urban Heat
Week 13	11/28/2023	Lidar/Radar Sensors and Applications	
Week 14	12/5/2023	Final Review	
	12/12/2023	**Reading Day**	
Week 15	12/19/2023	Final Paper Due	Final Project Presentation