

GTECH 32100/GTECH 71200-- Remote Sensing of the Environment
Spring 2017
Wednesday 5:35 PM – 8:55 PM, HN1090B-1

Contact Information

Instructor: Dr. Wenge Ni-Meister
Email: Wenge.Ni-Meister@hunter.cuny.edu
Office: HN1029
Office Phone: 212-772-5321
Office hours: Tuesday: 4:30-5:30pm or by appointment
Department Information: HN1006, Phone: 212-772-5265

Prerequisites: GTECH 20300/71000 or permission of instructor

Course Materials:

Introduction to Remote Sensing, Fifth Edition 5th Edition, James B. Campbell and Randolph H. Wynne, The Guilford Press, ISBN-13: 978-1609181765 and ISBN-10: 160918176X

Course Description:

The objective of this course is to provide an overall introduction to remote sensing, particularly focused on the use of satellite imagery to study the environment. The course covers two main topics: remote sensing principles and satellite sensors. The first half of semester we focus on the physical processes involved in remote sensing to understand the nature and properties of electromagnetic radiation and how it interacts with atmosphere and the Earth's surface. The second half of the semester we will learn the wide variety of satellite sensors, which make measurements in the optical, thermal and microwave electromagnetic spectrum. Different sensors are designed to sense different attributes of the Earth and the atmosphere and for different applications. We explore how different sensors are used to study issues related to global environmental science and natural resource management.

The course includes heavy lab components, which will be supplemented by topics covered during lectures. The labs will include practical assignments, field exercises, and computer-based analysis of remotely-sensed images. The labs are primarily devoted to learning how to use image processing software – ENVI to analyze satellite images. **If you are interested in purchasing a student's version of ENVI, check this website for more details:** <http://www.harrisgeospatial.com/Industries/Academic/Students/StudentLicenses.aspx>

Learning Outcomes:

At the end of this course, students will:

- Understand basic remote sensing principles and how different satellite sensors are used to monitor our environment.
- Be acquainted with the image analysis skills using ENVI.
- Use remote sensing for mapping and monitoring natural resources.

Grading:

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

Lab exercises will be given each week to learn basic image processing skills using ENVI.

Two Quizzes/Midterms will be given at the end of each unit.

Final Project/Final Exam includes your final project paper and 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 process a satellite image for a physical or social environmental problem. Graduate students are expected to do much more comprehensive final projects than undergraduate students. Different grading system will be used for undergraduate and graduate students.

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

Grading Policy

Grading will follow Hunter College policy as explained at <http://catalog.hunter.cuny.edu/content.php?catoid=22&navoid=2774> for graduate students and <http://catalog.hunter.cuny.edu/content.php?catoid=23&navoid=3507> for undergraduate students.

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 you 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 the grade you have earned.

If you miss an 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**).

Resources

- All class material will be posted on Bb.

Essential Policy Information:

- Attendance/lateness policy: I expect to see you 5:35 pm – 8:55 pm Wednesday in HN1090B -2 unless I receive acceptable documentary evidence for your absence ahead of time, otherwise you will be marked with missing a class.
- Late work/missed tests/Incompletes: The last day to receive the required lab work is May 17, 2016, unless I receive acceptable documentary evidence for your tardiness.
- Email Policy
 - Please use GTECH321/712 Remote Sensing of Environment in the subject line when you email me. I do not answer email with insufficient subject lines
 - Please sign your full name as it appears in CUNYfirst to any message. I do not answer unsigned email messages.
 - Student's email will be responded 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.

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 advance notice.
- Any changes will be updated through Bb.

Tentative Daily Schedule and Readings

Week	Date	Lecture Topics	Labs	Readings
Week 1	Feb. 1	Overview of the Course	Introduction to ENVI	Ch 1
Week 2	Feb. 8	Physical Principles: Electromagnetic Radiation (EMR)	Image Display	Ch 2
	Feb. 15	Classes Follow a Monday Schedule		
Week 3	Feb. 22	Physical Principles: Light Interaction with Atmosphere	Basic Image Formats	Ch2
Week 4	Mar. 1	Physical Principles: Light Interaction with Surface	ENVI Basic Functions	Ch 2,17,18,19
Week 5	Mar. 8	Satellite Remote Sensing Systems	ENVI Basic Functions	Ch 6
Week 6	Mar. 15	Satellite Remote Sensing Systems	Satellite Imagery Online	Ch 6
Week 7	Mar. 22	Feature Extraction: Preprocessing	Image Enhancement	Ch 11
Week 8	Mar. 29	Feature Extraction: Image Classification	Image Classification	Ch 12
Week 9	Apr. 5	Feature Extraction: Accuracy Assessment	Image Classification	Ch 14
	Apr. 12	Spring Recess		
Week 10	Apr. 19	Change Detection	Change Detection	Ch 16
Week 11	Apr. 26	Thermal Sensors and Application	Urban Heat	Ch 9
Week 12	May 3	Lidar Sensors and Applications	Final Project	Ch 8
Week 13	May 10	Microwave Sensors and Application	Final Project	Ch 7
Week 14	May 17	Final Review	Final Project Presentation	
Week 15	May 24	Final Paper Due	Final Project Presentation	