SET 303 – Photogrammetry and Aerial Photo Interpretation

Fall 2022

LECTURE	Thursday 6 pm – 8:50 pm (FMH 313)
LAB	Wednesday 6 pm – 8:50 pm (MALL PC39)
INSTRUCTOR	Dr. Huiran Jin
CONTACT	huiran.jin@njit.edu
	(973) 596-3249
OFFICE HOURS	Thursday 11 am – 2 pm at GITC 2514 (or on campus by appointment)
COURSE STRUCTURE	(3-3-4) (lecture hr/wk - lab hr/wk - course credits)
COURSE DESCRIPTION	This course reviews the principles of photogrammetry and remote sensing as they relate to engineering, land surveying and geographic information systems (GIS). This includes developing an understanding of the necessary optics, mathematics, image processing, and computer science fundamentals. Photographic and digital photogrammetry will be covered with an emphasis placed on the process of designing and establishing the required data for the acquisition of photogrammetric information according to standards and procedures.
PREREQUISITE(S) CO REQUISITE(S)	SET 200 or equivalent
REQUIRED, ELECTIVE OR SELECTED ELECTIVE	Required
TEXTBOOK & REQUIRED MATERIALS	A. P.R. Wolf, B.A. DeWitt, & B.E. Wilkinson. (2014). *Elements of Photogrammetry with Applications in GIS (4th Edition)*. McGraw-Hill Education.
	B. Technical Journal Articles.
	C. Federal, State and Professional Standards/Procedures.
COMPUTER USAGE	ERDAS Imagine, Microsoft Word & Excel, etc.

CLASS TOPICS	Photogrammetric principles and optics, mathematics of photogrammetry and photographic systems. Geometry and properties of vertical and tilted photographs, photographic measurements, refinements and parallax. Elementary methods of planimetric mapping. Project planning and standards. Digital photogrammetry and digital image processing. Laser scanning systems and airborne LiDAR. Orthophotography and topographic mapping.

GRADING POLICY

Lab	25 %
Homework	20 %
Quiz	10 %
Midterm	20 %
Final	25 %

A	> 90
B+	82–89.9
B	75–81.9
C+	70–74.9
C	65–69.9
D	60–64.9
F	< 60

IMPORTANT NOTES:
A. Attendance to every lab is required. Each student will be given a score by the Instructor of the lab session at the end of the semester.
B. Homework should only be submitted electronically through CANVAS. Details must be shown step by step.
C. Each homework is due ONE week from assignment. Answers and key steps to solve the problems will be posted after the due date. **Unless approved by the Instructor before the deadline, late submission will not be accepted/graded and a zero will be assigned automatically.**
D. Quizzes will consist of five (5) T/F or multiple choice questions. Students need to take the quizzes in class.
E. No makeup Midterm/Final exams will be provided unless students' absence is approved by the Dean of Students. Students not taking the Final exam without being excused will receive a grade of F.
F. Adjustments on the letter grade assignment and/or curving of the final scores might be applied based on the overall performance of the class.

ACADEMIC INTEGRITY

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** **_Also, per NJIT policies, both parties, including the one who offered the "help", may be subject to the same penalty._** *If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.*

STUDENT BEHAVIOR

- Cellular phones must be turned off during the class hours – if you are expecting an emergency call, leave it on vibrate.
- Unless the Instructor allows the use of electronic devices (i.e. iPad, Computer), these should be closed/turn-off during lecture.
- You should try to be part of a discussion.

MODIFICATION TO COURSE

The Course Outline below may be modified at the discretion of the Instructor in the event of extenuating circumstances. Students will be notified in advance of any changes to the outline.

COURSE OUTLINE

Week	Date	Topic of Lecture	Reading	Assignment
1	9/8	• Introduction • Applications of Aerial Photography	Ch. 1	#1
2	9/15	• Principles of Photography and Imaging • Imaging Devices	Ch. 2,3 App. A	#2
3	9/22	• Image Measurements and Refinements • Object Space Coordinate Systems	Ch. 4,5	#3
4	**9/29**	• **Vertical Photographs**	**Ch. 6**	**#4**
5	10/6	• Stereoscopic Viewing • Stereoscopic Parallax	Ch. 7,8	#5
6	**10/13**	• **Elementary Methods of Planimetric Mapping**	**Ch. 9**	
7	10/20	• Tilted and Oblique Photographs • Review for Midterm	Ch. 10	#6
8	**10/27**	• **Midterm Exam**		
9	11/3	• Analytical Photogrammetry • Topographic Mapping and Spatial Data Collection	Ch. 11,12,13	
10	11/10	• Digital Image Processing	Ch. 15	
11	11/17	• Project Planning	Ch. 18	#7
12	**11/22**	• **GEOD Corp. (Thursday Classes Meet)**		
13	12/1	• Laser Scanning Systems • Airborne LiDAR	Ch. 14	
14	12/8	• Digital Resampling • Drones (optional) • Review for Final		
15	**12/15**	• **Reading Day (No Class)**		
16	**12/22**	• **Final Exam**		