



Navajo Technical University

<http://navajotech.edu>

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Course Title: Remote Sensing
Course #: GIT 202-1

Credit Hours: 3.0
Semester: Spring 2022
Cap: 10

Faculty: Nsalambi V. Nkongolo, PhD

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Office: Tech 325

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Office Hours: MW 9:00-11:00 am; TR: 10:00-12:00 pm Cell: (573) 292-7783

Preferred Communication (email and/or text; will respond within 24 hours)

Class Location: Tech 325

Class Meeting Times: MW 2:00-3:20 pm

Required Materials:

Laptop: Every student is required to have a laptop

Textbooks: Remote Sensing of the Environment

Tools: Jump drive (to save your work)

Lab Fee (if applicable): None

Mission Statement

Navajo Technical University's mission is to provide University readiness programs, certificates, associate, baccalaureate, and graduate degrees. Students, faculty, and staff will provide value to the Diné community through research, community engagement, service learning, and activities designed to foster cultural and environmental preservation and sustainable economic development. The University is committed to a high quality, student-oriented, hands-on-learning environment based on the Diné cultural principles: *Nitsáhákees, Nahátá, Īna, Siihasin.*

Course Description

This course introduces students to the fundamental principles of remote sensing, with specialized applications in the new technologies and GIS. The focus of the course is to help students understand the current state of knowledge in remote sensing and its applications.

Course Outcomes	Course Measurements
A strong understanding of basic remote sensing concepts and applications	Complete reading assignments, homework assignments, exams, projects, and quizzes. Lab assignments and projects are designed to give you practical experience, develop
A strong understanding of the general characteristics of the electromagnetic spectrum and electromagnetic energy.	

A strong understanding of remote sensing platforms and sensors	core GIS skills, and experience course material firsthand. Exams and quizzes test your knowledge and subject mastery. Critical thinking questions require you to solve practical problems and apply what you have learned.
A strong understanding of remotely sensed data	
A strong ability to think spatially	
A strong ability to integrate remote sensing, GIS and cartography in a single project	
A strong ability to make decision and communicate with maps and remotely sensed data	
A strong ability to use Remote Sensing and GIS Software	
A strong knowledge of remotely sensed data characteristics and methods of data acquisition, storage, and manipulation.	

Course Activities

Week	Date	Chapters		Assignments	Quizzes
1	Jan 19	Ch 1: History and Scope of Remote Sensing	I. Foundations		
		Ch 2: Electromagnetic Radiation			
2	Jan 24 Jan 24	Ch 3: Mapping Cameras	II. Image Acquisition		
3	Feb 2	Ch 4: Digital Imagery		Lab 1: Display and Inspection of Image Data	Quiz 1
4	Feb 7 Feb 9	Ch 5: Image Interpretation		Lab2: Image Enhancement	
5	Feb 14 Feb 16	Ch 6: Land Observation Satellites			
6	Feb 23 Feb 28	Ch 7: Active Microwave			
7	Marc 2	Ch 8: Lidar			Quiz 2
	March 7-11: Mid Term				
	March 14-18: Spring Break				
7	March 21	Ch 9: Thermal Imagery			
8	March 23	Ch 10: Image Resolution	III. Analysis		
8	March 28			Lab 3: Unsupervised Classification (Cluster Analysis)	

		Ch 11: Preprocessing		Lab 5: Supervised Classification	Quiz 3
9	April 4	Ch 12: Image Classification			
10	April 6	Ch 13: Field Data		Lab 5: Combining Separate Image Files into a Single file	
				Lab 6: Overlay Shape Files on Image Window	
11	April 11	Ch 14: Accuracy Assessment		Lab 7: Selecting Areas and the Coordinate View	
12	April 13	Ch 15: Hyperspectral Remote Sensing		Lab 8: Creating Vegetation Indices Images	
		Ch 16: Change Detection		Lab 9: Handling HDF Formatted Image Files	
13	April 18	Ch 17 & 18: Plant Sciences and Earth Science	IV. Applications	Lab 10: Visualizing Growing Degree Day (GDD) Images	
14	April 20	Ch 19 & 20: Earth Sciences			
15	April 23	Ch 19: Hydrospheric Sciences			
16	April 27	Ch 20: Land Use			
					Quiz 4
	May 2	Ch 21: Global Remote Sensing			
	May 4	Project/Field Data			
	May 10	Final Exam			
	May 12	Grades due			

Grading Plan

Homework	20%	A = 100 - 90%
Mid-term	20%	
Final Exam	25%	B = 89 - 80%
Project	10%	
Quizzes	20%	C = 79 - 70%
Class Participation	3%	D = 69 - 60%
Portfolio:	2%	F < 60%

Grading Policy

Each student must do his or her own homework and case studies. Discussion among students on homework and cases is encouraged for clarification of assignments, technical details of using software, and structuring major steps of solutions - especially on the course's Web site. Students must do their own work on the homework and exam. Cheating and Plagiarism are strictly forbidden. Cheating includes but is not limited to: plagiarism, submission of work that is not the student's own, submission or use of falsified data, unauthorized access to exam or assignment, use of unauthorized material during an exam, supplying or communicating unauthorized information for an assignment or exam.

Participation

Students are expected to attend and participate in all class activities- as listed above, as it **is 3% of the grade**. Points will be given to students who actively participate in class activities including field trips, laboratories, and ask questions of guest speakers and other presenters.

Cell phone and headphone use

Please turn cell phones off or place them on silence or vibrate mode **before** coming to class. Also, answer cell phones **outside of class** (not in the classroom). Exercising cell phone use courtesy is appreciated by both the instructor and classmates. Headphones are to be removed before coming to class.

Attendance Policy

Students are expected to regularly attend all classes for which they are registered. A percentage of the student's grade will be based on class attendance and participation. Absence from class, regardless of the reason, does not relieve the student of his/her responsibility to complete all course work by the required deadlines. Furthermore, it is the student's responsibility to obtain notes, handouts, and any other information covered when absent from class and to arrange to make up any in-class assignments or tests if permitted by the instructor. Incomplete or missing assignments will necessarily affect the student's grades. Instructors will report excessive and/or unexplained absences to the Counseling Department for investigation and potential intervention. **Instructors may drop students from the class after three (3) absences unless prior arrangements are made with the instructor to make up work and the instructor deems any excuse acceptable.**

Study Time Outside of Class for Face-to-Face Courses

For every credit hour spent in a class, a student is expected to spend two hours (2) outside of class studying the course materials.

Study Time for Hybrid or Blended Courses

For a hybrid or blended course of one (1) credit hour, a student is expected to spend three (3) hours per week studying the course materials.

Study Time for Online Courses

For an online course of one (1) credit hour, a student is expected to spend four hours (4) per week studying the course materials.

Academic Integrity

Integrity (honesty) is expected of every student in all academic work. The guiding principle of academic integrity is that a student's submitted work must be the student's own. Students who engage in academic dishonesty diminish their education and bring discredit to the University community. Avoid situations likely to compromise academic integrity such as: cheating, facilitating academic dishonesty, and plagiarism; modifying academic work to obtain additional credit in the same class unless approved in

advance by the instructor, failure to observe rules of academic integrity established by the instructor. **The use of another person's ideas or work claimed as your own without acknowledging the original source is known as plagiarism and is prohibited.**

Diné Philosophy of Education

The Diné Philosophy of Education (DPE) is incorporated into every class for students to become aware of and to understand the significance of the four Diné philosophical elements, including its affiliation with the four directions, four sacred mountains, the four set of thought processes and so forth: Nitsáhákees, Nahát'á, Íina and Siih Hasin which are essential and relevant to self-identity, respect and wisdom to achieve career goals successfully.

Students with Disabilities

The Navajo Technical University and the School of Science are committed to serving all enrolled students in a non-discriminatory and accommodating manner. Any student who feels he/she may need an accommodation based on the impact of disability or needs special accommodations should inform NTU in accordance with the procedures of the subsection entitled "Students with Disabilities" under Section 7: Student Support Programs, NTU Student Handbook.

Final Exam Date: May 10, 2022