University of Arkansas - Fort Smith
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General Syllabus

GEOS 23403 Remote Sensing

Credit Hours: 3 Lecture Hours: 2 Lab Hours: 2

Prerequisite(s): GEOS 22203 Raster and 3D Spatial Analysis

Effective Catalog: 2021-2022

I. Course Information

A. Catalog Description

An in-depth discussion of applied remote sensing using UAS in agricultural and industrial applications. Basic remote sensing problems and techniques are presented.

B. Additional Information

This course continues the student's introduction to remote sensing. Hyperspectral imaging and LiDAR remote sensing are discussed. A detailed working discussion of spectral characteristics and responses of materials will be presented. Students will learn about advanced global navigation systems and their applications to remote sensing. In-situ calibration techniques are covered, and post processing of data for incorporation into GIS databases is demonstrated.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Use remote sensing tools.
2. Compare spectral spatial measurement systems used in remote sensing.
3. Distinguish error sources in remote sensing.
4. Demonstrate in-situ calibration techniques for remote sensing with hyperspectral- and LiDAR-based systems.
5. Demonstrate hyperspectral and LIDAR mission flight and data processing.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills
Critical Thinking - Students will identify problems/issues and develop solutions/analysis in agricultural and industrial applications to trouble-shoot and develop solutions.
Quantitative Reasoning - The student will develop spatial analysis and geo-referencing to apply appropriate solutions to outcomes.

Communication Skills (written and oral)
Students will communicate proficiently. The student will demonstrate the ability to read and comprehend information through application of theoretical information obtained from course written materials to practical application.

III. Major Course Topics

A. Introduction to Remote Sensing
B. Spectral characteristics of materials
C. High-order positioning systems
D. Challenges and limitations of UAS in remote sensing
E. Data collection and geo-referencing
F. Sources of error and calibration
G. Agricultural remote sensing with hyperspectral helicopter
H. Infrastructure remote sensing with LiDAR
I. Processing hyperspectral imagery and LiDAR data