REMOTE SENSING (SUR 4380)

Instructor: Scot E. Smith, Professor, Geomatics Program, School of Forest Resources and Conservation

Office: 301 Reed Lab, tele: 392 4990, e-mail: sesmith@ufl.edu Office Hours: 1:00-3:00 MWF

Text: Remote Sensing and Image Interpretation by Lillesand, Kiefer and Chipman, 6th ed, Wiley and Sons, 2008.

Course website: \\ad.ufl.edu\ifas\SFRC\Private\Geomatics\Courses

Topics: Remote sensing systems, ground truthing procedures, air photo interpretation, satellite image processing and classification, radar imagery, applications of remotely-sensed imagery, remote sensing and geographic information systems.

Goal: The goal of this course is to provide students with an understanding of the scientific and engineering principles behind remote sensing and to provide an understanding of the state-of-the-art of remote sensing.

Objectives of Course: 1). provide an understanding of the principles of electromagnetic radiation pertaining to remote sensing. 2). provide an understanding of instruments currently used in remotely sensing and their appropriate application. 3). demonstrate computer hardware and software used in remote sensing.

TOPICS

Fundamentals of the Electromagnetic Spectrum
-energy sources and radiation principles
-energy interactions in the atmosphere
-energy interactions with Earth

Photographic systems - silver halide
-elements of photography
-film types (black and white, color, color infrared)
-formats and scale
-cameras (terrestrial, aerial, space)

Photographic Systems - digital
-Elements of digital cameras
-formats
-storage and manipulation of data

Applications of photographic products
-topographic and planimetric mapping
-environmental

Multispectral Scanners
-equipment: terrestrial, airborne, satellite
-resolution
-rectification of imagery
-thermal scanners
-principles of thermal infrared radiation
-radiant vs kinetic temperature

Application of Multispectral Scanner Imagery
-base mapping
-environmental
-natural resources

Active Remote Sensing
-resolution
-azimuth
-range
-terrestrial-based systems
-ground-penetrating radar
-airborne systems
-space-based systems
- LiDAR

Applications of Active Systems
-terrain analysis
-pollution detection and monitoring
-moisture assessment
-target recognition

Digital Image Processing
-image formats
-pre-processing
-radiometric correction
-geometric correction
-post-processing
-enhancement
-classification
-accuracy assessment

Course Grading Policy: Grades will be determined by equally-weighted:

- Laboratory exercises and quizzes
- Final examination (comprehensive)
- Mid-Term examination (March 3rd)
- Final Project