DD-1601-0033

INTRODUCTION TO REMOTELY SENSED IMAGERY/GEOGRAPHIC INFORMATION SYSTEMS

Course Number: 4M/41-712.

Location: National Imagery and Mapping College, Fort Belvoir, VA.

Length: 2 weeks (80 hours).

Exhibit Dates: 10/96–5/08.

Learning Outcomes: Upon completion of the course, the student will have a working knowledge of remote sensing and geographic information systems (GIS). From a remote sensing perspective, the student will describe the fundamentals of the electromagnetic spectrum, reflectance of electromagnetic radiation from earth surface features, spectral response curves, sensor resolution, and current and planned remote sensing platforms. The student will also perform image manipulations, including multispectral image interpretation, image enhancement, geometric correction, accuracy assessment, data merging, image annotation, and change detection. From a GIS perspective, the student will apply fundamental GIS concepts, including various data models and approaches to spatial analysis. The laboratory portions of the class provide the student with a basic application of several standard commercial software products, specifically ERDAS Imagine, ESRI's Arc/Info, and Arc View for processing GIS and remotely-sensed data.

Instruction: The course is a balanced blend of lecture and hands-on laboratory exercises. Detailed treatment of remote sensors and platforms leads to a logical implementation of image classification for terrain characterization. The use of image-derived data sets in GIS analysis follows the discussion of GIS data models and structures. The course is a blend of basic data collection and processing from remotely-sensed sources with the latter part devoted to manipulation of spatial data in a GIS. Topics for the remote sensing section include basics of the electromagnetic spectrum; spectral reflectance curves; remote sensing platforms, including Landsat, SPOT, and planned satellites; multispectral image interpretation; image enhancement; data import; image mosaicking; raster geometric correction; terrain characterization from both supervised and unsupervised methods; accuracy assessment; data merging; image annotation; and change detection. Topics in the GIS section include end-to-end mapping; data models and data structures; and spatial analysis, including overlay, connectivity, reclassification, spatial buffering, and image arithmetic. Both vector and raster GIS approaches are covered with laboratory implementations in Imagine, Arc/Info, and Arc View.

Credit Recommendation: In the upper-division baccalaureate degree category, 3 semester hours in remote sensing or geographic information systems (GIS) (1/99)(1/99).