NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
GIS 255 – EXPLORING OUR EARTH: INTRODUCTION TO REMOTE SENSING (3 CR.)

Course Description

Introduces material to understand the fundamental physical and mathematical principles and techniques of Remote Sensing. Introduces how each part of the electromagnetic spectrum is used to gather data about Earth. Describes limitations imposed by satellites, aircraft, and sensors. Surveys various methods to access and apply Earth observation/Remote Sensing data. Teaches students to use Remote Sensing software to process and manipulate Landsat, SPOT, photographic, and other imagery in a hands-on approach to Remote Sensing analysis. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

General Course Purpose

This course is intended to develop a basic working knowledge of remote sensing for students with intermediate to advanced skills in GIS. During conduct of the course, students become familiar with the principles underlying satellite observations of the Earth by optical and infrared sensors. Students learn techniques for extracting geophysical information from remote sensor observations. The course prepares students for more advanced GIS and RS study. Upon course completion, successful students will also be ready for employment at the intermediate-level in GIS, or for an entry-level RS position. The course provides an opportunity to develop the complex skills and abstract thinking required to successfully solve real-world problems in this field.

Course Prerequisites/Co-requisites

Prerequisite: GIS 200

Course Objectives

Upon completing the course, the student will be able to:

- Describe basic physics concepts on which remote sensing is based (i.e. Electromagnetic Spectrum, etc.)
- Describe the fundamentals of Photogrammetry
- Select appropriate data set for remote sensing application based on spectral, temporal, radiometric and spatial resolution.
- Describe characteristics of passive and active remote sensing systems (such as multispectral, LiDAR and Radar)
- Perform basic remote sensing workflows to solve problems (such as acquiring data, feature extraction, change detection, pre- and post-processing, create composite images and image classification).
- Describe future trends in remote sensing
- Apply basic concepts, methods and uses of accuracy assessment and groun- truthing to the results of remote sensing workflows
- Interpret, analyze and summarize results of a remote sensing workflow

Major Topics to be Included

- physical principles on which remote sensing is based
- history and future trends
- sensors and their characteristics
- image data sources
- image classification, interpretation and analysis techniques