South Central College

GIS 2845 Introduction to Remote Sensing

Course Outcome Summary

Course Information
Description
This course will introduce students to the basic concepts and fundamentals of remote sensing. Digital image processing techniques and aerial photo interpretation will be reviewed and applied to practical problems through the use of various lab activities. (Prerequisite: None)

Total Credits 4
Total Hours 96

Types of Instruction
Instruction Type Credits/Hours
Lab 2/64
Lecture 2/32

Pre/Corequisites
None

Institutional Core Competencies
Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Discuss basic remote sensing theories
   Learning Objectives
   Describe how remote sensing is applied in various professions
   Differentiate between the various means of collecting remotely-sensed images
   Explain the reasons for using both passive and active sensors for acquiring data
   Describe the various methods for interpreting remotely-sensed data

2. Examine how aerial photographs are acquired
   Learning Objectives
Compare the components of analog aerial cameras to those of digital aerial cameras
Describe the basic geometry of a vertical aerial photograph
List the advantages and disadvantages of digital aerial photographs

3. **Utilize image interpretation techniques to obtain information about surface features**
   
   **Learning Objectives**
   
   - Calculate photographic scale
   - Examine the distinguishable elements found in all aerial images
   - Discuss the use of stereo photos
   - Transfer remotely sensed data between multiple formats

4. **Examine the Electromagnetic Radiation Spectrum (EMR)**
   
   **Learning Objectives**
   
   - Identify the major divisions of the EMR spectrum
   - Identify the various ways in which EMR interacts with both the atmosphere and earth's surface
   - Distinguish between objects that absorb and objects that reflect EMR

5. **Describe the major satellite imaging platforms and their instruments**
   
   **Learning Objectives**
   
   - Describe why satellites take certain paths of orbit
   - Compare spatial and spectral resolutions between images
   - Identify the types of data provided by various satellites
   - Utilize data archives to research and download satellite images

6. **Manipulate digital images used in remote sensing**
   
   **Learning Objectives**
   
   - Differentiate between raster file formats
   - Apply various band combinations to effectively display digital images
   - Apply image enhancement techniques to improve visual appearance of digital images
   - Identify software programs available for interpreting and manipulating data

7. **Acknowledge the importance of metadata**
   
   **Learning Objectives**
   
   - Evaluate metadata software packages
   - Identify metadata key components
   - Determine metadata fields to data relationships
   - Develop image metadata

8. **Preprocess images**
   
   **Learning Objectives**
   
   - Discuss atmospheric correction for imagery
   - Describe radiometric processing
   - Calculate radiances from digital numbers
   - Calculate top of atmosphere reflectance
   - Describe image data processing standards

9. **Perform image classifications**
   
   **Learning Objectives**
   
   - Differentiate between informational and spectral classes
   - Perform unsupervised classifications
   - Perform supervised classifications
   - List the advantages, disadvantages, and limitations of classification methods
   - Develop an ideal sequence for selecting training data

10. **Perform change detection**
    
    **Learning Objectives**
    
    - Describe the advantages and disadvantages of performing multitemporal change detection
    - Review the necessary preprocessing steps needed to perform change detection
11. **Prepare for delivery of end data**

   Learning Objectives
   - Determine project deliverables
   - Develop efficient workflow diagrams
   - Adhere to project timelines
   - Perform to highest quality of work standards

12. **Describe end user requirements**

   Learning Objectives
   - Develop data for use in a GIS
   - Provide efficient accessibility to data
   - Research end user requirements

13. **Identify how Remote Sensing is applied in various industries**

   Learning Objectives
   - Discuss remote sensing case studies
   - Identify employment opportunities for Remote Sensing professionals
   - Review industry data standards

**SCC Accessibility Statement**

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