



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 work flow diagrams  
Adhere to project time lines  
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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Additional information and forms can be found at: [www.southcentral.edu/disability](http://www.southcentral.edu/disability)

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