

GEO 3840 - Remote Sensing: Principals & Methods

GTCM (2014)			
Student Learning Objective	Tier Number	Subdivision	Comments
Unit 1: Foundations of Remote Sensing			
Describe the basic physics concepts on which remote sensing is based (i.e. Electromagnetic Spectrum, blackbody effect, scattering, etc.)	Tier 4	4.1: Remote Sensing and Photogrammetry; Geospatial Data	Units: What is Remote Sensing; SLO 1,4,6
Unit 2: Imagery Systems			
Describe the four major types of image resolution.	Tier 4	4.1: Remote Sensing and Photogrammetry; Geospatial Data	Units: Satellites and Sensor Platforms; SLO 4,6
Describe the characteristics of passive image acquisition systems.	Tier 4	4.1: Remote Sensing and Photogrammetry; Geospatial Data	
Describe the characteristics of active image acquisition systems.	Tier 4	4.1: Remote Sensing and Photogrammetry; Geospatial Data	
Identify examples of both passive and active sensors.	Tier 4	4.1: Remote Sensing and Photogrammetry; Geospatial Data	
Identify some key geospatial applications using remote sensing systems.	Tier 4	4.1: Remote Sensing and Photogrammetry; Geospatial Data	
Demonstrate an understanding of how to select the appropriate imagery systems for a geospatial application.	Tier 2, Tier 3, Tier 4, Tier 5	2.4: Geography (Geographic Perspectives); 3.4: Problem Solving/Decision Making; 4.1: Core Geospatial Abilities and Knowledge (Data Quality, Remote Sensing and Photogrammetry, Geospatial Data); 5.1 Positioning and Data Acquisition (Critical Work Functions)	
Unit 3: Image Processing & Analysis			
Describe how to assess the quality of imagery to determine its suitability for a geospatial application (i.e., image statistics)	Tier 2, Tier 4	2.3: Mathematics (statistics); 4.1: Remote Sensing and Photogrammetry; Geospatial Data	Units: Remote Sensing and Image Classification (SLO 3,5,7,8); Remote Sensing Workflows (SLO 3,5,8)
Explain the characteristics and applications of the different image "preprocessing" steps (e.g., radiometric correction, geometric correction, image enhancement, and data fusion).	Tier 4, Tier 5	4.1: Remote Sensing and Photogrammetry; Geospatial Data; 5.2: Analysis and Modeling	
Describe the different methods to extract information from imagery (i.e., image classification and change detection)	Tier 4	4.1: Remote Sensing and Photogrammetry; Geospatial Data	
Describe the methods used for accuracy assessment (positional and thematic) of output data	Tier 2, Tier 4	2.3: Mathematics (statistics); 4.1: Remote Sensing and Photogrammetry; Geospatial Data	
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).	Tier 2, Tier 3, Tier 4, Tier 5	2.3: Mathematics (statistics); 3.5: Working with Tools and Technology (Selecting tools); 4.1: Remote Sensing and Photogrammetry; Geospatial Data 5.2: Analysis and Modeling (Critical Work Functions)	
Unit 4: Introduction to Remote Sensing Field Data			
Describe what type of ground reference data is needed to support remote sensing workflows	Tier 2, Tier 4	2.4 Geography (Geographic Skills) 4.1: Positioning Systems, Remote Sensing and Photogrammetry	
Describe various field sampling strategies	Tier 4, Tier 5	4.1: Remote Sensing and Photogrammetry; 5.2: Analysis and Modeling	
Collect remote sensing in situ field data using field instruments (e.g., GPS receivers, UAVs, cameras, etc.).	Tier 3, Tier 4	3.3: Planning and Organizing; 3.5: Working with Tools and Technology	
Unit 5: Final Project			
Demonstrate basic proficiency in classifying digital imagery that apply a remote sensing workflow, to include preprocessing and analysis steps.	Tier 3, Tier 4, Tier 5	3.3: Planning and Organizing; 3.5: Working with Tools and Technology (Selecting tools); 4.1: Remote Sensing and Photogrammetry; Geospatial Data	
Apply basic concepts, methods of accuracy assessment and ground referencing to the results of a remote sensing workflow	Tier 4, Tier 5	4.1: Remote Sensing and Photogrammetry; Geospatial Data	
Interpret, analyze and summarize results of a remote sensing workflow in a final report.	Tier 2, Tier 4, Tier 5	2.2: Writing; 2.6: Communication - Listening and Speaking; 4.1: Remote Sensing and Photogrammetry; Geospatial Data	