

Spring 1-1-2020

SET 203-002: Introduction to Remote Sensing Science and Technology

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SET 203 - Introduction to Remote Sensing Science & Technology

Spring 2020 Schedule

Week	Date	Topic
1	01/23/2020 (Thursday) 3:30 PM	Lecture#1 Course Overview, History and Scope of Remote Sensing <ul style="list-style-type: none"> ▪ Definitions ▪ Milestones in the history of remote sensing ▪ The remote sensing processes ▪ Key concepts of remote sensing
2	01/30/2020 (Thursday) 3:30 PM	Lecture#2 Electromagnetic Radiation <ul style="list-style-type: none"> ▪ The electromagnetic (EM) spectrum ▪ Radiation laws ▪ Interactions with the atmosphere ▪ Interactions with surfaces ▪ Summary: Three models for remote sensing
3	02/06/2020 (Thursday) 3:30 PM	Lecture#3 Sensor Overview <ul style="list-style-type: none"> ▪ Resolutions ▪ Across-track vs. along-track scanning ▪ Satellite orbits ▪ The Landsat legacy
4	02/11/2020 (Tuesday) 3:30 PM	In-class Assignment#1 Exploring Sensor Characteristics and Data Availability using Online Resources
5	02/20/2020 (Thursday) 3:30 PM	Lecture#4 Multi- & Hyperspectral Remote Sensing <ul style="list-style-type: none"> ▪ Digital multispectral data collection ▪ Multispectral imaging ▪ Spectrometry ▪ The image cube ▪ Spectral mixing
6	02/27/2020 (Thursday) 3:30 PM	In-class Assignment#2 Image Acquisition through USGS Earth Explorer and Interpretation of Landsat Time-Series Imagery
7	03/05/2020 (Thursday) TBD	MIDTERM EXAM
8	03/10/2020 (Tuesday) 3:30 PM	Lecture#5 Thermal Infrared Remote Sensing <ul style="list-style-type: none"> ▪ Heat, temperature, energy, and flux ▪ Emissivity ▪ Blackbodies vs. graybodies ▪ Geometric distortions in thermal images ▪ Example: Analysis of the urban heat island effects
9	03/17/2020 (Tuesday) 3:30 PM	In-class Assignment#3 Interpretation of Aerial Thermal Infrared Imagery
10	03/26/2020 (Thursday) 3:30 PM	Lecture#6 Active Microwave (Radar) Remote Sensing <ul style="list-style-type: none"> ▪ Wavelength and penetration of radar signals ▪ Polarization

		<ul style="list-style-type: none"> ▪ <i>Side-looking radar systems</i> ▪ <i>Radar geometry and resolutions</i> ▪ <i>Fundamentals of relief displacement, foreshortening, layover, and shadows</i> ▪ <i>Speckles</i> ▪ <i>Synthetic Aperture Radar (SAR)</i> ▪ <i>Satellite SAR missions</i>
11	04/02/2020 (Thursday) 3:30 PM	In-class Assignment#4 Interpretation of Radar Imagery
12	04/09/2020 (Thursday) 3:30 PM	Lecture#7 LiDAR Remote Sensing <ul style="list-style-type: none"> ▪ <i>Laser scanning & altimetry</i> ▪ <i>Airborne LiDAR systems</i> ▪ <i>LiDAR returns and footprints</i> ▪ <i>Full waveform LiDAR</i> ▪ <i>Digital Elevation Model (DEM)</i>
13	04/16/2020 (Thursday) 3:30 PM	In-class Assignment#5 LiDAR Classification for Bare Earth and Building Extraction
14	04/23/2020 (Thursday) 3:30 PM	Lecture#8 Guest Lecture on Unmanned Aerial Vehicles (UAVs) <ul style="list-style-type: none"> ▪ <i>History of UAVs</i> ▪ <i>Fundamentals of UAV operations</i> ▪ <i>Aviation regulatory and Certificate of Authorization (COA) process</i> ▪ <i>Mission planning</i> ▪ <i>Ground Control Points (GCPs)</i> ▪ <i>UAV data processing</i> ▪ <i>Applications</i>
15	04/30/2020 (Thursday) 3:30 PM	Fieldwork GCPs Collection using Handheld GPS and Data Analysis
16	05/14/2020 (Thursday) TBD	<i>FINAL EXAM</i>