This course presents an introduction to remote sensing and raster based image processing of satellite-derived images of the Earth’s surface. Satellite remote sensing is a fast-growing discipline, with applications to land surface change, environmental monitoring, oceanography, meteorology, and many other fields. The first five weeks emphasize the physics of visible/near-infrared, thermal, laser, hyperspectral and radar technologies. The second five weeks emphasize applications. Labs and a Mini-Project emphasize use of ENVI imaging-processing software for manipulation and analysis of digital satellite data. All lectures and labs are taught in the SSC computing facility (2400 Public Policy Building).

Exams will be held in 1261 Bunche Hall.

Grading: 50% Lab, 25% First Exam, 25% Second Exam

Prerequisites: Geography 7


No late labs or exams will be accepted without prior approval of instructor

Students requiring special assistance should contact the UCLA Office for Students with Disabilities. UCLA’s Office for Equity, Diversity, and Inclusion provides resources, events, and information about current initiatives at UCLA to support equality for all members of the UCLA community.

Week 1: T: Introduction to satellite remote sensing
Th: Electromagnetic principles (Ch. 1-2)

Week 2: T: Multi-spectral remote sensing systems (Ch. 7)
Th: (Lab) Introduction to ENVI and multi-spectral images

Week 3: T: Thermal infrared remote sensing and image analysis (Ch. 8, Ch. 5)
Th: (Lab) Thermal infrared imaging

Week 4: T: Microwave and lidar remote sensing (Ch. 9, 10)
Th: (Lab) Synthetic Aperture Radar processing and techniques

Week 5: T: First written exam Tuesday, February 5 in 1261 Bunche Hall
Th: (Lab) Vegetation analysis: unsupervised classification

Week 6: T: Remote sensing of vegetation (Ch. 11)
Th: Remote sensing of water (Ch. 12)

Week 7: T: (Lab) Water resource analysis
Th: Remote sensing of the urban landscape (Ch. 13)

Week 8: T: (Lab) Urban applications
Th: Remote sensing of soils, minerals, geomorphology and topography (Ch. 14)

Week 9: T: (Lab) digital elevation models
Th: (Lab) mini-projects

Week 10: T: TBA/catch-up
Th: Second written exam Thursday, March 14 in 1261 Bunche Hall

Mini-Projects Due by 5:00 p.m. Wednesday, March 20