Review List for the Final Examination

Chapter 8

Thermal versus reflective infrared regions
Conduction, convection, and radiation
Thermal infrared atmospheric windows
Radiant versus kinetic temperature
Blackbody versus gray body
Stefan-Boltzmann Law
Wien's Displacement Law
Kirchoff Radiation Law
Emissivity
Thermal properties of rerrain
    Thermal conductivity
    Thermal capacity
    Thermal inertia
    Apparent thermal inertia
Diurnal temperature cycle
    Thermal crossovers
Geometry of across-track thermal data
    Ground swath width (gsw)
    Ground resolution cell size (D)
    One-dimensional relief displacement
    Tangential scale distortion
Thermal radiometers
Thermal infrared multispectral scanners
FLIR
Applications of thermal remote sensing

Chapter 9

Microwave regions for remote sensing
Advantages of microwave remote sensing
Active versus passive radar imaging
Radiometer versus scanner
Side-Looking Airborne Radar (SLAR)
Comparison of radar and MSS mechanisms
Pulse length (duration)
Radar depression and incident angles
Local incident angle and radar returns
Polarization (Like- and Cross-Polarized)
Range direction (look direction)
Azimuth direction
Determination of slant range
Determination of range resolution
Determination of azimuth resolution
Relation between slant and ground ranges
Real aperture vs. synthetic aperture radar
Doppler effect and its use in SAR
Backscatter
    Radar backscatter coefficients
Slant-range scale distortion
Near range and far range
Radar relief displacement
    Foreshortening
    Layover
    Radar Shadow
Surface roughness & its influencing factors
    Modified Rayleigh criteria
    Diffuse, specular, and corner reflectors
Radar bands and penetration
Complex Dielectric Constant
Cardinal effect
Soil, vegetation, and water responses
Speckle and multiple-look processing
SIR-A, SIR-B and their applications
SIR-C/X-SAR and Its characteristics
RADARSAT and its characteristics
ERS-1 and its AMI characteristics
Passive microwave remote sensor
LIDAR and IFSAR and their applications

Chapter 10

Spectral characteristics of vegetation
    Reflectance, transmittance, and absorption
Dominant factors controlling leaf reflectance
    Chlorophyll *a* and *b*
    Mesophyll cell structure
    Water content
Leaf additive reflectance
Temporal characteristics of vegetation
    Phenological cycles of vegetation
    Vegetation reflectance changes over time
    Effect and utility of plant phenology
Vegetation indices (SR, NDVI, SAVI)
Landscape patterns and patch matrics
    Dominance
    Contagion
    Fractal dimension

Chapter 11

Remotely sensible hydrologic variables
Pure surface water spectral characteristics
    Water surface radiance
    Subsurface volumetric radiance
    Bottom radiance
Spectral response of water with pollutants
    Suspected minerals (inorganic)
    Chlorophyll (organic)

Water penetration at different wavelengths
Remote sensing of
- Ocean color
- Temperature
- Clouds and snow

Chapter 12

Remote sensing supported urban applications
GIS data layers for urban management
- Foundation spatial database
- Thematic framework data

Urban/suburban Resolution considerations
- Temporal (developmental cycle)
- Spectral
- Spatial
  - NIIRS Criteria
  - Area weighed average resolution
  - Nominal spatial resolution

Land use and land cover classification schemes
APA's "Land-based classification standard"
USGS's LULC classification system
- Level I through IV
- Remote sensor data characteristics

Sample urban applications