STAT 6530 – Introduction to Spatial Statistics

TENTATIVE SYLLABUS

2 semester hour course

Prereqs: Stat 645 or Stat 6450 or Stat 6950 or GEOG 883.02x, or permission of instructor

Exclusions: Stat 631 or Stat 821 or Stat 821x


Conversion Note: Converted from a 3 quarter hour course

Course Description

This course provides an introduction to spatial statistical methods. Geostatistical data, regional data, and spatial point patterns are studied using the viewpoint that these are realizations from random processes. Among the topics considered are spatial covariance functions, variograms, kriging, spatial (simultaneous and conditional) autoregressive models, intensity function, and K function. Properties of these quantities and their inference will be discussed. Applications will be used to illustrate the methodologies.

List of Topics

1. Introduction
2. Spatial random processes
3. Geostatistical data
4. Covariance functions
5. Variograms
6. General linear model
7. Interpolation and spatial prediction
8. Kriging
9. Geostatistical simulation
10. Regional data
11. Analysis of counts and rates
12. Spatial simultaneous autoregressive models
13. Spatial conditional autoregressive models
14. Spatial point patterns
15. Intensity function and K function