
SUMMER 2002
DAY COURSE

Instructor: Dr. C. Dean & Dr. F.He

Prerequisite:

Permission of instructors.

Audience:

Graduate students in statistics, geography, geology, biological sciences, rem and environmental science.

Assessment:

There will be three projects through the term and a final project at the end of term.

Materials:

Teaching will rely on course notes, handouts and assigned readings.

Computing:

Statistical package S-PLUS will be the major computing tool for the course.

It is highly desirable that students know the basics of the package although introductory material on S-PLUS will be provided.

References:

- Quantitative spatial analysis (Robin M. Reich and Richard Davis, Colorado State University, unpublished, 2000)
- Statistics for spatial data (Noel Cressie, Wiley, 1993)
- Spatial statistics (Brian D. Ripley, Wiley, 1981)
- Statistical analysis of spatial point patterns (Peter J. Diggle, Academic Press, 1983)
- An introduction to applied geostatistics (Edward H. Isaaks and R.Mohan Srivastava, Oxford University Press, 1989)

Course Description:

The primary objective of the course is to consider basic techniques in analyzing and interpreting spatially dependent data. These include spatial point patterns, geostatistical data, and regular/irregular lattice data. Examples from ecology, forestry and epidemiology will be used throughout the course.

The following topics will be covered:

1. Introduction
2. Exploratory spatial data analysis
3. Spatial point pattern analysis and modeling (quadrat counts, distance sampling, mapped point pattern analysis, Ripley's K function, and point pattern modeling)
4. Geostatistical models (spatial autocorrelation, variograms, kriging, sampling design)
5. Lattice models (neighborhood analysis, spatial regression models)
6. Special topics (fractal and scaling analysis, wavelet analysis, Markov Chain Monte Carlo)

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.
