

Applied Spatial Statistics

STAT 5410/6410

Utah State University
Fall 2009

Lecture: MF 11:30 AM / ENGR 202

Lab: W 11:30 AM / GEOL 310

Instructor: Dr. Mevin Hooten
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Office Hours: Mon/Wed 12:30-2:00 PM
Text: *Statistical Methods for Spatial Data Analysis*
by Schabenberger and Gotway
Prerequisite: STAT 3000
Computing: R Statistical Computing Language
Grading: 2 Exams (20% each) [6410 only]
1 Final Project (20%)
Homework/Labs (40%) [5410: 80%]

Notes:

- Homework and Computer labs are critical for understanding and being able to apply the content presented in the course. Homework and Lab reports are due at the beginning of the course meeting time on the due date specified.
- The prerequisite for this course is officially STAT 3000. Thus, a working knowledge of basic statistical modeling methods is absolutely required. Spatial statistics is highly useful in nearly every scientific field, however, a proper application of spatial statistics requires a significant increase in methodological knowledge. With only the basic prerequisite, you will need to be highly motivated in order to succeed in this course.

- **Essential Skills:**
 - Good understanding of random variables and probability distributions.
 - Calculus (differentiation and integration).
 - Statistical modeling (linear models mostly... Regression/ANOVA).
 - Computer programming concepts (loops, boolean, file management and data structures, etc...).
 - Linear algebra (matrix and vector operations).

Course Topics:

- Brief overview of Spatial Statistics
- Review of Essential Statistical Concepts
- Introduction to Spatial Random Processes
- Introduction to Spatial Point Pattern Analysis
- Introduction to Geostatistics
- Introduction to Lattice Data Analysis
- Advanced Topics (time permitting)

Supplementary Text:

- *Statistics for Spatial Data*, by Noel Cressie
- *Spatial Statistics*, by Brian Ripley
- *Interactive Spatial Data Analysis*, by Bailey and Gatrell

Disabilities:

Reasonable accommodations will be provided for qualified students with disabilities. If a student has a disability that will likely require some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability Resource Center during the first week of the course. Any requests for special considerations relating to attendance, pedagogy, taking of examinations, etc. must be discussed with and approved by the instructor. In cooperation with the Disability Resource Center, course materials can be provided in alternative formats such as large print, audio, diskette, or Braille. The student is responsible for contacting the Disability Resource Center.