Advanced Quantitative Geography (GEO5934), Spring 2008
Monday: 9:30am - noon, Bellamy 35

CONTACT
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Office Hours: By email any time (jelsner@fsu.edu)
Blackboard: https://campus.fsu.edu/webapps/login

SOFTWARE FOCUS: R

COURSE DESCRIPTION
I designed this course for graduate students in geography and related disciplines. It is suitable for students with a solid knowledge of introductory inferential statistics through multiple linear regression. The purpose of this course is to provide an understanding of the various statistical methods used to describe, analyze, and model spatial data. It is assumed that this is a first course in spatial statistical analysis. The course is focused on application and away from statistical theory, but some mathematical formalism is needed to understand the topics. Topics include exploratory spatial data analysis, analysis of lattice data, spatial regression models, geostatistical data analysis and modeling and models, analysis and modeling of spatial point patterns, other topics will include cluster and factor analysis.

OBJECTIVES
There are four objectives of this course. (1) To learn how to apply spatial statistical methods to geographical data, (2) to acquire problem-solving skills with geographical data, (3) to acquire skills in using R for analyzing geographical data, and (4) to interpret results obtained by using methods of spatial statistics. Much of the course time will be devoted to supervised computer lab work.

GRADING & POLICIES
You are responsible for attending class, reading the material, handing in assignments on time, and preparing and presenting a final term project to the class. It is your responsibility to locate the relevant material. Late assignments will be deducted 30 percent. An assignment is late if it is not turned in within 6 days of its due date. You are expected to choose a topic for the term project by March 31, 2008.

GRADING/EVALUATION
Grades are determined by a term project worth 50 percent and homework worth 50 percent.

GRADING STANDARDS
A Outstanding: few, in any, errors/omissions
B Good: only minor errors/omissions
C Satisfactory: minor omissions, at least one major error/omission
D Poor: several major errors/omissions

F Fail: many major errors/omissions
I will use the +/- grading system.

ACADEMIC HONOR CODE
Students are expected to uphold the Academic Honor Code published in The Florida State University Bulletin and the Student Handbook. The Academic Honor System of The Florida State University is based on the premise that each student has the responsibility (1) to uphold the highest standards of academic integrity in the student's own work, (2) to refuse to tolerate violations of academic integrity in the university community, and (3) to foster a high sense of integrity and social responsibility on the part of the university community.

AMERICANS WITH DISABILITIES ACT
Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; (2) bring a letter indicating the need for accommodation and what type. This should be done during the first week of classes.

SYLLABUS CHANGE POLICY
This syllabus is a guide for the course and is subject to change with advanced notice.

OUTLINE
January 7: Review of R, Introduction, Geostatistics lecture.
January 14: Geostatistics lecture, Geostatistics with geoR.
January 21: MLK Day (no class).
January 28: Geostatistics with geoR.
February 4: Geostatistics with ArcMap, Spatial regression with spdep.
February 11: Spatial regression with spdep R package.
February 18: Spatial regression with GeoDa.
February 25: Point pattern analysis lecture.
March 3: Point pattern analysis and modeling with spatstat R package.
March 10: Spring Break.
March 17: Cluster analysis with R.
March 24: Factor analysis lecture.
March 31: Factor analysis with R.
April 7: Other topics? Social network analysis, spatial statistical tools in SAGA?
April 14: Student projects.
Finals week: Student projects.

REFERENCE MATERIAL (will be provided on Blackboard)
Anselin, L., I. Syabri, and Y. Kho, 2004: GeoDa: An Introduction to Spatial Data Analysis, Spatial Analysis Laboratory, Department of Agricultural and Consumer Economics, University of Illinois, Urbana-Champaign [AnselinEtAl2004.pdf].

Anselin, L., 2005: Exploring Spatial Data with GeoDa: A Workbook, Spatial Analysis Laboratory, Center for Spatially Integrated Social Science [GeoDa_Workbook.pdf].

Anselin, L., 2005: Spatial Regression Analysis in R, Spatial Analysis Laboratory, Center for Spatially Integrated Social Science [SpatialRegression_Tutorial_R.pdf].

Baddeley, A., and R. Turner, 2005: spatstat: An R Package for Analyzing Spatial Point Patterns, Journal of Statistical Software, v12 [BaddeleyTurner2005.pdf].

ADDITIONAL REFERENCE MATERIAL

Cressie, N.A.C., 1993: Statistics for Spatial Data, Wiley Series in Probability and Mathematical Statistics, John Wiley & Sons, Inc., New York. A mathematical treatment of spatial data analysis.

Diggle, P.J., 2003: Statistical Analysis of Spatial Point Patterns, Second Edition, Arnold Publishers. An introduction to the concepts and methods of statistical analysis of spatial point patterns.

Fotherhingham, A.S., C. Brunsdon, and M. Charlton, 2000: Quantitative Geography: Perspectives on Spatial Data Analysis, SAGE Publications, London. A survey of spatial data analysis from the perspective of modern geography.

Haining, R., 2003: Spatial Data Analysis: Theory and Practice, Cambridge University Press. The confluence of geographic information science and applied spatial statistics.

Ripley, B.D., 1981: Spatial Statistics, Wiley, New York. A reference book on spatial data analysis.

Waller, L.A., and C.A. Gotway, 2004: Applied Spatial Statistics for Public Health Data, John Wiley & Sons, Inc. An applied treatment of spatial data modeling. If I were to buy just 1 book on spatial statistics, this would be it.