

# GEOG 8102 – Advanced Spatial Data Analysis

Thursday 2:15-5:00pm, 1186 Derby Hall

## Instructor

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Office Hours: Tu Th 1:00-2:00PM, or by appointment

## Course Description

This course focuses on advanced statistical methods for spatially referenced data, including spatial point patterns, geostatistical data, and lattice data. Major topics to be covered include spatial random processes, exploratory spatial data analysis, spatial point pattern analysis, spatial covariance functions, variograms, kriging, spatial autoregressive models, and geographically weighted regression. Computer exercises are designed to help students to gain hands-on experience on the topics presented in lectures. Students are required to present and discuss assigned readings and develop an individual research project that applies spatial statistical methods in geographical problem solving.

## Course Website

The course schedule, announcements, lecture notes, assignments, readings, and other course information will be posted on Carmen (<https://carmen.osu.edu>).

## Prerequisites

GEOG 5100, or consent of instructor. Students should be familiar with basic probability theory, multiple linear regression, and basic linear algebra.

## Required Textbook

Lance A. Waller and Carol A. Gotway (2004). *Applied Spatial Statistics for Public Health Data*. Wiley, New York.

## Reference Books

Bailey, Trevor C. and Anthony C. Gatrell. (1995). *Interactive Spatial Data Analysis*, Prentice Hall.

Roger S. Bivand, Edzer J. Pebesma, and V. Gómez-Rubio (2013). *Applied Spatial Data Analysis with R*, 2<sup>nd</sup> edition. Springer, New York.

Anselin, Luc. (2005). *Exploring Spatial Data with GeoDa<sup>TM</sup>: A Workbook*, available at <http://geodacenter.asu.edu/system/files/geodaworkbook.pdf>.

## Course Evaluation

Final course grades will be based on the following weighting of assessment components:

- Class discussion 20%
- Homework 25%
- Midterm 15%
- Final project 40%

## Academic Misconduct

Please help maintain an academic environment of mutual respect and fair treatment. It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). Academic misconduct will not be tolerated and will be dealt with procedurally in accordance with university policy, which is available at <http://oaa.osu.edu/coam.html>. The Code of Student Conduct can be found at <http://studentaffairs.osu.edu/csc/>.

## Disability Services

All students who feel they may need accommodations based on the impact of a disability should contact the instructor privately to discuss their specific needs. Students with documented disabilities must also contact the Office of Disability Services (ODS) in 150 Pomerene Hall (614-292-3307) to coordinate reasonable accommodations for the course. ODS forms must be given to your instructor as early in the semester as possible to be filled out and returned to you.