GEOG 4103 – Introductory Spatial Data Analysis

Instructor

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Course Website

The course schedule, announcements, lectures, exercises, homework and lab assignments, and other course information will be posted on Carmen (https://carmen.osu.edu).

Required Textbook

[R] Rogerson, P.A. (2015). *Statistical Methods for Geography*: *A Student's Guide* (*Fourth Edition*), Sage Publications, London.

Prerequisites

Math 1116 or 1130 or above, or Math Placement Level M or L, or permission of instructor.

Course Description

This course provides an introduction to statistical analysis of spatial data emphasizing spatial thinking. In this course fundamental statistical methods are presented in the context of geographic sciences. Students will develop a fundamental understanding of statistical concepts and the tools geographers use to solve statistical problems. Lectures will introduce students a range of fundamental statistical and spatial analysis methods used in geographic problem solving. Labs will help students develop skills to analyze and interpret spatially referenced data using computer software. This course emphasizes hands-on experience and practical understanding. Real-world examples from a variety of topical areas in geography will be used in the lectures and labs.

Grading Policy

Your final course grade will be based on the following weighting of assessment components:

Homework	15%
Quizzes	15%
Labs	30%
Midterm Exam	15%
Final Exam	25%

- All homework and lab assignments should be turned in on time. Late submissions will be penalized by 10% per day late.
- There will be multiple quizzes, a midterm exam during the semester as well as a final exam. Quizzes and exams must be turned in on time to receive credits. Late submissions will not be accepted. No make-up quizzes and exams will be given unless legitimate documents for medical or personal emergency are presented in advance.

Final course grades will be assigned based on the following grading scale:

A: 93–100 | **A-**: 90–92 | **B+**: 87–89 | **B**: 83–86 | **B-**: 80–82 | **C+**: 77–79

C: 73–76 | **C-**: 70–72 | **D+**: 67–69 | **D**: 60–66 | **F**: below 60

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. For additional information, see the Code of Student Conduct at http://studentlife.osu.edu/csc/.

Students with Disabilities

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. **SLDS contact information:** slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Health and Safety Requirements

All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (https://safeandhealthy.osu.edu), which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

Weekly Topics

A tentative outline of weekly topics is given below. Students should check the course website frequently for updates.

Week	Topics	Readings
1	Introduction	[R] 1
2	Geographic data	[R] 1.7, 2.1
3	Descriptive statistics	[R] 2
4	Probability (I)	[R] 3
5	Probability (II)	[R] 4
6	Sampling	[R] 5.7
7	Estimation	[R] 5.1~5.2
8	Midterm Exam	
9	Hypothesis testing (I)	[R] 5.3~5.6
10	Hypothesis testing (II)	[R] 5.3~5.6
11	Analysis of variance	[R] 6
12	Correlation	[R] 7
13	Regression	[R4] 8, 9, 11; [R5] 9, 10
14	Regression	[R4] 8, 9, 11; [R5] 9, 10
15	Spatial autocorrelation	[R4] 11; [R5] 11
16	Spatial pattern analysis	[R4] 10; [R5] 11