

Spatial Data (Analysis)

GEOG 5100

Instructor:

Morteza Karimzadeh, Lecturer, Department of Geography

Office Location: Derby Hall 1120

Office Hours: Monday 2:30-3:30 PM, Thursday 11 AM -12 PM

Or by appointment

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Teaching Assistant:

Sohyun Park, Graduate Student in Geography

Office Location: Derby Hall 0160

Office Hours: Monday 3 - 5 PM, Friday 3 - 5 PM

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Meeting Times:

Days: Tuesday, Thursday

Time: 8:00 - 9:20 AM

Location: Derby Hall 135

Course Description:

This is an introductory course in statistical and computational thinking with a special emphasis on problems in the geographical sciences. This course consists of two weekly lectures period. Labs are assigned and worked on during lecture times (details in course schedule on Carmen).

Course Objectives:

Statistics is the art and science of finding patterns in data. This class teaches you about patterns in data: How to conceptualize patterns and how to use computers to identify them. This is a first course in statistics. Lectures aim to provide an intuitive understanding of statistical concepts. The goal is to teach you how to *think* about statistical problems.

The course is taught from *a computational perspective*. In this class you will develop a fundamental understanding of statistical concepts and tools. And, yes, there will be a few equations involved. However, I don't believe in memorizing formulas or asking you to regurgitate those formulas. Therefore, this course emphasized how to take the statistical concepts you learn in class and use computers to find solutions to real world problems. Computers are machines and they are very good at repetitive tasks like calculating a formula but they're not very good at thinking. In this class we will pair your critical statistical thinking skills with your computer's ability to crunch lots of numbers. *We will learn how to apply quantitative data to real world problems and accurately state what the data tells us about the problem at hand.*

The objectives of this course are to:

1. Develop “statistical literacy,” a working understanding of statistics that can help you to critically evaluate data-driven results in the discipline of geography.
2. Obtain a basic set of statistical tools for data analysis, with an understanding of how to choose which tool to use, how to implement them in statistical software and how to interpret results.
3. **Use R** and **GeoDa** to make graphs and maps, and to implement descriptive statistics, conduct hypothesis tests about sample means, and compute OLS and spatial regressions.
4. Understand problems arising from the use of spatial data

Required Materials:

Statistical Methods for Geography, 4th edition by P.A. Rogerson, Sage Publications.

This book is very reasonably priced (especially for a statistics book) and is **required**. Having good access to the book will be essential to success in this class. Readings will be assigned from the book weekly. Exams will cover material from the book (in addition to lecture material). Lectures will roughly parallel the assigned readings.

Ohio State library has the ebook version for the very first edition, which should suffice until your copies of the 4th edition arrive:

<http://osu.worldcat.org/title/statistical-methods-for-geography/oclc/70725124?ht=edition&referer=br>

There will be other mandatory readings available via PDF on the Carmen course website. These are also required and may be discussed in class. Students are also provided with additional optional readings available online at no cost.

Use Carmen (weekly) MODULES to find readings for each topic. Readings do not have a due date, and therefore, will not show up on the Carmen agenda/calendar.

Grading:

Participation:	10%
Labs (10):	50%
Final Exam:	10%
Quizzes (4):	30%

Participation credit can be earned in two ways 1) Participation in short weekly assignments, 2) participation in class exercises, 2) participation in classroom discussions. Of course, you actually have to attend class to earn a solid participation grade. There will be irregular roll calls throughout the semester.

Labs will be graded for completeness and accuracy. There are 10 lab assignments. Labs are cumulative and missing a lab can have major consequences for your ability to succeed in the class.

Final exam consists of several questions and completing a statistical analysis using the R programming language. An example of a final used a few years ago will be posted on Carmen later in the semester. There is no make up for the final exam if not delivered on the due date.

There will be four **quizzes** that will test your ability to apply concepts from class. I use quizzes to see how you're doing throughout the class. Any accommodation for the quiz date/time or length of time should be requested well in advance of the quiz and approved by the instructor. No makeup quiz would be administered otherwise and a 0 grade will be assigned.

I will use the scale below to calculate final grades. Note that grades are determined to 1 decimal place and rounded up to the next whole number.

○ A	93-100%	○ B-	80-82%	○ D+	67-69%
○ A-	90-92%	○ C+	77-79%	○ D	60-66%
○ B+	87-89%	○ C	73-76%	○ E	0-59%
○ B	83-86%	○ C-	70-72%		

Attendance:

Attendance in all classes and labs is mandatory. If you miss a class it is your responsibility to acquire the lecture/lab notes from a classmate. Poor attendance will reflect on your participation grade.

Due Dates:

Course schedule and assignment descriptions in Carmen are your source for identifying due dates and assignment formats. Lab assignments are due in Carmen on the dates indicated in the lab instructions. All assignments, lab reports, and project proposals must be submitted as Microsoft Word (or Open Office files that are importable into Word) to enable comments and suggestions on your writing and must follow a specific format (given in the specific assignments.), with the exception of presentations, for which PowerPoint files or PDF slides suffice.

Any late assignments will be subject to a late penalty of -10%/day for each day late -- up to 7 days late (10% of the original total, thus a 30 point assignment that is 2 days late will have 6 points subtracted from the total score). **No assignments will be accepted that are more than 7 days late.**

Communication

My best advice to you is to see me during the office hours or set up an individual appointment if you have a scheduling conflict. Certain parts of this course are very much hands-on, and five minutes of in-person interactions are often more productive than an email thread spanning multiple days. Office hours are long and dreary, and nothing lightens up my mood better than to see a student walk in.

Expectations and Etiquette:

I expect everyone to be respectful of class colleagues, the instructor and TA. Class disruptions and side conversations should be kept to a minimum. This includes turning off your cell phone ringer when you enter the class. In my view, talking or using an electronic device in class shows a lack of respect for the people sitting near you who are paying tuition to learn. **Laptops and mobile devices should not be used in the classroom (except on specific dates).**

I will work very hard to make sure that the class operates smoothly but computers sometimes misbehave, please be patient. I understand that this is a difficult class and that sometimes life is even less cooperative than computers. If you have a personal emergency, I will do my best to help you through the class, however ***under no circumstances can you excel in this class without doing ALL of the work it requires.***

Disclaimer

Please note that this Course Syllabus and schedule are subject to change. Students are responsible for abiding by such changes.

University Policies:

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. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. 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.

Religious observances:

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance.

Classroom Etiquette:

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color,

disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Academic Misconduct:

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 33355487). For additional information, see the [Code of Student Conduct](#).

Title IX Statement:

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan at titleix@osu.edu.