

GEOG 5700/6700: Quantitative Methods and Spatial Analysis

Department of Geosciences, Auburn University

Dr. Stephanie Rogers

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Office location: Haley 2046F

Office hours: M 3:00 – 4:00pm or by appointment (zoom is also possible)

Teaching Assistant: TBA (office hours by appointment)

Fall 2023

Class time: MW 1:00 – 2:50pm

Class location: Haley 2174

3 Credit hours

What is this course about?

This course aims to provide you with the knowledge and skills necessary to investigate and explore patterns in spatial datasets pertaining to both human and environmental processes on Earth. Essential theoretical concepts in quantitative methods and spatial analysis will be introduced and applied using geospatial software (e.g., ArcGIS Pro and Geoda). You will be expected to think critically about course content while developing research questions and hypotheses for which you will analyze data, create clear visualizations, and critique the results of your investigations. You will also be required to provide critical feedback to your classmates' work. Focus will be on understanding the theories and methods of quantitative geography and spatial analysis so that you are equipped with the knowledge to find and apply the best analytical tools for a given research problem involving spatial data. You will also learn to collaborate in groups, provide constructive feedback, and communicate scientific results as reports and presentations.

What will you learn?

- 1...fundamental and theoretical concepts behind quantitative methods, spatial analysis, and spatial data
- 2...to explore spatial datasets and analyze geographic distributions across space and time using geospatial software
- 3...to formulate research questions and hypotheses to guide spatial investigations
- 4...to apply critical thinking skills when reviewing scientific journal articles, your own work, and that of your peers

Readings and textbooks

Readings: course readings are essential and all literature will be provided on Canvas.

Textbooks:

- Primary source (full text available on Canvas and through the library):
 - Steinberg, S. J., & Steinberg, S. L. (2006). *Geographic information systems for the social sciences: Investigating space and place*. SAGE Publications, Inc. <https://www.doi.org/10.4135/9781452239811> (Library: <https://methods-sagepub-com.spot.lib.auburn.edu/book/geographic-information-systems-for-the-social-sciences>)
- Online references:
 - de Smith, Goodchild, and Longley (2020), [Geospatial analysis](#). with companion [Statistical Analysis Handbook](#) (2018)
 - Campbell and Shin (2011), [Essentials of Geographic Information Systems](#)

Sections

Weeks	Theme	Overview
1-4	Understanding Concepts	<ul style="list-style-type: none"> • Introduction to main course themes • Begin to understand quantitative methods and spatial analysis through a critical lens • Reading/thinking/critiquing
5-7	Developing Knowledge	<ul style="list-style-type: none"> • Establish a conceptual framework for your project • Develop a research question and hypothesis • Learn how to write a white paper and provide/accept constructive feedback • Introduction to critical GIScience concepts
8-12	Analyzing and Interpreting Geospatial Information	<ul style="list-style-type: none"> • Explore different ways to analyze spatial data • Develop understanding about key spatial analysis methods • Practice interpreting results
13-16	Communicating Results	<ul style="list-style-type: none"> • Finalize data analysis and interpretation • Summary and present results to the general public and your peers • Write an effective final report to convey results

Dynamic course schedule

Please use this link: aub.ie/FA2023_QMSA to follow along with the detailed course activities including topics, deliverable dates, links to readings, and basically everything! Bookmark this link in your browser for easy access to info.

How will you be assessed?

Assessment	Points	Breakdown 6700
Class Participation	150	Various – 150 pts
Labs	300	Lab 1 – 100 pts Lab 2 – 100 pts Lab 3 – 100 pts
Projects	400	White paper – 100 pts Presentation @ GIS Day – 50 pts Data & Workflow – 50 pts Final report – 200 pts
Quizzes	150	TBD – 150 pts
Total	1000	1000

A 1000-point grading scale will be used for the final grades: 900-1000 A, 800-899 B, 700-799 C, 600-699 D, <600 F.

Class discussion platform – Microsoft Teams

We will be using **Teams** for class announcements and discussions (visit [Getting started guide](#) if you are unfamiliar with how it works). You can access the Teams group [here](#). We will use this platform for all forms of class communication (questions, troubleshooting, group discussions etc.). Please ensure your notifications are turned on, either from the desktop version or the app. Please do not email with questions, send a message on Teams. You will get a much quicker response this way. Additionally, be respectful of my work/life balance and understand that I will not usually respond outside of regular work hours (i.e., 8-5 Monday to Friday).

Class Policies

Attendance: *Class attendance is mandatory due to the nature of this course. Class attendance will be carefully monitored and recorded.* All announcements concerning assignments, possible changes in examination dates, etc., will be given in class. **If an absence is unavoidable, it is the student's responsibility to contact classmates to obtain notes and class announcements.**

Make-up Policy: No make-up quizzes or assignments are given without a University-approved excuse. If for a legitimate reason you cannot take a quiz on a given date, it is your responsibility to contact me as soon as possible, preferably before you miss the exam. If you miss a quiz and you have a University-approved excuse (see Student Policy eHandbook, www.auburn.edu/studentpolicies) with appropriate written documentation (e.g., from a doctor, lawyer, or coach, on official stationary) that is turned in within one week of the missed quiz, then you will be allowed to take a make-up quiz. All make-up quizzes will be given within 2 weeks of the original in one of your instructor's offices. A zero will be assigned two weeks from the date and time of the quiz that you missed. **No make ups are given for missed in-class activities; no quizzes will be given early without a university-approved excuse.**

Behavior: Civility and integrity is expected at all times. The use of cell phones, tablets, or laptops for purposes other than class related work is not allowed during class or lab. Flagrant violation of this policy will result in you being dismissed from class.

Face Coverings: Face coverings in this class are currently optional. This may change throughout the semester depending on the status of COVID-19 at Auburn University. In the case that face coverings are again needed, students in this class will be required to wear face coverings that appropriately cover the nose and mouth to limit the spread of infectious disease. Failure to comply with the requirement represents a potential Code of Student Conduct violation and may be reported as a non-academic violation. Please consult the [Policy on Classroom Behavior](#) for additional details.

Emergency Contingency statement: If normal class and/or lab activities are disrupted due to illness, emergency, or crisis situation (such as another COVID-19 outbreak), the syllabus and other course plans and assignments may be modified to allow completion of the course. If this occurs, an addendum to your syllabus and/or course assignments will replace the original materials.

Generative Artificial Intelligence tools

Moderate Use Guidelines: Encourage AI use in specific assignments, but not all. Students must disclose any AI assistance.

AI Policy: Permitted when Assigned in this Course with Attribution

In this course, students are permitted to use Generative AI Tools such as ChatGPT for specific assignments, as designated by the instructor. To maintain academic integrity, students must disclose any use of AI-generated material. As always, students must properly use attributions, including in-text citations, quotations, and references. Students should exercise caution and avoid sharing any sensitive or private information when using these tools. Examples of such information include personally identifiable information (PII), protected health information (PHI), financial data, intellectual property (IP), and any other data that might be legally protected.

A student should include the following statement in assignments to indicate use of a Generative AI Tool: "The author(s) would like to acknowledge the use of [Generative AI Tool Name], a language model developed by [Generative AI Tool Provider], in the preparation of this assignment. The [Generative AI Tool Name] was used in the following way(s) in this assignment [e.g., brainstorming, grammatical correction, citation, which portion of the assignment]." Failure to do so will result in a violations of the Academic Honesty Policy (see below).

Academic Honesty Policy: Academic honesty is taken very seriously in this course. It is your responsibility to know what plagiarism is. All portions of the Auburn University student academic honesty code (Title XII) found in the [Student Policy eHandbook](#) will apply to this class. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

In this class, violations of academic honesty include, but are not limited to

1. using generative AI without proper attribution as stated above

2. copying another person's work on any graded assignment or test,
3. allowing someone to copy your work,
4. collaborating on a graded assignment without the instructor's approval,
5. using unauthorized "cheat sheets" or technical devices such as calculators or cell phones for graded tests or assignments. Having an electronic device accessible during class on an exam day will be considered cheating, and you will earn a zero on the exam,
6. using quotes, summarizing ideas or borrowing facts, statistics, graphs, pictorial representations, or phrases without acknowledging the source, and
7. other infractions listed under the Auburn University Student Academic Honesty Code at <https://sites.auburn.edu/admin/universitypolicies/Policies/AcademicHonestyCode.pdf>

Disability Accommodations: Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).

Basic Needs

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course or others is urged to contact Auburn's Basic Needs Center for support at <https://aub.ie/basicneeds>. Furthermore, please notify the professor if you are comfortable in doing so as this will allow the faculty member to connect you with any other known resources. I would be more than happy to help you.

Mental Health

If you are experiencing stress that feels unmanageable (personal or academic) during the semester, Auburn University's Student Counseling & Psychological Services (SCPS) offers a variety of services to support you. The mission of SCPS is to provide comprehensive preventative and clinical mental health services to enhance the psychological well-being of individual students, as well as the broader campus culture. As an instructor, I am available to speak with you regarding stresses related to your work in this course, and I can assist in connecting you with the SCPS network of care. You can schedule an appointment yourself with the SCPS by calling [\(334\)844-5123](tel:3348445123) or by stopping by their offices on the bottom floor of Haley Center or the second floor of the [Auburn University Medical Clinic](#).

If you or someone you know needs to speak with a professional counselor immediately, the SCPS offers counseling during both summer term as well as the traditional academic year. Students may come directly to the SCPS and be seen by the counselor on call, or you may call [334.844.5123](tel:3348445123) to speak with someone. Additional information can be found at <http://wp.auburn.edu/scs>.

Justification for Graduate Credit

This course goes above and beyond typical undergraduate courses by challenging the student to think critically about scientific literature, critique themselves and their peers in an effective manner, explore advanced GIScience concepts, and present their researching findings to their peers and the broader public.