

GEOG 6700: Quantitative Methods and Spatial Analysis

Department of Geosciences, Auburn University

Dr. Stephanie Rogers

s.rogers@auburn.edu

334-844-4069

Office location: Haley 2046F

Office hours: Please email for appointment

Teaching Assistant: Kaj Overturf kao0025@auburn.edu

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Class time: **MW** 9:00 – 10:50am

Class locations: Zoom, Haley 2174 & 2130

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 **ArcGIS Pro**. You will be expected to develop 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 ArcGIS Pro
- 3...to formulate mini 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: from primary literature will be listed on the [dynamic course schedule](#) (more info on next page) and provided on Canvas.

Textbooks:

- Primary source (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 | Topics |
|-------|--|
| 1-5 | Section 1: Building a conceptual framework for spatial data and analysis |
| 6-10 | Section 2: Research design and spatial data exploration |
| 11-14 | Section 3: Analysis, interpretation, and visualization |
| 15-16 | Section 4: Wrap-up, work on deliverables, presentations |

How will you be assessed?

| Assessment | Points | Breakdown |
|---------------------------|-------------|---|
| Exercises & Participation | 200 | Various – 200 pts |
| Labs | 300 | Lab 1 – 100 pts Lab 2 – 100 pts Lab 3 – 100 pts |
| Projects | 500 | White paper – 100 pts Presentation – 150 pts Data & Workflow – 50 pts Final report – 200 pts |
| Total | 1000 | 1000 |

A 100-point grading scale will be used for the final grades: 900-1000 A, 800-899 B, 700-799 C, 600-699 D, <600 F.

*Due dates may be subject to change and changes will be announced in class and on Canvas.

Dynamic course schedule

Please use this link: aub.ie/SP2022_QMSA to follow along with all course activities including topics, deliverable dates, links to readings, and basically everything!

Class discussion platform – Slack

We will be using **Slack** for class discussions (visit [Getting started guide](#) if you are unfamiliar with how Slack works). You can access the slack channel [here](#). We will use Slack for all forms of class communication (questions, troubleshooting, group discussions etc.)

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. See COVID-19 section below for special circumstances.**

Make-up Policy: No make-up quizzes 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 EXAMS WILL BE GIVEN EARLY WITHOUT A UNIVERSITY-APPROVED EXCUSE.

Behavior: Civility and integrity is expected at all times. The use of cell phones (including texting), 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.

Academic Honesty Policy: 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. copying another person's work on any graded assignment or test,
2. allowing someone to copy your work,
3. collaborating on a graded assignment without the instructor's approval,
4. 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,
5. using quotes, summarizing ideas or borrowing facts, statistics, graphs, pictorial representations, or phrases without acknowledging the source, and
6. 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).

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>.

COVID-19 Related Guidelines

Health and Participation in Class

If you are experiencing any symptoms of COVID-19, or if you discover that you have been in close contact with others who have symptoms or who have tested positive, please do not come to class. We can make accommodations for you to join virtually. Please let the instructor know if you would like accommodations for this. My hope is that if you are feeling ill or if you have been exposed to someone with the virus, you will stay home to protect others.

Please do the following in the event of an illness or COVID-related absence:

- Notify me in advance of your absence, if possible
- Provide me with medical documentation, if possible
- Keep up with coursework as much as possible
- Participate in class activities and submit assignments remotely as much as possible
- Notify me if you require a modification to the deadline of an assignment or exam
- Finally, if remaining in a class and fulfilling the necessary requirements becomes impossible due to illness or other COVID-related issues, please let me know as soon as possible so we can discuss your options.

Students with questions about COVID-related illnesses should reach out to the COVID Resource Center at (334) 844-6000 or at ahealthieru@auburn.edu.

Health and Well-Being Resources

These are difficult times, and academic and personal stress is a natural result. Everyone is encouraged to take care of themselves and their peers.

If you need additional support, there are several resources on campus to assist you:

- COVID Response Team (www.ahealthieru.edu)
- Student Counseling and Psychological Services (<http://wp.auburn.edu/scs/>)
- AU Medical Clinic (<https://cws.auburn.edu/aumc/>)
- If you or someone you know are experiencing food, housing or financial insecurity, please visit the Auburn Cares Office (<http://aucares.auburn.edu/>)

Course Expectations Related to COVID-19

- Face Coverings: Auburn University permits individual faculty members to require face coverings in their classrooms, instructional laboratories, and offices. All students enrolled in this course are required to properly wear a face covering that covers the nose and mouth while inside the classroom, laboratory, faculty member offices, or group instructional spaces. Failure to comply with this requirement represents a potential Code of Student Conduct violation and may be reported as a non-academic violation. Please consult the Classroom Behavior Policy for additional details.
- Course Attendance: If you are quarantined or otherwise need to miss class because you have been advised that you may have been exposed to COVID-19, you will be expected to develop a plan to keep up with your coursework during any such absences.
- Technology Requirements: This course may require particular technologies to complete coursework. If you need access to additional technological support, please contact the AU Bookstore at aubookstore@auburn.edu.