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**Course Information**

**Course Number:** GEOG 312, Spring 2025

**Course Title:** Data Analysis in Geography

**Section:** 500

**Credit Hours:** 3

**Time and Location:** TR 3:55-5:10 pm, HALB 101

**Course Prerequisites:** STAT (Statistical Methods) 303.

**Class Webpage:** <https://canvas.tamu.edu/>

**Instructor Details**

**Instructor:** Dr. Shobha Yadav

**Office:** 814C Eller Oceanography  
and Meteorology Building

**Phone:** 979-458-2587

**Email:** [shobhayadav@tamu.edu](mailto:shobhayadav@tamu.edu)

**Office hours:** Monday 12 to 1 pm  
or by appointment

**Course Description**

This course is the foundation for the collection and analysis of quantitative and qualitative geographic data. This course will introduce several quantitative methods used by geographers to analyze and interpret geographic data and solve geographic problems. The course will be taught from the perspective of geographical, climate, and spatial data analysis as well as a brief introduction to programming language, R.

**Course Learning Outcomes**

After completing this course, students are expected to have the ability to:

- Understand the scientific method and critically evaluate scientific information
- Perform a variety of statistical analyses
- Create informative visualizations of results
- Comprehend and associate geographic patterns at various spatial scales
- Develop the technical ability to work with large and small datasets
- Demonstrate competency in data presentation by conducting original quantitative research with a conference quality poster

**Recommended Textbook and/or Resource Materials**

*Statistical Methods for Geography: A Student's Guide*

Lectured PowerPoint will be available through the Canvas learning management system.

Access to a computer with Excel and R

**Copyright:** The materials used in this course are copyrighted. These materials include but are not limited to the syllabus, labs, exams, slides, in-class materials, handouts, and additional problem sets. Because these materials are copyrighted, you may not upload your class notes or any other course materials (e.g., this syllabus, any lecture slides, lab and/or exam questions) to note-sharing or tutoring/student services websites. Doing so constitutes a violation of the Aggie honor code, in addition to copyright infringement.

## Grades and Grading Scale

Your grade in this course will be based on the following elements (**total 500 pts**):

Item	Percentage	Points
Assignment	40%	200
In-Class Activities	15%	75
Final Project	25%	125
Quizzes	20%	100

The final grades may be computed using a curve if it is appropriate. The curve in this course solely helps to increase your final course grade potentially; **under no circumstances** will I ever curve the grades in a way that is to your disadvantage. If you believe there has been a mathematical error in calculating your grade, please schedule an appointment or visit me during office hours. I am not able to email you your grades because of the Family Educational Rights and Privacy Act ([FERPA](#)).

The grading scale follows the Texas A&M University grading system:

A = Excellent	≥90%
B = Good	80–89%
C = Satisfactory	70–79%
D = Passing	60–69%
F = Failing	<60%

The weights for the grading schedule are as follows:

1. Assignments 40%

Assignments will be made available on Canvas. Due dates and other information will be provided on the assignment, and students will submit their work electronically via Canvas. Most if not all assignments will involve working with the R programming language. Some assignments will likely involve collecting data using Google Earth.

## R

Most of the work done in this class involves using the R programming language. Students are not expected to have programming experience before this class. However, to complete this course, students are required to have access to R and RStudio to complete the assignments, in-class activities, and final projects. Students who believe that this may be a problem for them are required to contact their instructor immediately. Students are strongly encouraged to follow along with the instructor in R.

2. In-Class Activities 15%

In-class activities must be completed during the lecture and cannot be made up during an unexcused absence. In-class activities will be made available on Canvas. To conduct class activities I will be using iClicker and Canvas. You are required to bring your smartphone, tablet, or laptop device to participate in my iClicker sessions during class. It is also your responsibility to properly set up your iClicker account in a timely fashion and to regularly check your iClicker grades for any discrepancies and bring them to my attention quickly. Please check a separate ppt on Canvas for more detailed information on how to set up an iClicker account.

3. Final Project 25%

The final project involves developing a research project in groups. The goal is to demonstrate the group's ability to develop, execute, and communicate the research project's results. The project will involve submitting a final project proposal, project outline, draft report, and final report (see course schedule below).

4. Quiz 20%

There will be two quizzes that account for 20% of your overall course grade (midterm = 10%, final = 10%). It will be based on the course materials covered in the class.

### **Attendance, Make-Up, and Late-Work Policies**

You are expected to attend all lectures. If you miss a lecture, please work to get the notes from someone in class. The instructor will not provide you with missed notes.

You are responsible for keeping an eye on all the announcements that are posted on Canvas.

To be considered for an excused absence the student must notify the instructor in writing (e-mail is acceptable) **prior to the day of absence**. In cases where advanced notification is not possible, the **student must provide notification by the end of the second business day after the last date of the absence**. This notification must include an explanation of why the notice could not be sent. Please see Student Rule 7 for details.

You will be permitted to make up assignments without penalty that you miss for a university-excused absence. You may, however, submit the assignments late without an excused absence, in which case 10% is deducted per day.

**Makeup of any missed quizzes or assignments will be allowed only if I am notified of the University-excused absence before the test.**

Please remember that I do not give out grades; you earn grades. If you need a particular grade in this class to avoid having some tragedy happen to you (like being kicked out of the university, losing your scholarship, being unable to participate in athletics or other extracurricular activities, etc) then please be prepared to work for that grade. I am always willing to offer help and assistance, but you must also put in the required effort.

**Communications:** The best way to contact me is through email. Please use your **official @email.tamu.edu e-mail** to communicate with you if you have any questions regarding the class. I cannot respond to messages from personal Gmail, Yahoo, etc. accounts. **When emailing me about class put “GEOG 312” in the subject line.** All the class-related announcements including exam information papers, or mistakes I made in the lecture will be communicated through email. Please check your **official @email.tamu.edu e-mail** regularly for potentially important announcements. **Please do not use Canvas to communicate with me.**

Please use my **office hours** (as mentioned above) to discuss your grade as well as to ask questions. Email is not a substitute for office hours, but you can email me if you have any questions. I will try my best to answer your questions through E-mail promptly (by the next 2 school days). If you do not receive a response, please follow up with me because we may not have received the e-mail for various reasons. Do not wait until the last minute to ask questions, especially before the exam. **Please do not expect me to reply to emails off the regular office time, e.g., 5:00 pm – 8:00 am or during the weekend.**

### General Expectation

Feel free to bring laptops, iPads, or any other devices to class, as long as they are used for classroom purposes. However, any rude or disruptive behavior will not be tolerated to ensure a positive learning environment. You will be asked to leave the class if your behavior is considered inappropriate.

### ChatGPT and Generative AI Tools

You may use AI programs e.g. ChatGPT to help generate ideas and brainstorm. However, you should note that the material generated by these programs might be inaccurate, incomplete, or otherwise problematic. Beware that use may also reduce your own independent thinking and creativity. You **cannot submit any work generated by an AI** program as your own. If you include material generated by an AI program, it should be cited and rephrased like any other reference material.

Any plagiarism or other form of cheating will be dealt with severely under relevant Texas A&M University policies.

### Resources

**University Writing Center (UWC):** The UWC is located in suite 1.214 on the second floor of Evans Library. It provides students with one-on-one consultations with a trained writing consultant. They can help you with all aspects of the writing process (e.g., how to start writing, how to proofread your work, how to write an introduction). Please call (458-1445), click (<http://writingcenter.tamu.edu>), or visit the UWC to make an appointment or to find out more about their services.

## Course Topics and Tentative Schedule: Spring 2025\*

Week	Topic*	Assignments Due* (Due on Tuesday Unless Otherwise Stated)
<b>1</b> 1/13	Introduction to Research Methods	None
<b>2</b> 1/20	Defining Data in Geography Distributions and Probability	Assignment 01
<b>3</b> 1/29	Spatial Sampling Sampling Fields	Assignment 02
<b>4</b> 2/3	Exploring and Cleaning Data	Assignment 03
<b>5</b> 2/10	Visualizing Data	Assignment 04
<b>6</b> 2/17	Parametric and Non-Parametric Tests	Assignment 05
<b>7</b> 2/24	Maps as Outcomes of Processes Point Pattern Analysis	Assignment 06 Final Project Proposal
<b>8</b> 3/3	<b>Quiz I</b>	Assignment 07
<b>3/10</b>	<b>Spring Break</b>	<b>None</b>
<b>9</b> 3/27	Correlation and Regression Spatial Autocorrelation	Assignment 08
<b>10</b> 3/24	Local Statistics	Final Project Outline
<b>11</b> 3/31	Describing and Analyzing Fields	Assignment 09
<b>12</b> 4/7	Introduction to Machine Learning	Assignment 10
<b>13</b> 4/14	Communicating Your Results Qualitative Methods	Draft Final Project Report
<b>14</b> 4/21	<b>Quiz II</b>	
<b>Final</b> 4/29	Final Project Submission	Final Project Report

*\*Note: This outline is only a guide. You should expect departures from this outline.*

## University Policies

### Academic Integrity

**Aggie Code of Honor: “An Aggie does not lie, cheat, or steal, or tolerate those who do”**

<https://aggiehonor.tamu.edu/>

Texas A&M has an *Academic Integrity Policy* to which both students and faculty must comply. The Aggie Honor System Office handles all cases of academic misconduct. Details about the Aggie Honor Policy can be found at <https://aggiehonor.tamu.edu/>.

Plagiarism is when you pass off someone else’s work (language or ideas) as your own. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism destroys the trust among colleagues without which research cannot be safely communicated.

For more information, see “Scholastic Dishonesty” under the Texas A&M University Student Rules: <https://student-rules.tamu.edu/>.

### Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please contact Disability Services, currently located in the [Student Services Building](#), or at (979) 845-1637. For additional information, visit <https://disability.tamu.edu/>.

### Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention—including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need. Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS). Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage.

### **Statement on Mental Health and Wellness**

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall well-being. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. on weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at [suicidepreventionlifeline.org](https://suicidepreventionlifeline.org).

### **Academic Freedom and Classroom Discussion**

Academic freedom is a cornerstone of the University. Academic freedom in its teaching aspect is fundamental for the protection of the rights of the teacher in teaching and of the student to freedom in learning.

- 1) Each faculty member is entitled to full freedom in the classroom discussing the subject which the faculty member teaches.
- 2) Texas A&M will not penalize or discipline members of the faculty because of their exercise of academic freedom.

Along with this freedom comes responsibility. It is the responsibility of faculty members to ensure that topics discussed are related to the classroom subject. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.

- 3) It is not the proper role of the university or any outside agency to attempt to shield individuals from ideas and opinions they find unwelcome, disagreeable, or even deeply offensive.

Engaging with new ideas and perspectives helps students grow intellectually and is beneficial to the educational process.