

Introduction to GIS

Course Information

Instructor: Ramachandra Sivakumar (siva@design.gatech.edu)

Course Prefix and Number: CP 4510 - RS

Term: Fall 2026

Course Description

Geographic Information Systems (GIS) have become ubiquitous and play a key role in business support systems in diverse domains. It is hard to think of a data element in our everyday lives that doesn't have an explicit or implicit reference to location. Organizations of varying sizes in a variety of industries and disciplines utilize GIS technology and tools for better decision making. For example - planners, engineers, real estate developers, policy makers, environmentalists, business analysts, and public health officials often need to analyze large volumes of spatial, or location encoded information to effectively address respective domain problems to derive optimal solutions. GIS is an ideal framework for effective data management, perform analysis, visualizing results, and automate processes from small departments to enterprise scale. Current advances in cloud computing offer a paradigm shift in bringing geospatial solutions closer to consumers by enabling analysis capabilities through edge devices such as a mobile phone. This course will introduce students to GIS concepts, data, mapping, and analysis through lectures and accompanied by hands-on lab exercises.

Course Learning Outcomes

By completing the course students will:

- Develop a firm understanding of the basic principles of Geographic Information Systems (GIS) through software driven hands-on approach.
- Gain a deep working knowledge of market leading GIS software while exploring and applying methods & workflows to solve spatial problems through lab exercises, assignments, and a final group project.
- Identify, explore, understand, and evaluate various public domain spatial and non-spatial data repositories from a variety of sources and domains.
- Learn to create, aggregate, analyze, and manipulate spatial data utilizing a variety of geo-processing techniques.
- Become proficient in cartographic best practices and digital map making process for effective visual communication.
- Apply skills from the course to a real world problem in a group project.

- Introduce latest trends in GIS workflow through software as a Service (SaaS) cloud portals and online Web-GIS platforms.

Required Course Materials

Maribeth Price; **Mastering ArcGIS Pro – Second Edition**. NY: McGraw Hill

ISBN: 978-1-264-09120-1

Book is available in print and e-version from [McGraw Hill](https://www.mhhe.com) and other outlets. It is also available to rent. Obtain a version that suits your needs. You will be required to complete tutorials and exercises from the book throughout the semester.

Grading Policy

Student grades will be based upon continuous evaluation over the full semester. Points will be accrued on satisfactory completion of tasks outlined as per deadlines.

A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; F = <60%

Grading Rubric:

- Completion of assigned readings and in-class hands-on exercises (10%)
- Book Chapter Practice Exercises (20%)
- Homework Assignments (35%)
- Exams (20%)
- Final Homework (15%)

Extensions and Late Submissions

Due dates for assigned work must be followed. Late submissions will incur a 10% penalty for each class period when it is late. Submissions will not be accepted after two weeks of submission deadline.

Attendance Policy

Students are expected to attend classes and participate in discussions. Two absences are allowed. Absences beyond must be approved by the instructor.

Academic and Research Honesty/Integrity Statement

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review the student [Code of Conduct](#) and the [Academic Honor Code](#), especially [Appendix A: Graduate Addendum to the Academic Honor Code](#).

Students are expected to perform research in an ethical and responsible manner. All Doctoral and Master's Thesis students are required to take the [Responsible Conduct of Research training](#), and it is expected that students abide by the principles taught in that training while performing research.

Allegations of scientific or scholarly misconduct are handled in accordance with the procedures outlined by the [Policy for Responding to Allegations of Scientific or Other Scholarly Misconduct](#).

Core IMPACTS

Not applicable.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Expectations of Students

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The [Expectations of Advisors and Advisees](#) articulates some basic expectations that you can have of your advisor and that they can have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek.