CRP 4080 Introduction to GIS for Planners
Cornell University, Fall 2024

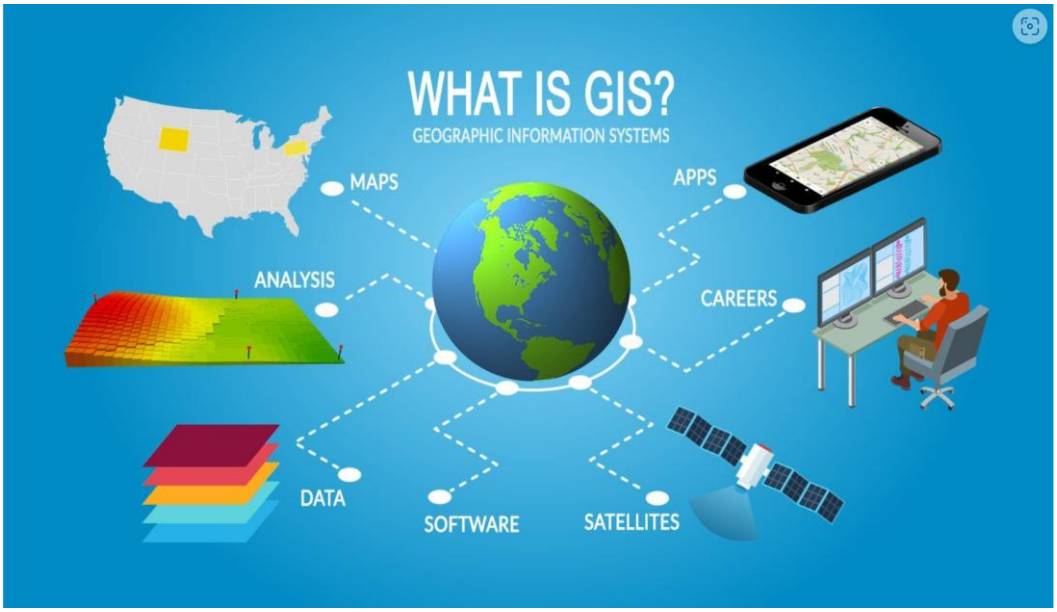

Image Source: https://gisgeography.com/what-gis-geographic-information-systems/

COURSE INFO

Day/time: Tuesdays and Thursdays, 10:10am – 12:05pm
Location: Barclay Gibbs Jones Lab, Sibley Hall 305
Credits: 4 credits

Instructor: Wenzheng Li (wl563@cornell.edu)
Instructor's Office Hours: TBD, Location: 214, Sibley

Teaching Assistants: Gauri Nagpal (gn247@cornell.edu), Shubham Singh (ss3736@cornell.edu), Anika Sinthy (ats243@cornell.edu)
TA Office hours: TBD

COURSE DESCRIPTION

Welcome to the world of spatial analysis and geographic information systems (GIS). Throughout history, humans have relied on maps for information, and in today's era of big data, spatial intelligence has become indispensable for making everyday decisions. Advanced technology now enables us to use GIS and spatial analysis to solve complex, location-based problems. This course will teach you how to use these tools for both basic and advanced spatial analysis.

This course will provide a conceptual understanding of geographic information systems (GIS) and sciences, and practical hands-on experience with GIS software applied to real-world planning practice and research. During the first half of the course, we will learn the basic concepts, structures, and functions of GIS as well as their applications and limitations. Topics may include thematic mapping; projections and coordinate systems; geoprocessing; onscreen digitizing and editing; spatial data management; raster and vector data models; and sources of geospatial data.

In the second half of the course, we will introduce several applied case studies and spatial

analysis techniques applicable to planning practice, including a site suitability analysis using Model builder, an environmental justice analysis using census data, an introduction to spatial autocorrelation and spatial statistics, and interactive web mapping using Arc StoryMaps.

The course will include a midterm quiz, the purpose being to test conceptual knowledge of GIS, and a final project, which will involve spatial analysis of a planning related problem of the students own choosing. Although there are no prerequisites, students are expected to have basic computer operating skills and are familiar with spreadsheet software which assists in processing data for use in GIS.

LEARNING OUTCOMES

By the end of this course, students should be able to:

- Feel comfortable working within ArcGIS Pro and be familiar with a range of available tools and methods to address planning-related problems and issues.
- Produce and interpret maps and other forms of spatial information found in professional planning reports, research articles, news media, and public forums. Communicate spatial information effectively using maps (visual communication) and connect visual communication to expository writing and argumentation.
- Examine and be able to apply and spatialize basic statistical and qualitative knowledge of urban and regional issues.
- Be able to independently conceive of and manage a GIS project. This involves a) proposing a planning analysis/research question that requires GIS data and spatial analysis; and b) collecting, processing, and analyzing spatial data to interpret the findings.
- Use online resources and software documentation to learn new GIS techniques when necessary.

COURSE FORMAT

The class will be conducted as a lecture in conjunction with computer lab sessions, stressing hands-on application and building familiarity with the software through practice. I will spend class time on Tuesdays introducing the material through lecture, and then we will begin on that week's lab. Thursdays will generally be devoted to in-class lab work, with **the lab assignment due the following Thursday**. The purpose of the lab session is to encourage peer to peer interaction and teaching, so get to know the people around you. TAs and I will be present and available during the labs to help with coursework. In addition, the Ph.D. TA and I will hold weekly office hours. From time-to-time, additional material, guest speakers, or in-class demonstrations will take place on Thursday.

The beginning of the semester will generally be more lecture intensive (lectures will be uploaded weekly to Canvas under the modules tab). In order to complete the labs, you will need access to ArcGIS Pro and ArcGIS online, for which Cornell has an institutional license. AAP IT will assist with installing and accessing the appropriate software. Please email Andre Hafner (ah97), AAP IT support, for further questions.

The Barclay Jones Lab (Sibley 305) is open from 7:30 a.m. to 3 a.m. except for some holiday breaks (*As per College policy, the computer lab will be closed during the Thanksgiving break. Please keep this in mind when planning to complete the labs and work on the final project.*). It's reserved for CRP students after 5 p.m., meaning you need to use your ID card to get in,

and if you are not a CRP or URS student, you need someone to let you in. If you encounter difficulties, one option is to use Mann Library, which has ArcGIS installed. If you download ArcGIS to your laptop, you may bring it to the lab to use instead of the desktops.

I also understand that the current situation is dynamic, and the syllabus may be updated accordingly. It may be that we need to re-examine expectations for the lab assignments and adjust accordingly.

READINGS

There is no formal textbook for this course. With the advancement of technology, existing materials get outdated very quickly. Therefore, most of the required readings will come from online ebooks and a few research articles. Links to all the readings will be found under both the syllabus and the Modules tab in Canvas.

COURSE GRADING

1. Problem Sets (60%)

Both the lab and the associated data will be made available weekly through the 'modules' tab on Canvas. There are currently 10 scheduled lab assignments. These generally (though not exclusively) consist of a scripted lab component followed by a homework assignment meant to be **your own work**. Forming a study group of no more than 4 people is encouraged only to discuss your thought and operation process. You should not copy each other's work. Plagiarizing others' work will receive a 0 for the lab. Computer skills vary widely, so students should be aware they may have to spend time outside of class working on labs and homework assignments. Labs will be due the following Tuesday after they are assigned, by the beginning of the class. Students should upload each lab to Canvas via the 'Assignments' link. Labs should be saved as a single **word document** (with any maps embedded as images) as last name_lab #.doc.

Late lab assignments will automatically be downgraded unless there is a medical or family emergency:

5%: if turned in the following day
10%: if turned in within 1 week
25%: after 1 week

All late labs are due no later than **a week after the Last Day of Classes**. Otherwise, you will receive a 0 for the late lab(s). A weekly help session will be offered outside of lab hours. The date and time for the extra help session will be announced in class. Students must be respectful of the TAs' time and only seek assistance when necessary, during appropriate times.

2. Final Project (5% + 25%)

The purpose of the project is to provide additional experience in collecting, processing and/or analyzing spatial data and should focus on a planning analysis/research problem that requires GIS data and spatial analysis to address/analyze the problem. This project can (and should) be of the students choosing (for instance, it can overlap with outside work, another class, or as part of an exit project). The final project's requirements and guidelines will be elaborated

on later during our progress in course work. Students may work in teams or individually. The final project grade will include **a presentation** component (5%) in which you share your work during the last weeks of class.

There will be a couple lab sessions toward the end of the semester, which will be devoted to working on the project. However, students must start thinking about project ideas as soon as possible. You are expected to provide **a preliminary project proposal** by the date specified in the syllabus. In addition, I will ask you to schedule a mid-semester appointment with me. Previous years' projects will be placed in a folder under the 'modules' tab as an additional resource.

As a word for the final project, I highly encourage you to be creative and self-driven, **with a focus on spatial analysis**. You can reach out to the potential client and pitch your idea using this opportunity. The deliverable of this project can be valuable assets for your future career. However, students who choose this route should note that the professional and the class requirements are not necessarily co terminus! Students should discuss with me if unsure. The mid-semester review can be helpful in this respect.

3. Attendance/Participation Effort (5%)

- Attendance: Students must be in class to reap the full benefits of the course. A sign-in sheet will circulate the room each day to note your attendance. Material is presented cumulatively, so if you miss one week, you will be disadvantaged the following week. It is extremely important that you keep up!
- Participation: You are expected to pay attention during the lectures and work on the labs or homework during the appropriate times. A present and engaged student body will contribute significantly to the 'peer-learning' effect crucial to learning a complex software package.
- Effort: Computers sometimes can be frustrating. However, losing it or taking it out on the TAs or instructor is not an acceptable response! This portion of the grade is not intended to punish students but to reward patient students who have a good attitude, are entrepreneurial, and use creative and innovative ways to problem solve, particularly when faced with an unfamiliar situation.

Each student is entitled to four excused absences. You must notify me before **the start of class** with the proper reason. Failure to do so is considered an absence. **There is no partial grade for attendance.**

4. Midterm Quiz (5%)

A midterm quiz is scheduled for Thursday, October 17th, and will cover the material up until that point. No make-up will be given, except under extraordinary circumstances. The exam is mainly to test your understanding of essential GIS concepts.

INCLUSIVITY STATEMENT

The Department of City and Regional Planning is committed to providing an atmosphere for learning that respects diversity. We are dedicated to providing a welcoming and supportive environment for everyone, regardless of background, identity and prior experience level. While working together to build this community we ask all members to:

- Use welcoming and inclusive language

- Be respectful of different viewpoints and experiences
- Gracefully accept constructive criticism
- Show courtesy and respect towards others
- Help each other - you may well learn something or reinforce your own skills in the process
- Use this opportunity together to discuss ways in which we can create an inclusive
- environment in this course and across the Cornell community

ACADEMIC INTEGRITY

Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work, except for final projects that are specifically structured as group endeavors. **While you can form study group for labs, your labs are individual assignments.** Direct quotations of other work(s) should be enclosed with quotation marks, with a citation afterward and page number of the work where available. When you rely substantially on another person's work without quoting from it directly, please use in text citations at the end of an appropriate section. Failure to provide complete and proper citations may constitute plagiarism, which violates the Cornell Code of Academic Integrity. If detected, plagiarism may result in a failing grade for the course.

The full text of the Cornell code of academic integrity may be found at:
https://cuinfo.cornell.edu/aic.cfm

STUDENT ACCOMMODATIONS

In compliance with the Cornell University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodation are to be made during the first two weeks of the semester, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with Student Disability Services to verify their eligibility for appropriate accommodations. You can find more information online regarding these resources at https://sds.cornell.edu/accommodations-services/academic

Cornell University SYLLABI STATEMENTS

Bias Reporting
If you have seen, heard, or experienced bias in any form you should make a report. This helps to track our culture, progress, and flag problematic behavior and can help in identifying patterns long term. A bias report is not a punitive action, and can be made anonymously. Since 2000, Cornell University has had a program to track bias that is occurring on all campuses in an effort to be proactive in creating an inclusive climate for all.

You can access resources or report incidents that are experienced or witnessed, in campus, university event or virtually using the Bias Reporting Portal at:

https://diversity.cornell.edu/our-commitments/bias-reporting-cornell

In addition to university-wide civil rights compliance, the Office of Institutional Equity and

Title IX (OIETIX) is responsible for collecting and tracking all reported bias activity that occurs at Cornell University that could potentially impact our commitment to diversity and inclusion, including all reports made by faculty, staff, students, and visitors to the Ithaca, Weill Cornell Medicine, and Cornell Tech campuses.

Office of Institutional Equity & Title IX
Students who experience sexual violence,sexual harassment, or discrimination based on gender or sexual identity are encouraged to report their experience to the Office of Institutional Equity and Title IX titleix@cornell.edu to explore formal and informal reporting options, and explore the support and resources available. Information shared in class assignments, class discussions, and at public events do not constitute an official disclosure, and faculty and staff do not have to report these to the Title IX Coordinator. Any other disclosure to faculty and staff needs to be reported to the Title IX Coordinator.

Nearly all faculty and staff members are legally required to disclose any reports of sexual misconduct to the Title IX Coordinator, and cannot guarantee confidentiality. Confidential resources are not required to disclose reports of sexual misconduct to the

Title IX Office. All students have the right to report to local law enforcement (Cornell Police, Tompkins County Sheriff, or New York State Police.) All students have the right to be protected by the University from retaliation for reporting an incident and to receive assistance and resources from the University.

More information at: https://titleix.cornell.edu

Religious Observances
Cornell University is committed to supporting students who wish to practice their religious beliefs. Students are urged to discuss religious absences with their instructors well in advance of the religious holiday so that arrangements for making up work can be resolved before the absence. Cornell's faculty are governed by the Faculty Handbook, which requires them to provide reasonable accommodations to students when their religious observance conflicts with exam-taking, class attendance, and other course-related requirements in compliance with New York State law. The Office of Spirituality and Meaning-Making (OSMM) maintains a religious accommodation website that is an extremely valuable resource for both students and faculty. If you have questions or concerns, you may call the OSMM office at 607.255.6002 or email Oliver Goodrich, Associate Dean of Students for Spirituality and Meaning-Making. You may also contact the Office of the Dean of the Faculty by email or by phone at 607.255.4843.

Students with Disabilities
Your access in this course is important to me. Please request your accommodation letter early in the semester, or as soon as you become registered with SDS, so that we have adequate time to arrange your approved academic accommodations.

■ Once SDS approves your accommodation letter, it will be emailed to both you and me. [Optional, if applicable to your course: It is your responsibility to also email your accommodation letter to [insert name and title].] Please follow up with [me, TA, etc.] to discuss the necessary logistics of your accommodations.

■ If you are approved for exam accommodations, please consult with [me, TA, course staff, etc.] at least two weeks before the scheduled exam date to confirm the testing arrangements.

■ If you experience any access barriers in this course, such as with printed content, graphics,

online materials, or any communication barriers; reach out to me or SDS right away.

■ If you need an immediate accommodation, please speak with me after class or send an email message to me and SDS at sds_cu@cornell.edu.If you have, or think you may have disability, please contact Student Disability Services for a confidential discussion: sds_cu@cornell.edu, 607-254-4545, sds.cornell.edu.

Code of Academic Integrity
Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work, except in the case of certain collaborative projects as designated by the professor.

Syllabus Change Policy
Except for changes that substantially affect implementation of the evaluation (grading), the activities and assignments described below will be subject to change at any time during the semester to allow class time and activities to maximize the course's benefit to the students, depending on their ongoing development and interests.

Documentation
Course work and activities may be captured and recorded to document course activities and/or progress. The documentation and display may include identifiable student images, voices, and likenesses.