

## **Geography 370 – 006 Introduction to Geographic Information**

Spring 2024 (Tuesday-Thursday, 11:00am-12:15pm)

Instructor: *Prof. Javier A. Arce-Nazario*

Office Hours: Tuesdays from 12:30-1:30pm at Carolina Hall 326 and by Zoom appointment on Mondays from 4:00-5:00pm.

Geographic data is everywhere, and it is used across a variety of research areas and business endeavors. This course will introduce you to the tools and methods needed to obtain, manage, interpret and display spatial data.

### **LEARNING OBJECTIVES**

At the end of this class, you will not only know how to create digital geographic information, but you will also know how to look critically at maps and remotely sensed imagery and how to evaluate the sources of data and the assumptions that were used to make them. Your goals should be to:

- understand how geographic data is represented, and be comfortable with the different data models and coordinate systems
- develop a skillset allowing you to design maps and carry out simple spatial analyses
- become proficient in basic operations with GIS/Remote Sensing software tools

### **RECOMMENDED READING**

See course website <https://gisunc.github.io/GEOG370Spring2024/>

### **PREREQUISITES**

This is an introductory course, so there are no prerequisites. Being patient and open-minded towards computers and technology will make your experience more pleasant.

### **COURSE WEBSITE**

Course information and materials, as well as announcements from the instructors, will be distributed via the UNC Sakai site and the course [Github page](#). These materials will be updated frequently. *You are also expected to check your UNC e-mail and the Sakai Announcements regularly.*

### **COURSE PLAN**

You will be required to read course material and watch videos related to theory and methods. The course webpage has the links to the Sakai resources with the data used in the videos. You need to be able to replicate what is done in the video, otherwise you will not understand how to complete the homework or the tests. The benefit of learning techniques with these step-by-step videos is that you can do them at your own pace and repeat them as many times as you want until you feel comfortable doing the exercise. If you do not practice the videos, do not expect to be able to do the homework or the practical tests. The professor and the TA are always happy to help during recitation/office hours; however you should demonstrate that you have attempted the videos before you ask for help with the technical aspects of a homework or test.

### **CLASSROOM ETIQUETE**

Be respectful: please be silent while the professor or another student is speaking. When discussing in small groups, be prepared to quickly return your attention to the professor.

Communicate: Your instructor has a strong Boricua accent, so please feel free to ask him to repeat something if you do not understand him. He will not be offended; it is part of his identity.

Be timely: Please do not arrive late to class, and if you are late, take your seat without disturbing others (arriving more than 15 minutes late is equivalent to missing a session).

Carefully follow the UNC Covid standards.

## **REQUIREMENTS & GRADE BREAKDOWN**

### **Theory quizzes (15%)**

Students will take four tests during the scheduled lecture time covering the theory discussed in class and in reading. The theory will be assessed using a combination of multiple choice and short-answer questions. The lowest grade of the four quizzes will be deducted. There will be no makeup quizzes: if for any reason you miss a quiz you will get 0 on that quiz.

### **Practical quizzes (15%)**

Students will take four tests during the scheduled lecture time covering the practical methods used to address questions in geographic information. Students' comprehension of applied techniques will be evaluated through exercises that require them to create a particular type of map or geographic data analysis, using the techniques presented in class. The lowest grade of the four quizzes will be deducted. There will be no makeup quizzes: if for any reason you miss a quiz you will get 0 on that quiz.

### **Final exam (15%)**

During the official final exam time, students will be tested on all the theory and applied techniques discussed in class.

### **Homework and presentations (45%)**

Most of the student's comprehension of the material will be assessed through homework which will be shared and presented to the rest of the class. Students will create unique maps or analyses that they will share with other students. This is a very valuable part of the class, as other students learn about data and resources from other students, and the professor learns the interests of the students and can give direct feedback. The instruction and the deadlines for [the 10 homework exercises](#) can be found on the [course webpage](#). Late homework will not be accepted. It is important that you verify that you sent (via Sakai) the correct data, and that if you send a link to a homework assignment, that the resources in the link are public and that all the information can be accessed from the web. You are allowed to miss one homework without penalty, with the exception of HW10 (remote sensing presentation) and HW7 (creative map). If you complete all

homework, the lowest grade of all the homeworks (with the exception of HW7 and HW10) will be deducted.

At least 50% of your grade will be deducted from your homework if you do not show up to the presentation session. During the presentation session, be ready to explain how you did your homework and discuss the decisions that you made when designing the map.

### **Participation, leadership and collaboration (10%)**

It is expected that students will actively and respectfully participate in the class discussion, recitations, and presentations.

Your projects and assignments will be turned in electronically via Sakai. We will not accept homework or assignments submitted by email.

If for some reason your health or any other circumstances affect your ability to actively participate, please let the professor know about the situation as soon as possible.

Artificial Intelligence (AI) tools, such as chatGPT, are useful tools that can help in learning how to manage geographic information. However, AI is prohibited as an aid during testing and during completing your homework. If the professor or TA suspects that you have used an AI in any form to complete your homework, quiz or exam, you will receive a 0 on that assignment. You will be required to meet with the professor or TA during office hours and be evaluated on the subject in question. If the professor or TA suspects that you used AI during the final exam, you will receive an Incomplete in your grade and will be requested to take an oral examination with the professor, possibly during the following semester. If the TA and professor has clear evidence that you used AI, you will get an F in the class.

Students taking this course agree to abide by the provisions of the University of North Carolina at Chapel Hill Honor Code.

**Final grades** will be assigned using the UNC plus/minus letter grade system:

A (93-100) A-(90-92.9) B+(87-89.9) B(83-86.9) B- (80-82.9) C+ (77-79.9) C (73-76.9) C- (70-72.9) D+ (67-69.9) D (60-66.9) F (<60)

Schedule: Check the [website](https://gisunc.github.io/GEOG370Spring2024/) for details on each section and deadlines.

<https://gisunc.github.io/GEOG370Spring2024/>

Day	Activity
Thu Jan 11 2024	Introduction to class
Tue Jan 16 2024	Introduction to data types and how we model the world
Thu Jan 18 2024	Work with HW1 and GPS
Tue Jan 23 2024	GPS
Thu Jan 25 2024	Practical Quiz 1
Tue Jan 30 2024	Projections
Thu Feb 01 2024	Projections pt 2

Tue Feb 06 2024	Theory Quiz 1
Thu Feb 08 2024	Discuss Theory Quiz 1
Tue Feb 13 2024	No Classes
Thu Feb 15 2024	Georeferencing
Tue Feb 20 2024	Tables and Choropleths
Thu Feb 22 2024	Classification Schemes and Ratios
Tue Feb 27 2024	Theory Quiz 2
Thu Feb 29 2024	Discuss Quiz and apply classification and ratios to your data
Tue Mar 05 2024	Practical Quiz 2
Thu Mar 07 2024	Cartography
Tue Mar 12 2024	No Classes
Thu Mar 14 2024	No Classes
Tue Mar 19 2024	Vector Spatial Analysis
Thu Mar 21 2024	Vector Spatial Analysis Practical
Tue Mar 26 2024	Introduction to Rasters and to GEE
Thu Mar 28 2024	No Classes
Tue Apr 02 2024	Theory Quiz 3
Thu Apr 04 2024	Practical Quiz 3
Tue Apr 09 2024	Intro to remote sensing pt1
Thu Apr 11 2024	Intro to remote sensing pt2
Tue Apr 16 2024	Work on remote sensing presentation
Thu Apr 18 2024	Theory & Practical Quiz 4
Tue Apr 23 2024	Remote Sensing Presentation
Thu Apr 25 2024	Remote Sensing Presentation
Tue Apr 30 2024	Topography and elevation models
Check official calendar	Final Exam

### Homework Schedule

Homework	Deadline
<a href="#">Homework 1: Make your first map</a>	Fri Jan 19 2024 at 11:55 pm
Homework 2: GPS Data	Wed Jan 31 2024 at 11:55 pm
Homework 3: Projections	Wed Feb 07 2024 at 11:55 pm
Homework 4: Georeference a historical image	Wed Feb 21 2024 at 11:55 pm
Homework 5: Choropleth using Census data	Wed Feb 28 2024 at 11:55 pm
Homework 6 : Ratios and classification schemes	Wed Mar 06 2024 at 11:55 pm
Homework 7: Choropleth or proportional symbol map	Wed Mar 20 2024 at 11:55 pm

Homework 8: Vector spatial analysis	Wed Mar 27 2024 at 11:55 pm
Homework 9: GEE Intro to raster analysis	Wed Apr 03 2024 at 11:55 pm
Homework 10: GEE Short Presentation	Mon Apr 22 2024 at 11:55 pm

### **Syllabus Changes**

The professor reserves the right to make changes to the syllabus including project due dates and test dates. These changes will be announced as early as possible.

### **Attendance Policy**

**University Policy:** As stated in the University's [Class Attendance Policy](#), no right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences:

1. Authorized University activities
2. Disability/religious observance/pregnancy, as required by law and approved by [Accessibility Resources and Service](#) and/or the [Equal Opportunity and Compliance Office](#) (EOC)
3. Significant health condition and/or personal/family emergency as approved by the [Office of the Dean of Students](#), [Gender Violence Service Coordinators](#), and/or the [Equal Opportunity and Compliance Office](#) (EOC).

**Class Policy:** Instructors may work with students to meet attendance needs that do not fall within University approved absences. For situations when an absence is not University approved (e.g., a job interview or club activity), instructors determine their own approach to missed classes and make-up assessment and assignments.

**University Approved Absence Office (UAAO):** The [UAAO](#) website provides information and FAQs for students and faculty related to University Approved Absences.

**Note:** Instructors have the authority to make academic adjustments without official notice from the UAAO. In other words, it is not required for instructors to receive a University Approved Absence notification in order to work with a student. In fact, instructors are encouraged to work directly with students when possible.

### **Honor Code**

All students are expected to follow the guidelines of the UNC Honor Code. In particular, students are expected to refrain from "lying, cheating, or stealing" in the academic context. If you are unsure about which actions violate the Honor Code, please see me or consult [studentconduct.unc.edu](http://studentconduct.unc.edu).

### **Optional Mask Use Statement**

UNC-Chapel Hill is committed to the well-being of our community – not just physically, but emotionally. The indoor mask requirement was lifted for most of campus on March 7, 2022. If you feel more comfortable wearing a mask, you are free to do so. There are many reasons why a person may decide to continue to wear a mask, and we respect that choice.

### **Acceptable Use Policy**

By attending the University of North Carolina at Chapel Hill, you agree to abide by the University of North Carolina at Chapel Hill policies related to the acceptable use of IT systems and services. The Acceptable Use Policy (AUP) sets the expectation that you will use the University's technology resources responsibly, consistent with the University's mission. In the context of a class, it's quite likely you will participate in online activities that could include personal information about you or your peers, and the AUP addresses your obligations to protect the privacy of class participants. In addition, the AUP addresses matters of others' intellectual property, including copyright. These are only a couple of typical examples, so you should consult the full [Information Technology Acceptable Use Policy](#), which covers topics related to using digital resources, such as privacy, confidentiality, and intellectual property. Additionally, consult the University website "[Safe Computing at UNC](#)" for information about the data security policies, updates, and tips on keeping your identity, information, and devices safe.

### **Accessibility Resources and Service**

The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, including mental health disorders, chronic medical conditions, a temporary disability or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities. Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Website for contact information: <https://ars.unc.edu> or email [ars@unc.edu](mailto:ars@unc.edu).

### **Counseling and Psychological Services**

UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The [Heels Care Network](#) website is a place to access the many mental resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

### **Title IX Resources**

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/>. Please contact the University's Title IX Coordinator (Elizabeth Hall, [titleixcoordinator@unc.edu](mailto:titleixcoordinator@unc.edu)), Report and Response Coordinators in the Equal Opportunity and Compliance Office ([reportandresponse@unc.edu](mailto:reportandresponse@unc.edu)), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators ([gvsc@unc.edu](mailto:gvsc@unc.edu); confidential) to discuss your specific needs. Additional resources are available at [safe.unc.edu](http://safe.unc.edu).

### **Policy on Non-Discrimination**

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's [Policy Statement on Non-Discrimination](#) offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied.

If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (see contact info at [safe.unc.edu](http://safe.unc.edu)) or the [Equal Opportunity and Compliance Office](#), or online to the EOC at <https://eoc.unc.edu/report-an-incident/>.

### **Diversity Statement**

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve. I appreciate suggestions.

### **Undergraduate Testing Center**

The College of Arts and Sciences provides a secure, proctored environment in which exams can be taken. The center works with instructors to proctor exams for their undergraduate students who are not registered with ARS and who do not need testing accommodations as provided by ARS. In other words, the Center provides a proctored testing environment for students who are unable to take an exam at the normally scheduled time (with pre-arrangement by your instructor). For more information, visit <http://testingcenter.web.unc.edu/>.

### **Learning Center**

Want to get the most out of this course or others this semester? Visit UNC's Learning Center at <http://learningcenter.unc.edu> to make an appointment or register for an event. Their free, popular programs will help you optimize your academic performance. Try academic coaching, peer tutoring, STEM support, ADHD/LD services, workshops and study camps, or review tips and tools available on the website.

### **Writing Center**

For free feedback on any course writing projects, check out UNC's Writing Center. Writing Center coaches can assist with any writing project, including multimedia projects and application essays, at any stage of the writing process. You don't even need a draft to come visit. To schedule a 45-minute appointment, review quick tips, or request written feedback online, visit <http://writingcenter.unc.edu>.

### **Grade Appeal Process**

If you feel you have been awarded an incorrect grade, please discuss with me. If we cannot resolve the issue, you may talk to our departmental director of undergraduate studies or appeal the grade through a formal university process based on arithmetic/clerical error, arbitrariness, discrimination, harassment, or personal malice. To learn more, go to the [Academic Advising Program](#) website.