GEOG 3120: FUNDAMENTALS OF GIS

LECTURE: T/TH 8:00-9:15AM; LAB: TH 2-4:45PM

Instructor

Dr. Elizabeth C. Delmelle

Phone
704-687-5932

Email
edelmell@uncc.edu

Office Location
McEniry 419

Office Hours
Wed: 9:15-10:15am
Thurs: 1:45-3:00
Or by appointment

Teaching Assistant

Minrui Zheng

Email
mzheng2@uncc.edu

Office Location
McEniry 306 (CAGIS)

Office Hours
Wednesdays 2-4pm

COURSE OVERVIEW

This course is intended to provide students with an understanding of geographic information systems and science. It aims to provide both a theoretical and practical foundation of the subject. The theoretical portion will be covered by a course lecture and corresponding readings in the assigned textbook. The practical portion will be covered in weekly laboratory assignments using ArcGIS Desktop 10.4. The objectives of this course are as follows:

- Become proficient in the use of ArcGIS Desktop.
- Understand the theoretical underpinnings of the software, data structures, and analytical functions so that you may easily transfer knowledge from one software package to the next or one upgrade to the next.
- Be able to apply GIS functions to solve a variety of spatial problems (beyond map makers, analysts).
- Have the skills to perform your own GIS-related project from start to finish, independently after the course is completed.
- Be exposed to a wide range of applications for the use of GIS

TEXTS

Recommended:

Introduction to Geographic Information Systems, KANG-TSUNG CHANG

Other readings will be provided on Canvas. Please follow along.

COURSE MATERIALS

ArcGIS 10.4 from ESRI (Environmental Systems Research Institute, Redlands, CA) is used as the primary software to illustrate the GIS concepts. The software has been installed on computers in the McEniry 420 computer lab, and is also available on other computer labs across campus. I will provide each of you with a DVD containing a 1 year education license of the software for installation on your own personal computer. Please note that neither the TA nor I are responsible for technical assistance with this version of the software.

COURSE REQUIREMENTS

Lab Exercises: A series of laboratory exercises will provide hands-on experience that will help you understand major GIS operations. Students can expect to become proficient in the use of ArcGIS upon completion of this course. All data for the labs will be available on a .zip file and all lab instructions are downloadable from the course website on Canvas. The first labs will contain step-by-step instructions, a challenge exercise for you to apply your knowledge and a set of questions to be answered. The final lab is a "Lab Challenge" where

you will have 2 weeks to work through an entire project from obtaining data to performing a specified analysis.

Labs will be assigned approximately every week (Thursday) and will be due no later than 8:00 am the following Thursday. Late assignments will be penalized as follows:

- Up to 1 day late (24h): - 25%
- 1 day – 2 days late: -50%
- More than 2 days late: No longer accepted

Please try to plan ahead if you have a field trip or other commitment. In the case of a medical condition, please provide proof from a doctor. For other personal problems that may prevent you from turning in the lab on time, please contact me as soon as possible.

It is **HIGHLY** recommended that you work on the lab assignments during the designated lab section. This will afford you the greatest opportunity to ask questions to the TA and to communicate with other classmates. If you choose to work on the labs on your own**, please be respectful of the TAs office hours;** she will not provide endless help via email. Attempting to work on your lab during the lecture is a recipe for failure and will make your professor very grumpy!

Attendance: Is mandatory for each class from beginning to end. To ensure that you are there and paying attention, there will be a near daily quiz given each day at the start of class (see below) on material from the previous class. If for some unfortunate reason you miss a class, it is your responsibility to meet with me to catch up on the material. Many days I give handouts or short assignments in class that are key for your mastery of the material. Please be sure to find out what you missed.

Quizzes: There will be 22 short quizzes given at the start of most class. These range from 2 to 4 points (1 or 2 questions) based on the material covered in the previous class. 2 points will be given for a correct answer while 1 point will be given for an incorrect answer. Students must be present in class to receive any points. I will drop your two lowest quiz grades with no questions asked. If you wish to make-up a missed quiz, you must have an excused absence including a note from a doctor for medical reasons or a religious observation that I was notified about in advance (you are allowed two of these per semester).

Exams: There will be one midterm exam and one final exam.

GRADING

Task	Number	Grade Points
Quizes	22	2 - 4 each (44-88 points total)
Midterm exam	1	50 points
Exercises	9	15 points each /135 points total
Final exam	1	50 points
Lab Challenge	1	50 Points

Scale: A: 90-100%, B: 80-89.5%, C: 70-79.5%, D: 60-69.5%, F <60%

TENTATIVE COURSE SCHEDULE

Week	Date	Subject	Quizzes
1	T 8/22	Course Introduction	
1	TH 8/24	Fundamental GIS Concepts	Quiz 1
1	TH 8/24	*No Lab This Week*	
2	T 8/29	Getting to Know ArcGIS Desktop, A tour	Quiz 2
2	TH 8/31	ArcGIS Continued	
2	TH 8/31	*Lab 1: Fundamentals of ArcGIS Desktop*	
3	T 9/5	Projections & Coordinate Systems	Quiz 3
3	TH 9/7	Projections in GIS	Quiz 4
3	TH 9/7	*Lab 2: Map Projections & Coordinate Systems*	
4	T 9/12	Vector Data Model	Quiz 5
4	TH 9/14	Digitizing, Editing, Geodatabase Topology	Quiz 6; Ex 2 DUE
4	TH 9/14	*Lab 3: Vector Data Input, Editing, Errors*	
5	T 9/19	Sources of Data\Metadata\FGDC	Quiz 7
5	TH 9/21	Database & Attribute Management	Quiz 8
5	TH 9/21	*Lab 4: GPS Fun*	
6	T 9/26	Understanding GIS Queries	Quiz 9
6	TH 9/28	Database & Queries Continued	Quiz 10
6	TH 9/28	*Lab 5: Working with tables and spatial query*	
7	T 10/3	Midterm Review\Catch Up	Quiz 11
7	TH 10/5	Midterm Exam	
7	TH 10/5	*No Lab This Week*	
8	T 10/10	No Class – Fall Break	
8	TH 10/12	Vector Data Analysis	
8	TH 10/12	*Lab 6: Vector Analysis*	
9	T 10/17	Raster Data Model & Georeferencing	Quiz 12
9	TH 10/19	Raster Analysis	Quiz 13

9	TH 10/19	*Lab 7: Raster Analysis*	
10	T 10/24	Terrain Analysis & Viewshed	Quiz 14
10	TH 10/26	Terrain Analysis Continued	Quiz 15
10	TH 10/26	*Lab 8: Terrain Analysis*	
11	T 10/30	Spatial Interpolation & Kernel Density	Quiz 16
11	TH 11/2	Cont.	Quiz 17
11	TH 11/2	*Lab 9: Spatial Interpolation/Kernel Density*	
12	T 11/7	Suitability Analysis	Quiz 18
12	TH 11/9	Model Builder, Site Suitability Example	Quiz 19
12	TH 11/9	*Final Lab Challenge Assigned*	
13	T 11/14	Geocoding & Network Analysis	Quiz 20
13	TH 11/16	Network Analysis Continued	Quiz 21
13	TH 11/16	*Work on Lab Challenge*	
14	T 11/21	SEDAAG – Work on Lab Challenge	
14	TH 11/23	Thanksgiving, No Class	
15	T 11/28	Watersheds	Quiz 22
15	TH 11/30	Watersheds Continued	Lab Challenge Due at 4:45
16	T 12/5	Final Exam Review	
17	T 12/12	Final Exam – 8:00-10:30am	

ETHICS

If you are contemplating an ethical failure please read the code of student academic integrity: http://www.legal.uncc.edu/policies/ps-105.html, so you can plan for the consequences. Students are encouraged to work on their own and helping each other understanding the concepts is fine. You may work with other students on lab assignments but you may not copy projects or written answers to questions from another student.

STUDENTS WITH DISABILITIES

Students in this course seeking accommodations to disabilities must first consult with the Office of Disability Services and follow the instructions of that office for obtaining accommodations.

EMAIL POLICY

I will do my very best to get back to you within 24 hours of your email. Please do not utilize email as a substitution for coming to office hours. I will not explain concepts, go over the study guide the night before

the exam, or trouble-shoot your computer glitches via email. These are all best solved with an in-person visit. Finally, do not email me just before final grades are to be submitted to negotiate your grade. This is not a bartering system; letter grades will be assigned according to the aforementioned grading system. It is non-negotiable.