

Introductory GIS

Spring 2020

(3 credits)

Instructors:

Lu Liang E-Mail: Lu.Liang@unt.edu
Chetan Tiwari E-Mail: Chetan.Tiwari@unt.edu
Pinliang Dong E-Mail: Pinliang.Dong@unt.edu

OFFICE HOURS: By appointment.

Course Description and Objectives:

This is an introductory course covering the basics in geospatial science from theoretical concepts, data, models, analytical techniques, to practical usage, and applications. Topics will include: characteristics and structure of Geographic Information System (GIS) data; database construction; principles and methods in spatial analyst, including vector and raster data operation, spatial interpolation; mapping of spatial data; application of GIScience. This course will be accompanied with computer labs, and provided guidance to contemporary mainstream geospatial tools.

By the end of the semester, you are expected

- To understand basic geography and Geographic Information System (GIS) concepts.
- To incorporate multiple data types from a variety of sources using an industry-standard GIS software package.
- To build a strong foundation for advanced GIS classes and be able to incorporate analyses and mapping into other university courses and research projects.

Recommended TEXTBOOK:

There is no required textbook for this course. A book that you may find very helpful is: [Getting to Know ArcGIS](#)

Class Communication:

Except for class discussion, we encourage all course communications to be handled through a [help desk ticketing system](#). This will ensure you receive a prompt response from anyone of us (Instructors and TAs). **Please do not send emails to individuals**, unless it needs private attention. Otherwise, you will be redirected to the ticketing system.

Computer Resources:

All students will have copy of one-year software license that can be applied on your personal machine. Most on-campus public computers will not have ArcGIS software. If needed, we recommend you use CSAM computers (Room 336, 340 at [EESAT building](#)). **The door code is 1217# (for room 336) and 1217 (for room 340).**

TENTATIVE COURSE OUTLINE/SCHEDULE: (This weekly schedule is subject to change)

Week	Lecture	Lab / Quiz	Assignment Due dates
W0 1.6	Installing ArcGIS		Lab Assignment (peer-review) 1.19 11:59pm
W1 1.13	Introduction to GIS - Course expectation - GIS definition - ArcGIS versions and interface	Introducing ArcGIS - Table of Contents - Layer property - Identify features - Map interaction	1.26 11:59pm
W2 1.20	Data Models and Geodatabase - Vector - Understand Shapefile - Raster - Geodatabase	Symbolizing Features - Add data - Layer property - Identify features - Change point, line, polygon symbols	2.2 11:59pm
W3 1.27	Map Design - choropleth map - Map elements - Exporting maps - General principles in map design	Create Your First Map - Make symbology - Create a layout - Add map elements - Export map	2.9 11:59pm
W4 2.3	Attribute Data Structure - Field Data types: numbers, text, date - Table structure - Field option - Primary table operators: union, intersect	Classifying Features - Standard methods - Mapping density - Use graduated symbols	2.16 11:59pm
W5 2.10	Table Query / Attribute Query - Table query - Compound query (AND, OR, NOT) - SQL - Save and export selections	Table Query - Select by attributes - Sorting - Field calculator - Field statistics	2.23 11:59pm
W6 2.17	Table Join - Rational database - Key - Table join	Table Join - Join two tables - Select on a joined table - Save a copy - Add field and calculate	3.1 11:59pm
W7 2.24	Midterm		3.8 11:59pm
W8 3.2	Spatial Selection and Spatial Join - Select by location - Spatial Query types	Spatial Query & Spatial Join - Location-based query - Multi-frame map - Spatial join two layers - Labeling features	3.15 11:59pm
W9 3.9	Spring break		
W10	Map Projections		3.29 11:59pm

3.16	<ul style="list-style-type: none"> - Spheroid, Datum - Map distortion - Commonly used map projection - Projected Coordinate Systems 		
W11 3.23	Basic Spatial Analysis <ul style="list-style-type: none"> - General GIS spatial analysis procedure - ArcToolbox - Dissolve, Buffer, Clip, Intersect, Union, Erase - Suitability analysis (Overlay) 	Find potential campgrounds sites <ul style="list-style-type: none"> - Buffer - Overlay 	4.5 11:59pm
W12 3.30	Create and Edit Features <ul style="list-style-type: none"> - Editor tool 	Digitizing Aerial Photo in ArcMap <ul style="list-style-type: none"> - Edit attribute values - Modify feature geometry 	4.12 11:59pm
W13 4.6	Basic Raster Analysis <ul style="list-style-type: none"> - Commonly used raster types - Conversion between vector and raster - Introduction to "Adv GIS" 		4.19 11:59pm
W14 4.13	Geocoding <ul style="list-style-type: none"> - Simple geocoding (add X, Y data) - Batch geocoding 		4.26 11:59pm
W15 4.20	GIS applications <ul style="list-style-type: none"> - Health GIS (Tiwari) - Business GIS (Rice) - Environmental analysis (Ponette) - Remote sensing (Dong) - Hydrological application (Hudak) - Raster-based archeology (Lisa) 		5.3 11:59pm
W16 4.27	Pre-finals Days		
W17	Final project submission		5.5 due

- Modules will be published every Friday 11:59 PM. E.g., Week 2 module will be published on Friday of Week 1.
- All labs (including lecture quiz, lab quiz, lab assignment) are due Sundays 11:59pm.

Grading:

Your grade for this course will be based on the following:

Category	%	Justification
Participation	2%	Students are required to watch all videos posted on Canvas. They are posted as assignments and each video is counted as one point (complete/incomplete). The total points will be scaled to 2 points in your final.
Lecture Quiz	18%	Lecture quizzes are based on the videos and readings of that week. We recommend you thoroughly view each video and text lesson before you complete the associated problem set. You will have two attempts and the last attempt will be graded. The time limit depends on the length of the quiz. Make sure you read each instruction before you start.
Lab Assignments	50%	<p>Each week you will do one lab assignment, which has two formats. One format is quiz-based, which are questions that require hands-on practices in GIS. That means, you will follow the lab instructions to achieve the answers. All answers are listed in the lab instructions as well. Make sure you write down all answers before you start the Quiz. You only have one attempt and unlimited time in submission before due date. Labs can be time consuming. Give yourself plenty of time to complete them.</p> <p>The second format is map-based assignments. Students will need to finish certain GIS procedures and come up with a map outcome. Grading rubric is listed for each such assignment. Please use the rubric as your check list to ensure high grades. You can have multiple attempts and only the last submission will be graded. Also note, map critique can sometimes be subjective. One TA will be assigned to grade all lab assignments per week to keep grading consistent. However, there may be circumstance that you experience slight variance in your map evaluation.</p>
Mid-term	15%	
Final project	15%	

Grading Scale:

A= 90 — 100

B= 80 — 89

C= 70 — 79

D= 60 — 69

F= 59 and below

All quiz-based assignments will be grades automatically and immediately. All map-based submission will involve manual grading, and we will strive to return grades within two weeks past the due date. Note that grades on the final project will be posted very close to the final grade submission deadline.

Late Work

We **DO NOT** accept any late work in this class. Running such a large class involves a detailed workflow for assigning assignments to TAs, grading, and posting grades. As such, work that does not enter into that workflow presents a major delay. All assignments must be submitted by the posted deadlines. If you have technical difficulties submitting the assignment to Canvas, [submit a ticket](#) immediately and **attach a screenshot of your technical issue with**.

If you have an emergency and absolutely cannot submit an assignment by the posted deadlines, we ask you to go through the Dean of Students' office regarding class absences. You may find information on contacting the Dean of Students with regard to personal emergencies [here](#). **Justifiable excuses here would involve any major unforeseen disruption to your classwork**, such as major illnesses, injuries, deaths, and births, all for either you or your family. Please send an email with proof of evidence (e.g., doctor's note). Note that for foreseen but unavoidable conflicts, like weddings, business trips, and conferences, you should complete your work in advance. Fevers or other minor illness should not be used as an excuse, since we are giving two weeks to do the assignments. If you have such a conflict specifically with the midterm or final, let us know and we'll try to work with you.

Academic Dishonesty:

According to the UNT catalog, the term "cheating" includes, but is not limited to: (a) use of any unauthorized assistance in taking quizzes, tests, or examinations; (b) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (c) the acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university; (d) dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s) (you cannot dual submit in this class from previous semesters or this semester); or (e) any other act designed to give a student an unfair advantage. Altering a returned test and claiming a grader or scanning machine made an error is also considered cheating. The term "plagiarism" includes, but is not limited to: (a) the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and (b) the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. Students caught cheating or plagiarizing will receive a "0" for that particular assignment or exam. The incident will be reported to the chair of the Department of Geography, who will handle the grievance procedure if you do not agree with the decision.

We'd also like to draw your attention to another form of academic dishonesty in this digital age: disseminate or search for assignment keys online. Some lines are: 1) **You may not copy any quiz or map from anyone else.** 2) **You may not post any course material on a public platform.** This has been a rising issue. **Posts with questions and answers to exams and quizzes or answers to assignments are highly frowned upon and also constitutes a form of academic dishonesty to those who use the material.** 3) Although you are encouraged to discuss the course material and projects with your classmates, you may not collaborate with anyone at all on quiz or exams.

Disability Accommodation:

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at <http://www.unt.edu/oda>. You may also contact them by phone at 940.565.4323.

Extra Credit:

The Department of Geography does not allow extra credit assignments (work not specified on a course syllabus).

