



Geology 3401 – Interdisciplinary Geographical Information Systems

Fall, 2020

Class: TR 9:30-10:45, WSB 321

Lab M 2-5, W 2-5 WSB 310

Dr. Kevin Urbanczyk – WSB-314A, 837-8110, kevinu@sulross.edu

Office Hours: TWR 11-12, MW 9-10 and by appointment

Course description: A geographic information system (GIS) is a computerized information system that is designed to integrate various types of spatial and nonspatial data for a particular area and application. It is a “thematic” map database in that it allows for various “themes”, or layers of data types, to be superimposed upon each other. The resultant thematic map can then be printed, published to the internet, and/or analyzed for specific, generally spatial related, queries.

This class is designed to introduce the fundamental concepts of maps and GIS, and to provide the student with experience in utilizing one of the standard desktop GIS packages: ESRI’s ArcGIS. The class is “interdisciplinary” – the application of a GIS is only limited by the imagination and experience of the individual. The only prerequisite is basic computer skills. Typical applications of a GIS include: earth science, range management, ecology, hydrology, geography/urban planning, business management/trend and market analysis, sociology, archeology, and law enforcement.

Texts:

Price, Maribeth, Mastering ArcGIS Pro, 1st edition, McGraw-Hill ISBN 978-1-260-58733-3

Conduct: Students are expected to observe the University’s Code of Student Conduct (see Student Handbook, <http://www.sulross.edu/pages/3633.asp>).

Please turn OFF all cellular phones, IPODs, MP3s, etc.; No tobacco products allowed in class.

Expected Learning Outcomes/Objectives: Upon completion of this course, students will apply critical reasoning and problem solving skills to: 1. Understand the basic concepts of the GIS system; 2. Create ArcMap projects using readily available data types; 3. Create vector GIS data from GPS and from onscreen editing; 4. Manipulate raster based GIS data; 5. Perform spatial analysis using geoprocessing skills; and 6. Prepare output of these data and analyses

Methods of Assessment/Evaluation: Learning outcome assessment will be made on the basis of weekly quizzes, periodic homework assignments/project, weekly lab exercises, two lab exams, three lecture exams. The exams will assess the application of critical reasoning and problem solving skills through short answer questions, multiple choice questions, and essay type questions. The graded exams will be reviewed, by discussing the logic of the answers to and content of the questions missed by a majority of the class. The quizzes are designed to encourage students to read the assigned material in advance of the lectures, homework assignments will assess student problem solving skills in applying, describing, and explaining principles of GIS.

The optional project will be a cooperative effort to produce data for a local entity such as the City of Alpine or the Sul Ross campus. The project will involve field data collection and lab processing. Examples include the collection of data on water meters, traffic signs, environmental concerns, or other.

	Points each	Number	Total	%
Quizzes / homework	5	15	75	14%
Labs	10	12	120	22%
Lab midterm	25	1	25	5%
Lab final	25	1	25	5%
Exam 1	100	1	100	18%
Exam 2	100	1	100	18%
Exam 3	100	1	100	18%

The final grade scheme is based upon the standard 90-100 = A, 80-90 = B, 70-80 = C, 60-70 = D, and <60 = F.

week	date	Topic	Lecture Reading	Lab
1	8/25	Introduction	1	Lab history, Our hardware / software / GIS data
2	8/27	GIS Components		
	9/1	What is GIS?	2	ArcGIS overview
3	9/3			
	9/8	Mapping GIS data	3	Symbology/Features/Classifying Data
4	9/10			
	9/15	Presenting GIS data	4	Creating layouts, now we can have so many
5	9/17	Exam 1		
	9/22	Coordinate Systems	5	If only the world was flat ...
6	9/24			
	9/29	Managing vector data		Lab midterm
7	10/1			
	10/6	Managing raster data	6	points, lines and polygons
8	10/8			
	10/13	Attribute Data	7	look at all of the pretty grid
9	10/15			
	10/20	Editing	8	that other part of a feature
10	10/22			
	10/27	Queries	9	modify/create your own GIS
11	10/29			
	11/3	Exam 2	10	ask questions about your data
12	11/5			
	11/10	Joins and overlays	11	connect, extract look for coincidence
13	11/12			
	11/17	Raster analysis	12	analyze in the raster world
14	11/19			
	11/24	Raster analysis		
	11/25	Thanksgiving		
15	12/1	Sharing		LAB FINAL
	12/7	Final Exam - Monday 8 AM		

Distance Education Statement: Students enrolled in distance education courses have equal access to the university's academic support services, such as Smarthinking, library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login information to verify students' identities and to protect students' information. Proctored exams will be scheduled with the Mr. Giles in Midland. The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website.

Americans with Disabilities Act: Sul Ross State University is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartz, M. Ed., L.P.C., in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8203 8691. E-mail: mschwartz@sulross.edu

Fall 2020 In-Person Classroom Protocols *(Subject to Change)*

- 1) **Masks:** Face coverings are required indoors and outdoors on SHSU campuses unless you are in a private space or are engaged in an activity for which wearing a covering is impractical. In this class, if a student refuses to wear a mask/wear a mask properly, class will be cancelled, and according to SHSU policy, I will be forced to report the student to the Dean of Students office. Please note that a face mask that has an exhalation valve or vent is not acceptable. <https://www.shsu.edu/katsafe/face-coverings#2d0290a3-7bfe-4a69-9bab-14fb494c332b>
- 2) **Assigned Seating:** There will be an assigned seating chart for each group to encourage social distancing.
- 3) **Disinfection of Classroom Surfaces:** Each person should disinfect their space at the beginning and end of each class meeting. The university has provided disinfectant wipes in our classroom. When you enter the classroom, please take a wipe and use it to clean your space before settling in. If possible, please keep that wipe to use again to clean your space before you leave. Although, SHSU will provide access to hand sanitizer at the entrances to classroom buildings, I encourage you to also carry your own sanitizer with you in public.
- 4) **Orderly Dismissal:** When class is over, I will dismiss students row by row, starting with the row closest to the exit. Each day, I will end class a little early so that you have enough time to wipe down your desk and wait to be dismissed by row.
- 5) **Food & Drinks:** There will be no eating or drinking in the classroom. If you need to take a sip of your drink during class time, you may leave the room to do so.
- 6) **Paperwork:** In order to maintain social distancing and reduce the transmission of germs via paper, all paperwork requiring faculty signatures should be sent as digital documents via email, e.g., athletic schedules, doctor's notes, SSD forms, etc. I will not pass out any papers to students and I will not accept any papers from students.
- 7) **Limited in-class interaction:** We will do our absolute best to maintain social distancing in the classroom. Please stay 6 feet away from my desk. I will be happy to answer general questions during class time, but I recommend that you address personal questions virtually.
- 8) **No in-person office hours.** My office is not large enough to accommodate the CDC's recommendations for social distancing; therefore, all office hours will be held virtually.

9) **Travel:** *If you have travelled internationally, you are required to self-quarantine for 14 days upon your return. If you have travelled locally or out of state, you are required to self-quarantine for 14 days only if the local destination or state you traveled to is under a CDC COVID-19 travel advisory.*

<https://www.shsu.edu/katsafe/restart2020/faq#b73e7b75-e764-44b3-a404-66f4d498f0f6>

10) **Illness:** Students who are experiencing COVID-19 symptoms, have been diagnosed with COVID-19, or have been in close contact with a person who has been diagnosed with COVID-19, PLEASE DO NOT COME TO IN-PERSON SESSIONS. <https://www.shsu.edu/katsafe/covid-19-protocols>

If you have tested positive for COVID-19, please self-report via the "Restart 2020" SHSU web page. Go to <https://www.shsu.edu/katsafe/restart2020/> and click on the link on the right titled "Report Your Positive Case" (alternatively, you may contact Erica Bumpurs directly at stdemb17@shsu.edu).

Students who are symptomatic or who have had known exposure to COVID-19 may be tested at the Student Health Center.