South Dakota State University

GEOG 473/573 - S01, 3 credits
GIS Data Creation & Integration
Course Syllabus (Fall 2022)

Instructor:	Dapeng Li, Ph.D., GISP
Meeting Time:	Tue. 4:00 - 5:50 pm
Meeting Location:	Wecota Hall, Room 100
Office Hours:	Tue. & Thur. 2:00 - 4:00 pm (or by appointment)
Office:	Wecota Hall 115D
Phone:	(605) 688-4620
Email:	dapeng.li@sdstate.edu (primary contact)
Zoom:	https://sdstate.zoom.us/my/lidapeng

Lab Section

SECTION	LAB INSTRUCTOR	DAYS	LOCATION	MEETING TIME
473/573L S01	Madison DeJarlais	Thur.	Wecota Hall 014	4:00 PM – 5:50 PM

Lab Instructor

Name	Email
Madison DeJarlais	madison.dejarlais@jacks.sdstate.edu

Course Description

This course focuses on how to create, collect, process, manage, and analyze spatial data for a specific project. Specifically, the following topics are covered: basic concepts and principles of GIS, different types of spatial data, GIS data modeling, GIS Data collection, mapping, spatial data analysis, and spatial databases. Meanwhile, this course also aims to help students develop skills in ESRI ArcGIS Pro through the lab section and a final project.

Course Prerequisites

GEOG 372 Introduction to GIS or equivalent course/experience

Instructional Methods

Lecture, discussions, demonstrations, lab assignments, final project, presentation, quizzes/exams.

Student Learning Outcomes

Knowledge Outcomes

Upon the completion of this course students will be able to:

- Master the fundamental concepts and principles of GIS.
- Learn how to use GIS to collect/create, process, manage, analyze and visualize spatial data for a specific real-world application.
- Understand the personal implications of knowing about GIS.

Skills Outcomes

Students will develop the following skills:

- Assess the quality of various GIS data
- Use GIS in real projects
- Know how to keep on learning about GIS after the course is over.

Other skill outcomes include written communication, interpersonal communication, professional presentation, and planning and organization. Lastly, students are expected to be more interested in using GIS in their research/work after taking this course.

Course Requirements

Required Text

Bolstad, P. (2019). *GIS Fundamentals: A first text on geographic information systems* (6th edition). XanEdu Publishing Inc. (ISBN: 978-1593995522)

Optional Readings

Burrough, Peter A., and Rachael A. McDonnell. 1998, *Principals of Geographical Information Systems*. New York: Oxford University Press.

DeMers, M. N., 2009. *Fundamentals of Geographic Information Systems*. 4th edition. New York, N.Y.: John Wiley & Sons, 443 pp.

Jensen, John R., and Ryan R. Jensen.2012. *Introductory geographic information systems*. Pearson Higher Ed (ISBN: 978-0136147763)

Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). *Geographic information systems and science* (4th edition). John Wiley & Sons.

(Other readings may also be assigned and will be provided accordingly.)

Lab Materials

Students will also need (at least) an 8 GB Flash Drive to store their lab and final project materials. All the data on the lab computers will be automatically wiped out when the computers are rebooted. SAVE YOUR FILES!!!

Attendance Policy

Attendance and full participation in classes is expected of all students. Attendance will be checked periodically. The class participation credit is given based on class attendance and/or in-class/take-home exercises.

Make-up Policy

If a student misses an exam, points can only be made up if the student has an excused absence. To be considered an excused absence, the student must contact the instructor with a legitimate excuse prior to the day of the exam.

Classroom Policies

- All cell phones need to be turned off or silenced during the class/lab.
- No recording (photos, audio, etc.) without permission.
- Using computers/smartphones to surf the internet or work on other tasks is not allowed.

Important Dates:

- August 22, Monday — First day of class
- September 1, Thursday — Last day to drop or add and adjust final fees
- September 2, Friday — "W" grade begins
- September 5, Monday — Labor Day Holiday
- October 9, Friday — First Half Fall Term ends
- October 10, Monday — Native American Day Holiday
- October 19, Wednesday — Deficiency reports due by midnight
- November 4, Friday — Last day to drop a course
- November 11, Friday — Veterans' Day Holiday
- November 23-27, Wed.– Sun. — Thanksgiving recess
- December 7, Wednesday — No classes; Final exam preparation
- December 8-14, Thur. – Wed. — Final exams
- December 19, Monday — Grades due by midnight

Evaluation Procedures

Grade Evaluation

Evaluation Components	Points (each)	Points	Percent Value
Participation	TBD	100	10%
Lab Assignments (10)	50	500	50%
Midterm Exam	50	50	5%
Final Exam	50	50	5%
Final Presentation	100	100	10%
Final Paper	200	200	20%
Total		1000	100%

Course Grade Scale

Grade	Final weighted points

A	90-100
B	80-89
C	70-79
D	60-69
F	< 60

Grading Policy

Weekly Lab: In the lab section, we will use ArcGIS Pro to reinforce the concepts covered in the lecture. We have one lab each week. Although class time has been allocated for lab tutorials and assignments, additional work may also be necessary. Attendance is required. Lab assignments must be submitted electronically through the Dropbox on D2L on time. The TA will grade the assignments, provide relevant feedback, and post the grades in D2L. Points may be deducted each day for late submissions (Please check the lab syllabus for more details).

Exam: This course has two exams. Each exam could include true/false questions, multiple choice questions, matching questions, short answer questions, and comprehensive essay questions. The questions come from the key points covered in the lecture, and a study guide will be given before each exam.

Final Project: The students are expected to use what they have learned in the class to accomplish a final project. The project is about compiling relevant data, organizing the data in a geodatabase, performing some analysis, and mapping out the results for a specific application. The project must be original work. Thus, the students are STRONGLY encouraged to discuss with the instructor regarding project ideas as early as possible.

Specifically, the final project should include the following components:

1. A 1-2 page summary of the project that introduces the topic and relevant research questions or objectives.
2. A project proposal that includes introduction, background, data, methods, and expected results. (within 8 pages (including figures), word count: 800~1,500 (undergraduate), 1,500~2,000 (graduate))
3. A PowerPoint presentation (about 15 minutes) that summarizes the key steps in the project.
4. A final paper that consists of title, introduction, background, data, methods, results, discussion, and conclusion (10 ~ 25 pages (double-spaced); word count: 2,000~3,000 (undergraduate), 3,000~4,000 (graduate)). APA format should be used in the final report, and students are strongly encouraged to use EndNote to manage the citations.

The instructor will provide timely feedback for each component. More details on each component will be provided during the semester. Please refer to D2L for specific due dates.

Class Participation: The course requires a regular attendance in BOTH lectures and labs. Student participation in class discussion and interaction is strongly encouraged. I will check attendance

periodically. The class participation credit is given based on class attendance and in-class/take home exercises/quizzes.

Course Schedule

Date	Lecture Topic	Readings	Lab
8/23	Course Overview	Syllabus & B Ch. 1	No Lab
8/30	Introduction to GIS	B Ch. 1	Lab 1: Intro to ArcGIS Pro
9/6	Data Models	B Ch. 2	Lab 1: Intro to ArcGIS Pro
9/13	Map Projections	B Ch. 3	Lab 2: Map Projections
9/20	Data Entry and Editing	B Ch. 4	Lab 3: Data Entry
9/25	1 –2 page extended abstract due by midnight		
9/27	Global Navigation Satellite Systems	B Ch. 5	Lab 4: Digitizing & Topology
10/4	Digital Data Sources	B Ch. 7	Lab 6: Digital Data & Tables
10/11	Tables and Relational Databases	B Ch. 8	Lab 7: Tables
10/18	Midterm Exam (4:00 – 6:00 pm)	N/A	Lab 8: Spatial Selection
10/25	Basic Spatial Analysis	B Ch. 9	Lab 9: Buffering & Overlay
11/1	Topics in Raster Analysis	B Ch. 10	Lab 10: Raster Analysis
11/6	Proposal due in D2L by midnight		
11/8	Terrain Analysis	B Ch. 11	Lab 11: Terrain Analysis
11/15	Interpolation and Spatial Estimation	B Ch. 12	Lab 12: Interpolation (Optional)
11/22	Geocoding & Reverse Geocoding	Li, 2018	No Lab (Thanksgiving)
11/29	Project Advising	N/A	Project Time
12/6	Final Project Presentation (Zoom)	N/A	No Lab
12/8	Final paper due in D2L by midnight		
12/9	Final Exam	By 6:00 pm on 12/9 (Friday) (Online in D2L)	
12/9	Final Project Presentation (Zoom)	4:00 – 6:00 pm, 12/9 (Friday)	

Abbr.: Bolstad (B)

This schedule is subject to change. Students will be notified of any changes.

ADA Statement

South Dakota State University strives to ensure that physical resources, as well as information and communication technologies, are reasonably accessible to users in order to provide equal access to all. If you encounter any accessibility issues, you are encouraged to immediately contact the instructor of the course and the Office of Disability Services (Phone: 605-688-4504; Fax: 605-688-4987; E-mail: Nancy.Crooks@sdstate.edu or DSU.Disabilityservices@sdstate.edu; Address: Room 271, Box 2815, University Student Union, Brookings South Dakota 57007)

Freedom in Learning Statement

Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any courses of study. Students who believe that an academic

evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should first contact the instructor of the course. If the student remains unsatisfied, the student may contact the Department Head, Dean, or both, of the college which offers the class to initiate a review of the evaluation.

Student Academic Integrity and Appeals

The University has a clear expectation for academic integrity and does not tolerate academic dishonesty. University Policy 2:4 sets forth the definitions of academic dishonesty, which includes but is not limited to, cheating, plagiarism, fabrication, facilitating academic dishonesty, misrepresentation, and other forms of dishonesty relating to academics. The policy and its procedures also set forth how charges of academic dishonesty are handled at the University. Academic Dishonesty is strictly proscribed and if found may result in student discipline up to and including dismissal from the University.

TurnItIn

All written assignments in D2L will be automatically submitted to TurnItIn for plagiarism detection. Students should make sure that the assignments are their original work before they submit them in D2L. Students should check the similarity score of their submitted documents to ensure that the assignments pass the test.

COVID-19 Class Attendance Policy

Students who are experiencing symptoms of COVID-19, engaging in self-quarantine, or are in isolation based on a positive COVID-19 test, should not attend in-person classes. For those absences, students shall not be required to provide formal documentation, nor shall they be penalized, but they must confer with their instructors to determine whether remote participation, an Incomplete grade, or withdrawal is most appropriate.

Students who are absent due to experiencing COVID-19 symptoms, engaging in self-quarantine, or in isolation due to a positive test, shall

- notify instructors of their absence in a timely manner, in advance if possible;
- participate in synchronous and asynchronous online learning activities, as able;
- keep up with coursework, as able; and
- work with instructors to reschedule online or on-campus exams, labs, assignments, and other academic activities, as needed.