South Dakota State University

GEOG 576 Web GIS, 3 Credits
Course Syllabus (Fall 2019)

Course Instructor: Dapeng Li, Ph.D., GISP

Meeting Time: Mon. 2:00 - 3:50 PM

Meeting Location: Wecota Hall, Room 014

Office Hours: Tue. 2:00 - 4:00 PM (or by appointment)

Office: Wecota Hall 115D

Phone: (605) 688-4620

Email: dapeng.li@sdstate.edu (primary contact)

Lab Section

The lab portion of this course will be in the GIS lab (Wecota Hall 014). Note that Wecota Hall will be locked on weekends and after 5:00 pm on weekdays. Please schedule your time to use the GIS lab during the daytime on weekdays.

Course Description

This course is covers the use of GIS in the web environment. Specifically, this course covers the following aspects: basic concepts and principles of Web GIS, Web GIS design and implementation, Web GIS applications, etc. Meanwhile, this course also aims to help students develop some practical skills in Web GIS using JavaScript, CSS, HTML, and ArcGIS products.

Course Prerequisites

GEOG 372: Introduction to GIS (or equivalent course/experience).

Instructional Methods

Lecture, discussion, lab exercises, assignments, training sessions, final project, presentation, quizzes/exams.

Course Schedule

Date	Lecture Topic	Readings	Lab
8/26	Course Overview	Syllabus	Lab Overview (Software)
9/2	**No Class (Labor Day Holiday)**	FS Ch. 1, F Ch. 1	Determine discussion topics
9/9	GIS in the Web Era	FS Ch. 1, F Ch. 1	Lab 1: ArcGIS Online (F Ch. 1)

9/16	Technical Basics	FS Ch. 2, F Ch. 2	Lab 2: Feature Layers (F Ch. 2)
9/23	Geospatial Web Services	FS Ch. 3, F Ch. 3	Lab 3: Web AppBuilder (F Ch. 3)
9/30	Geospatial Mashups	FS Ch. 4, F Ch. 5	Lab 4: Image Layers (F Ch. 5)
10/7	Mobile GIS	FS Ch. 5, F Ch. 4	Lab 5: Mobile GIS (F Ch. 4)
10/14	**No Class (Native American Day)**	Study guide	Midterm Exam
10/21	Geoportals	FS Ch. 6, F Ch. 6	Lab 6: Web AppBuilder (F Ch. 6)
10/28	NSDI in the Web 2.0 Era	FS Ch. 7, F Ch. 7	Lab 7: 3D Web Maps (F Ch. 7)
11/4	Web GIS in E-Business	FS Ch. 8, F Ch. 8	Lab 8: Spatial Analysis (F Ch. 8)
11/11	**No Class (Veterans' Day)**	TBA	Project time
11/11	Final Project Proposal Due on 11/11 @ 11:00 pm		
11/18	Web GIS in E-Government	FS Ch. 9, F Ch. 9	Lab 9: Raster Analysis (F Ch. 9)
11/25	Hot Topics and New Frontiers	FS Ch. 10	No Lab (Thanksgiving Holiday)
12/2	Web GIS development	F Ch. 10	Lab 10: ArcGIS JS APIs (F Ch. 10)
12/9	Study Guide & Final Presentation	Study Guide	No Lab (Prepare for final exam)
12/11	Final Paper Due on 12/11 @ 11:00 pm		
12/12	Final Exam	1:45 – 3:45 PM, Wecota Hall 014	

Abbr.: Fu & Sun (FS), Fu (F)

Notes: This schedule is subject to change. Other assignments may also be added throughout the semester. Please always check the newest syllabus in D2L.

Course Requirements

Required Text

Lecture

Fu, P., & Sun, J. (2010). *Web GIS: principles and applications*. Esri Press.

Lab

Fu, P. (2018). *Getting to know Web GIS* (3rd edition). Esri Press.

Optional Readings

Web Development

Connolly, R. & Hoar, R. (2017). *Fundamentals of web development* (2nd edition). Pearson Education.

ArcGIS

Nasser, H. (2014). Building Web Applications with ArcGIS. Packt Publishing Ltd.

Pimpler, E., & Lewin, M. (2017). *Building Web and Mobile ArcGIS Server Applications with JavaScript: Build exciting custom web and mobile GIS applications with the ArcGIS Server API for JavaScript*. Packt Publishing Ltd.

Rubalcava, R. (2015). *ArcGIS Web Development*. Manning Publications Company.

Sheehan, M. (2015). *Developing Mobile Web ArcGIS Applications*. Packt Publishing Ltd.

Vijayaraghavan, J., & Dhanapal, Y. (2016). *ArcGIS for JavaScript Developers by Example*. Packt Publishing Ltd.

Open Source GIS Software

Iacovella, S. (2017). *GeoServer Beginner's Guide: Share geospatial data using Open Source standards*. Packt Publishing Ltd.

Iacovella, S. (2014). *GeoServer Cookbook*. Packt Publishing Ltd.

Youngblood, B. (2013). *GeoServer Beginner's Guide*. Packt Publishing Ltd.

Other readings may also be assigned and will be provided by the instructor 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 the class are required. Attendance will be checked periodically. The class participation credit is given based on class attendance and/or in-class/take-home exercises. Some points will be deducted for class absence.

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 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.
- If a laptop is used to take lecture notes, please sit in the back of the classroom.

Important Dates:

- August 26, Monday   First day of class
- August 28, Wednesday   First day of lab
- September 5, Thursday   Last day to drop or add and adjust final fees
- September 6, Friday   "W" grade begins
- October 18, Friday   First Half Spring Term ends
- October 23, Wednesday   Deficiency reports due on WebAdvisor by midnight
- November 8, Friday   Last day to drop a course
- November 27-December 1   Thanksgiving recess

- December 11, Wednesday   No classes; Final exam preparation
- December 12-18, Thur. – Wed.   Final exams

Overall Course Goals

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

1. Understand and recall the fundamental concepts and principles of Web GIS.
2. Develop a good understanding of the functionalities and potential applications of Web GIS.
3. Master the basic principles of Web GIS design and implementation.
4. Apply the knowledge learned in the class to design and implement a Web GIS for a specific application.

Student Learning Outcomes

Knowledge Outcomes

Students will master the basic concepts and principles of Web GIS and learn how to design and implement a Web GIS system for a specific real-world application.

Skills Outcomes

Students will **develop specific skills and competencies in Web GIS** and **learn to use Web GIS in real-world applications**. Students will use the methods learned in the class to complete a final project. Other skill outcomes include: written communication, interpersonal communication, professional presentation, and planning and organization.

Grade Evaluation

Evaluation Components	Points (each)	Total Points	Percent Value
Participation	TBD	100	10%
Lab Assignments	40	400	40%
Case Discussion	50	50	5%
Midterm Exam	100	100	10%
Final Exam	100	100	10%
Final Project Presentation	50	50	5%
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

Course Policies

Weekly Lab Exercises: In the labs, we will use ESRI ArcGIS Enterprise (ArcGIS Server) and ArcGIS Online to reinforce the concepts covered in the lectures. We have one lab (following the lecture) each week. The students will work on the lab exercises to develop their Web GIS skills. Although class time has been allocated for lab exercises, additional work may also be necessary. Lab assignments must be submitted electronically through the Dropbox in D2L on time. Certain points will be deducted each day for late submissions. The students are expected to memorize all the commands, procedures, and solutions they have used and develop their proficiency in Web GIS.

Case Discussion: Each student is required to choose a case (a Web GIS application) and lead the discussion during the class. Each discussion will last about 15~20 minutes. Case discussions will be graded, and more details will be given during the semester.

Exam: This course has two exams. The exams will 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 lab exercises, and a study guide will be provided before each exam. No "make-up" exams will be given without permission; please notify the instructor at least two weeks in advance of a scheduled exam date if an alternative date is necessary. If granted, students will be required to take the exam at the university testing center.

Final Project: The students are expected to use what they have learned in the class to accomplish a final project. The project is about designing and implementing a Web GIS 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 project proposal that includes introduction, background, data compilation, Web GIS design, and expected results. It should be within 10 pages (including figures). Word count: 1,500~2,000.
2. A PowerPoint presentation (about 15 minutes) that summarizes the key steps in designing and implementing the Web GIS as well as the applications of the Web GIS.
3. A final report that consists of title, introduction, spatial data compilation, Web GIS design, Web GIS implementation, results, discussion, and conclusion (within 25 pages (double-spaced); word count: 3,000~5,000).

More details on the final project will be provided during the semester. Please refer to the course calendar for specific due dates.

Class Participation: Attendance is required in this course. Student participation in class discussion and interaction is strongly encouraged. Attendance will be checked periodically. The class participation credit is given based on class attendance and in-class/take home exercises/quizzes.

ADA Statement:

Any student who feels s/he may need an accommodation based on the impact of a disability should contact Nancy Hartenhoff-Crooks (or successor) Coordinator of Disability Services (605-688-4504 or Fax, 605-688-4987) to privately discuss your specific needs. The Office of Disability Services is located in room 065 at the University Student Union.

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.