

WebGIS

GEOG 489

Instructor

Dr. Daniel Goldberg

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Office Hours: TTH 1:00pm-2:00pm
and by appointment

Teaching Assistants

Mr. Billy Hales

Sections 501, 502

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Office Hours: W 2:30-4:30

Meeting Time and Locations

Lecture

Time: T TH 2:20 – 3:35

Room: EDCT 215

Labs

501 – Monday 9:10 am – 11:00 am

502 – Wednesday 9:10 am – 11:00 am

All labs meet in Teague B009A

Class web site

Updates to the lecture and lab syllabi as well as other course materials will be made available on the course website. It can be accessed on ELearning at <http://ecampus.tamu.edu>.

Course Description

This class is an introduction to web-based Geographic Information Systems (WebGIS). This lab-oriented course covers server-oriented architectures and their application in creating web-based GIS applications and services. This course introduces students to web server, service, and database setup, management and utilization in the development of data-rich WebGIS applications.

Learning Outcomes

This course is designed to introduce students to the basics of producing, managing, and consuming web-based Geographic Information Systems (WebGIS) in the context of server-oriented architectures (SOA). Through hands-on experience, students will learn to setup, administer, and utilize industry-standard WebGIS platforms including Esri ArcServer and Microsoft SQL Server. This course will provide students with a solid foundation in the installation and use of WebGIS databases and services as well as a basic knowledge of how to utilize these in the development of web maps.

The course will start with an introduction to fundamental Internet architectures used in production-level WebGIS platforms. The course will next cover hands-on installation, publishing, and management of industry-standard WebGIS platforms, services, and data. Finally, students will learn and employ introductory JavaScript programming to integrate their WebGIS databases and services within custom-developed web-based maps using commercially-available and commonly-used web-mapping application programming interfaces (APIs). The course will include a lecture component where theoretical issues are covered and lab-based exercises where students have the opportunity to practice setting up, managing, and implementing these techniques and technologies.

At the end of this class, each student will be able to:

- 1) Identify a set of requirements for implementing WebGIS servers and services;
- 2) Setup and administer industry-standard WebGIS servers;
- 3) Publish and consume data and services to and from WebGIS servers;
- 4) Programmatically access GIS data and services from WebGIS servers and use these in the production of web-based maps; and
- 5) Conceptualize, design, plan, implement, and document a custom WebGIS solution to a real-world problem.

Textbooks and Readings

Lecture Texts

Fu P, Sun J, 2010. **Web GIS: Principles and Applications**. 1st ed. Redlands, CA, ESRI Press. 312 pp.

Additional readings and materials will be drawn from websites, handouts, and online resources.

GIS Software

This course will utilize the ArcGIS™ suite of software developed by ESRI including ArcServer and Python. Installable copies may be obtained from the instructor or teaching assistants.

Database Software

This course will utilize the Microsoft SQL Server™ suite of software. Installable copies may be downloaded from the Microsoft Dream Spark program available to TAMU students.

Development Software

This course will utilize the JavaScript, Python, and C# programming languages which can be developed with basic text editing software and/or with Microsoft Visual Studio which can be downloaded for free from DreamSpark

Class Attendance

The university views class attendance as the responsibility of the individual student. Information on University attendance rules can be found at <http://student-rules.tamu.edu/rule07>. As described below, a portion of each student's grade is based on in-class participation. This will be judged by the instructor as regular attendance and active engagement on a consistent basis that contributes to the class in some manner.

Lab attendance is required and considered essential for successful completion of the course.

Grading

Your grade in this class will be based equally on the lecture and labs as described below

A. Lecture	30%	
Midterm 1		10%
Midterm 2		10%
Final Exam		10%
B. Lab	40%	
Exercises		40%
C. Project	25%	
Project Proposal		5%
Project Presentations		5%
Final Project & Report		15%
D. Participation	5%	
Class Participation		5%

The grading scale for this course is as follows:

≥90% A, 80-89% B, 70-79% C, 60-69% D, <60% F

Final Project

Throughout the semester, undergraduate students will work in teams of up to 2 along with one or more graduate students to apply the WebGIS concepts learned in lectures with the hands-on experience gained in labs to solve a “real-world” problem using WebGIS. Each project will be based on the needs of a “customer” who will provide a project idea. Groups will be expected to meet with the “customer” regularly throughout the semester.

Proposal Pitches

Each graduate student will identify a “customer” who will provide a project idea. Each graduate student will present a 5 minute presentation of their idea for a project to the class. This will pitch will include enough details to recruit undergraduate students to work on the grad student’s project. Undergraduate students will choose project teams based on their willingness to work on the project pitched by the graduate student. Graduate students who receive an insufficient number of students to complete their project will work on another graduate student’s project.

Project Proposal

Each student group will submit a 1-page synopsis of the proposed topic and present a 5 minute description. This synopsis will include the problem the group will attempt to address including a set of requirements, the methods and data that will be used to accomplish their goals, and a development roadmap for implementing the project.

Project Presentations

Each student group will present their project three times. The first is the project pitch; the second is a project status presentation; the third is the final project presentation.

Project Deliverables

Each student group will a) host their project code and necessary data and set of WebGIS services and accompanying online maps, data, and/or services; b) deliver a report summarizing the problem they were trying to address, the tools and data used to accomplish their goals, and reflections on how well their implementation meets the requirements set forth; and c) demonstrate a hands-on working version of their prototype to the class during a project presentation.

Grading

Each student will be graded on the quality of the team project. In addition, each student’s grade will be based in part on a score they receive from their teammates evaluating their contribution to the overall project. Students are advised to consult with the teaching assistant and/or professor in advance if issues of team member performance becomes an issue.

Makeups

Makeups for the Exam and other work will be allowed only for University excused absences and will be administered in compliance with university rules. Excused absences are covered in the Texas A&M University Student Rules (<http://student-rules.tamu.edu>)

Labs

Labs are an important and integral portion of the course. There is simply no way to learn about WebGIS setup, programming, or maintenance without spending considerable time in lab working on with these data and services. While the scheduled lab time is two hours, labs will typically require time outside of the scheduled lab hours to complete.

Labs will be due at the beginning of the following lab unless otherwise indicated. **Late labs will not be accepted for credit.** It is your responsibility for keeping up with lab assignments. You should talk to your Teaching Assistant and or the instructor BEFORE late labs become a problem.

Homework Assignments

Small homework assignments will be assigned each week along with a series of online training documents which supplement the materials presented in class.

Homework assignments will be due as indicated on the homework assignment. **Late homework assignments will not be accepted for credit.** It is your responsibility for keeping up with homework assignments. You should talk to your Teaching Assistant and or the instructor BEFORE late homework assignments become a problem.

Scholastic Dishonesty

It is our hope that academic dishonesty will not be a problem in this class. Texas A&M does, however, have a *Scholastic Dishonesty* policy to which both students and faculty must comply. If you have any questions about the University's Scholastic Dishonesty policy please review the Student Rules or see me. The Aggie Honor program is the new program that will handle all cases of academic dishonesty. <http://aggiehonor.tamu.edu>

All materials used in this class are copyrighted. These materials include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, <http://student-rules.tamu.edu>, under the section "Scholastic Dishonesty."

"Aggies don't lie, cheat, or steal, nor tolerate those that do"

Cellular Telephones

As a courtesy to the instructor and other students please turn off all cellular telephones before the class begins.

Email

All Texas A&M students should use their Texas A&M University email accounts when emailing the instructor and teaching assistants. I may also send out class announcements via the University email system as well. It is your responsibility to check your official TAMU email account regularly.

Student Support

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall. The phone number is 845-1637.

Services for Students with Disabilities

Room B118 of Cain Hall, 845-1637 or on the web at <http://disability.tamu.edu/>

There are numerous other student support organizations on campus including

Student Counseling Service

Cain Hall, 845-4427, <http://scs.tamu.edu>

Student Counseling Helpline 5:00pm-8:00am: 845-2700

University Writing Center

Suite 1.214 of the Evans Library, 458-1455, <http://writingcenter.tamu.edu/>

Course Schedule (Tentative)

Week	Class	Class Topics	Exam	Project Assignment Due*	Lab	Training	Homework Assignment Due*	Reading
1	1/14	Introduction to the Class & WebGIS			Computer Forms	Code Academy HTML I		
	1/16	... Continued						Fu & Sun 1 - 2
2	1/21	WebGIS Environments & Architectures			Server Connections & Basic HTML & GitHub	Code Academy Javascript I	HTML	Fu & Sun 3
	1/23	... Continued						Fu & Sun 4
3	1/28	Languages, Data Structures & Data Types			Advanced HTML	Code Academy Javascript II	Javascript	
	1/30	- Proposal Pitches		Proposal Pitches				
4	2/4	WebGIS APIs			HTML & Javascript	Google Maps API	Javascript	
	2/6	... Continued						
5	2/11	Exam Review					Google Maps	
	2/13		Midterm I					
6	2/18	Exam Solutions, SQL Server & Data Modeling			Javascript, JQuery & Data			
	2/20	- Project Proposals		Proposal Presentations				
7	2/25	SQL Server & Data Modeling			Data-Driven Web Pages	W3Schools SQL	Javascript	
	2/27	... Continued						
8	3/4	(Arc)GIS Servers, Services, Mapping & ArcGIS.com			SQL Server Setup & Data Modeling	ArcGIS.com Guides	SQL	Fu & Sun 6 - 7
	3/6	... Continued						

I reserve the right to make changes to the course schedule

Course Schedule (Tentative)

Week	Class	Class Topics	Exam	Project Assignment Due*	Lab	Training	Homework Assignment Due*	
9	3/11	SPRING BREAK						
	3/13							
10	3/18	GeoProcessing Services			ArcServer Setup, Data Publishing & Use	ArcGIS.com Guides	ArcGIS.com	
	3/20	Exam Review						
11	3/25		Midterm II					
	3/27	Exam Solutions, ArcGIS Web APIs & Services						
12	4/1	ArcGIS Web APIs & Services			GeoProcessing Services Publishing & Use			
	4/3	- Project Status Presentations		Status Presentations				
13	4/8	- Project Preparation Time			ArcGIS Web APIs			
	4/10	- Project Preparation Time						
14	4/15	Future of WebGIS						Fu & Sun 5
	4/17	... Continued						
15	4/22	- Project Presentations		Final Presentation				
	4/24	- Project Presentations		Final Presentation				
	5/6	3:00 PM		Final Project Report				
	5/7	1:00PM - 3:00 PM	Final					

I reserve the right to make changes to the course schedule

Important Dates

January 13	Monday. First day of spring semester classes.
January 17	Friday. 5 p.m. Last day for adding/dropping courses for the spring semester.
January 20	Monday. Martin Luther King, Jr. Day. Faculty and Staff holiday.
February 14	Friday. Last day to apply for all degrees to be awarded in May without a late fee.
March 3	Monday. noon. Mid-semester grades due.
March 10-14	Monday-Friday. Spring Break.
March 13-14	Thursday-Friday. Faculty and Staff holiday.
April 10-25	Thursday-Friday. Preregistration for the 2014 first term, second term, 10-week summer semester, and fall semester.
April 14	Monday. 5 p.m.
	- Last day for all students to drop courses with no penalty (Q-drop).
	- Last day to change Kinesiology 198/199 grade type.
	- Last day to officially withdraw from the University.
April 18	Friday. Reading day, no classes.
April 21	Monday. Muster. Campus ceremony.
April 28	Monday. Prep day, classes meet. No regular course exams (except for laboratory and one-hour classes shall be given on these days.
April 29	Tuesday.
	- Last day of spring semester classes.
	- Last day to apply for all degrees to be awarded in May.
	- Redefined day, students attend their Friday classes.
	- Prep day, classes meet. No regular course exams (except for laboratory and one-hour classes) shall be given on these days.
April 30-May 1	Wednesday-Thursday. Reading days, no classes.
May 2, 5-7	Friday, Monday-Wednesday. Spring semester final examinations for all students.
May 8	Thursday. 6 p.m. Grades for degree candidates due.
May 9	Friday. Last day for May undergraduate degree candidates to apply for Tuition Rebate.
May 9-10	Friday-Saturday. Commencement and Commissioning.
May 12	Monday. noon. Final grades for all students due.
