SSCI 591 – Web GIS (Section 35771)
Course Syllabus Spring 2013

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Office Hours: (tentative) Monday – Friday 10am to 2 pm Pacific Time
Always available asynchronously via email. Also, available for synchronous chats via phone or Skype or Adobe Connect, audio or video most days and times *by prior arrangement* via email. Just get in touch!

Course Scope and Purpose

This course is designed as an introduction to Web GIS, to the programming concepts underlying construction and implementation of high quality web mapping applications. Instruction is provided in commonly used open source GIS and related programming tools for customizing web-based mapping applications, and development of distributed web services for GIS. In addition, an overview of common proprietary web mapping software like ERSI's ArcServer is provided, as well as an introduction to mobile GIS technologies.

In this course, you will gain an understanding of the basic concepts of programming web GIS applications, including integrating different types of spatial information into web-enabled GIS maps. We will cover many topics:

Web GIS Basics – This course focuses on the basics of Web GIS system architecture, geospatial web services and mashups. In addition, we'll explore the key elements of mobile GIS solutions, the functionality of geoportals and web 2.0 technologies, web mapping interoperability in terms of utilizing universal data standards such as OpenGIS and ISO standards, and the current state of e-business and e-government web mapping interests.

Software and Tutorials – These weeks contain a semi-structured hands-on introduction to the wide variety of open source and proprietary web-based mapping scripting environments and API's readily available today, through tutorials, exercises and virtual seminars.

Application Development – This is the hands-on portion of the course, where you'll undertake an independent project that includes planning and creating a simple Web GIS application, gathering and integrating data within it to support the intended capabilities, and implementing it on the web. The course then concludes with an overview of and the hottest new research frontiers and future trends in Web GIS.

Learning Outcomes

When you have completed this course, you will be able to:

- Critically assess the organizational benefits and challenges of developing Web GIS applications;
- Explain the difference between Web GIS, geospatial web services, mashups, mobile GIS solutions, geoportals, and how these are applicable to e-businnes and e-government;
- Evaluate current technologies or architectures that support Web GIS; and
- Design and implement an independent Web GIS application.

Course Formats

This a graduate level course, so you should expect this class to be both academically robust and intellectually challenging. As graduate students you are expected to engage with the information you are learning and to explore the heady cauldron of ideas, opinion, and analysis that describe our collective effort to thoroughly interrogate the subject at hand. Learning arises from active engagement with the knowledge found in our reading materials and with one another. As in any graduate class, the instructor's role is that of a guide who keeps you on this path of discovery and you will find that you will learn much from your fellow classmates. The challenge for us is to replicate such an academic experience within the milieu of "distance learning".

All course materials will be organized through Blackboard. The main theoretical concepts will be provided through course notes and assigned readings. Hands-on practical exercises will use various software products accessible over the Internet. Assignments will give students an opportunity to internalize and apply the concepts and theory learned from readings. Some assignments require student interaction, all will benefit from it.

We have several technologies that will facilitate our course work and our interactions, despite our dispersed locations. These include:

Blackboard – All course materials and correspondence will be posted on the course Blackboard site. As a registered student you'll find this course will show up in your available courses at noon Pacific Time on the first day of classes. It is here that the day-to-day flow of the course will be recorded.

Discussion boards and blogs – On the Blackboard site, we'll post a number of discussion threads relevant to various sections of the course. These are vitally important when we get to the hands-on work as we expect students to work "together" on these exercises, sharing hints and help as you would do in a common laboratory classroom. Other discussion threads are to be used to organize asynchronous discussions for all of you, the students. **These threads are mainly meant to be a forum for student-to-student discussion and collaboration. I may not be following these threads, so don't expect a quick answer if you decide to pose a question for me in these threads. Rather, if you want me to be involved you will need to shoot an email for me to do so.**

Live meetings and presentations - At USC, we use a browser-based service called Adobe Connect to create synchronous interaction sessions. With voice and webcam capabilities Adobe Connect can be used to share presentations and even our desktops between two or more people.

Individual meetings - While Adobe Connect can be used for one-on-one meetings, we generally find it's sometimes easier to use the free VOIP and chat technology, Skype (www.ksype.com) for individual chats.

Assessments

Your grade in this class will be determined on the basis of several different kinds of assessment. Each week, by Monday, we'll post a Weekly Assignment outlining the work you are expected to complete that week with the relevant due dates. Most submissions will be due on the Monday following the week in which they are assigned.

Readings Homework – 6 for a total of 25 points. These will focus on the theory portion of the course as presented in the weekly readings. Their objective is to help you evaluate and integrate the information you have acquired from the course readings. Some of these will involve discussions and collaborative work, some will be individual efforts, one early in the term will involve a one-on-one presentation to the instructor. *Late submissions will be docked one grade. No grade will be given for assignments turned in over one week late.*

Exercises – 6 for a total of 45 points. During the semester you are expected to complete selected online internet and web map scripting tutorials, according to instructional documents provided as part of this course. To demonstrate that you have completed each assignment, you will turn in links to your working web pages and applications, brief text answers to questions, or a quick copy of some digital output from the final part of the exercise such as a .jpg of the output produced at the final step.

Final Project – 4 components for a total of 30 points. The Final Project is your opportunity to integrate all that you have learned in the semester. In the Final Projects you will:

1. Plan a Web GIS application with simple capabilities or controls (i.e. zoom, identify) that serves a unique purpose or a specific audience.
2. Select and implement the Web GIS software of your choice in your production environment.
3. Collect appropriate spatial and non-spatial data relevant to your topic, and then integrate it into your Web GIS application.
4. Implement the user capabilities of your choice using your data.
5. Produce a final website that demonstrates your Web GIS application.

You are expected create an operational Web GIS application (web page with Web map), available via your production environment.

The Final Project will have 4 components:

1. Proposal (5 points) – one paragraph description of the site suitability question (300 words)
2. Technology & Data report (5 points) – a report on the software implemented and the spatial and non-spatial data acquired for the project (as long as needed, requirements provided in the project instructions)

3. Presentation (10 points) – consists of ~3-5 text slides presenting: the plan and purpose of the project, the Web GIS application; a description of the development and implementation of the application; issues encountered while completing the project; and a **live demo** of the Web application and/or one or more slides illustrating your Web GIS application (web page with Web map), it's capabilities, and the data you integrated within it.

4. Final report (10 points) – due within 1 week of the presentation to allow time for final revisions (1500-2000 words plus figures).

Requirements

Textbooks – The following book will be used in this course. The first is available from the USC Bookstore or online outlets such as Esripress.esri.com. Be sure to order your textbooks (paper copies) to arrive by the fastest method possible as you will need them immediately.

- Fu, P and Sun, J, et al, 2011. <u>Web GIS: Principles and Applications</u>, Redlands: Esri Press. (*referred to in this course as Fu&Sun*)

- Svennergerg, C, 2010. <u>Beginning Google Maps API 3</u>, Apress. (*referred to in this course as Svenner*). Available as a free download or online eBook from USC Libraries to students (as of January 2013).

Technology – There are several technology requirements:

- If you need ArcGIS for preparation and/or processing of spatial data you will use in your project, it is provided on-line via the GIST Server, you do not need to install it on your own computer.

- Every student must have a computer with a fast Internet connection (DSL at a minimum). Since we now serve the key software from the Server, you can use either a Mac or a PC.

- Every student MUST have a functional webcam for use whenever a presentation or meeting is scheduled.

Communications – This is a distance learning course, so most of our interactions will be asynchronous (not at the same time). All materials to be handed in will be submitted via the Blackboard Assessment link. I will also create at least one Blackboard (BB) discussion forum at the start of the semester and I may create and/or monitor additional BB discussion forums through which you can discuss course-related topics as well as assist each other with comments on the course assignments, exercises and projects as the need arises.

I will send via email through Blackboard any notices that are time sensitive. Please be sure that you read as soon as possible all email sent from Blackboard or from me. Also double check to be sure that mail sent from both the USC blackboard accounts and my email (jswift@usc.edu) does not go into your junk mail!

While I am usually on-line and will probably respond to emails from students very quickly, I will endeavor to respond to all email within 24 hours of receipt, aiming for no more than 36 hours delay. In the rare case when I expect to be off-line for more than 24 hours, I will post an announcement on the Blackboard site.

Your responsibility: It is each student's responsibility to stay informed about what is going on in our course. In addition to email about time-sensitive topics, any important

announcements will be posted on the Announcement page in Blackboard. Be sure to check these each time you log onto Blackboard.

Workload – This is a four credit, one semester course. Students should expect to spend 10-12 hours per week completing the work in this course.

Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. More information about academic accommodations based on a disability can be found at: http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to an instructor as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions can be found at: http://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/.

Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

Important Administrative Dates*

1/14:	Spring semester classes begin
1/21:	Martin Luther King Day, university holiday
2/1:	Last day to register and add classes
2/1:	Last day to drop a class without a mark of "W" and receive a 100% refund
2/18:	Presidents' Day, university holiday
3/18-23:	Spring recess
3/25:	Deadline to submit signed Approval to Submit form to the Graduate School**
4/1:	Deadline to upload thesis or dissertation manuscript**
4/12:	Last day to drop a class with a mark of W
5/3:	Spring semester classes end
5/4-7:	Study days
5/15:	Final Examinations end
5/17:	Commencement

*http://www.usc.edu/academics/classes/term_20131/calendar.html
**http://www.usc.edu/schools/GraduateSchool/current_thesis_dissert_03.html

Tentative Schedule

Week #	Week Begins	Theme	Week's Readings and Practice		Assessments	
			Reading	Hands-on	Homework Due this Week	Project Due this week
1	14-Jan	Introduction	1: Fu&Sun 1, Notes	Exercise 1		
2	22-Jan*	Web Page Basics	2: Article, Notes	Exercise 2	Reading 1, Exercise 1	
3	28-Jan	Web Mapping Basics	3: Fu&Sun 2, Article, Notes	Exercise 3	Exercise 2	
4	4-Feb					
5	11-Feb	Geospatial Web Services	4: Fu&Sun 3, Article, Notes	Exercise 4	Reading 3	Individual Meetings
6	19-Feb**				Exercise 3	
7	25-Feb	Geospatial Mashups	5: Fu&Sun 4, Article, Notes	Exercise 5	Reading 4	
8	4-Mar				Exercise 4	
9	11-Mar	Geoportals and NSDI	6: Fu&Sun 6,7, Article, Notes		Reading 5	Proposal
Spring Recess	18-Mar	*March 18-23 - Spring Recess*				
10	25-Mar	Web GIS Applications	7: Fu&Sun 8,9, Article, Notes	Exercise 6	Exercise 5	
11	1-Apr				Reading 6	
12	8-Apr				Exercise 6	
13	15-Apr	The future of Web GIS	8: Fu&Sun 10, Article, Notes			Tech & Data Report
14	22-Apr				Reading 8	
15	29-Apr					Presentations
***	6-May					
****	13-May					Final Report
End of Semester	15-May	End of Semester				

*Monday January 21 is Martin Luther King Day, USC Holiday
**Monday February 18 is President's Day, USC Holiday
***May 4-7 listed as "Study Days" on USC calendar
 ****May 8-15 – listed as "Final Exams" on USC calendar

In addition to the usual Monday due dates for Reading Assignments as indicated in this table, Hands-On Assignments will generally be due on Thursdays, and also the following special due dates have been set:

- Individual meetings during Week 5 - slots will be individually scheduled during the week of February 11.
- Presentation of final project Week 15 – slots will be individually scheduled during the week of April 13.
- Final project Web GIS application and written report – due Fri. May 13, 5pm Pacific Time.