

## **SSCI 592, Mobile GIS**

**Units: 4**

**Term—Day—Time:** Spring, 2015 (online)

**Location:** Online

**Instructor:** Yao-Yi Chiang, Ph.D.

**Office:** AHF B55C

**Office Hours:** By appointment. Please contact me to arrange when, how, and where to meet.

**Contact Info:** yaoyic@usc.edu, 213-740-7618 (office), yaoyichiang (Skype).

**IT Help:** Richard Tsung

**Hours of Service:** Mondays to Fridays, 9:00 a.m.-5:00 p.m.

**Contact Info:** ctsung@usc.edu, 213-821-4415 (office)

## Course Description

This course is designed to immerse you in the fundamental programming concepts and cutting-edge technologies that support mobile GIS development. There is no textbook for this class since we will be using the most recent online programming resources, including public discussion forums, SDK (software development kit) tutorials, and cloud-based services (e.g., Parse.com and CartoDB.com). In addition, you must be comfortable using the web to research for concepts and terms that come up in the course when you do not understand them. Due to the rapidly changing nature of programming techniques, libraries, and SDKs, online searches and existing discussion boards around the web are where to find the latest up-to-date information pertaining to programming mobile devices and GIS. These technologies are all very new and are quickly changing so we will all be learning together throughout the semester. Be sure to share with everyone and post to the message board whenever you find something new and interesting.

## Learning Objectives

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

- Evaluate the advantages, disadvantages, and major challenges of creating and working with mobile GIS applications.
- Describe how mobile GIS and spatial concepts create powerful communication tools.
- Understand the key similarities and differences between various mobile GIS technologies, including software applications and hardware devices.
- Critically assess contemporary mobile GIS technologies.
- Design, program and implement a mobile GIS application.

**Prerequisite(s):** SSCI 586 GIS Programming and Customization and SSCI 591-Web GIS

**Co-Requisite (s):** None

**Concurrent Enrollment:** None

**Recommended Preparation:** This course will be time intensive and involve lots of programming tasks. You need to be familiar with object-oriented programming and concepts such as variables, loops, and logic. Depending on your programming skills, this course may take more time than other courses in the program, so if you are not able to dedicate the time this semester, you should consider taking a different elective or taking this course at a different time. SSCI 586-GIS Programming and Customization and SSCI 591-Web GIS provide you with an excellent introduction to programming. These are great courses to learn contemporary programming concepts and languages such as JavaScript and Python. Therefore, this course will be much more beneficial to those who have completed these classes and are quite familiar with programming.

## **Course Notes**

The course will be taught as an online class. Class meetings will be used to discuss the assigned readings and any questions and related topics that arise from the readings. The learning and teaching strategies are student-centered. They aim to encourage a deep-learning approach by using reflection and self-evaluation. The individual class sessions will be organized around class readings that are designed to provide the essential background and framework for study. Students will be required to reflect on their learning through in-class discussions and a series of carefully crafted assignments.

## **Technological Proficiency and Hardware/Software Required**

Every student is required to purchase a Google Nexus 7 Android tablet for the class. All course assignments including the final project will be completed using this specific device. Every student must have a computer with a fast Internet connection and a functional webcam for use whenever a presentation or meeting is scheduled.

## **Required Readings and Supplementary Materials**

The weekly readings will be accessed via the USC Library's electronic collections and/or provided by the instructor via Blackboard.

## **Description and Assessment of Assignments**

Your grade in this class will be determined on the basis of several different assessment tools. Each week, I will post a Weekly Assignment outlining the work you are expected to complete that week with the relevant due dates.

Resume Assignment (2%) – One assignment for a total of 2 points: We require all current students to post and maintain a public resume, short biography, and recent photo on our shared GIST Student Community Blackboard site. Unless you opt out, your photo and resume will be posted to the Spatial Sciences Institute website and your resume will be included in the GIST Resume Book. The latter is compiled annually and along with our web presence used to promote our programs and more importantly, your skills, experience, and professional aspirations.

Major Assignments (60%) – Five assignments for a total of 60 points: You will read and work through a series of tutorials in programming languages and various APIs associated with mobile devices during the first 10 weeks of the semester. 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 and the various contributions will be submitted in five assignments at approximately two-week intervals.

Final Project (38%) – One final project including four components for a total of 38 points: The Final Project is your opportunity to integrate all that you have learned in the semester and will require you to:

1. Design a mobile GIS application for a specific purpose and audience of your choice.

2. Select and implement your chosen mobile GIS application in your production environment.
3. Implement user capabilities based on your application's purposes and goals.
4. Produce a final report and accompanying video product that demonstrates the results of your final project work.

The grades for the final project will be spread across four components as follows: (1) the proposal describing the proposed project, including software to be implemented and any data to be acquired (8 points); (2) weekly project updates posted to the discussion board (8 points); (3) a final report documenting the plan and purpose of the project, the mobile GIS application, the development and implementation of the application, issues encountered while completing the project, and future possibilities (12 points); and (4) a recorded demo presentation video of your final project with voiceover demonstrating your mobile GIS application and its capabilities (10 points).

Careful planning and a serious, consistent commitment will be required for you to successfully navigate the various deliverables in this and other GIST courses. The table below summarizes the SSCI 592 course assignments and their point distribution:

## Grading Breakdown

Assignments	Number	Points Per Assignment	% of Grade
Resume assignment	1	2	2
Major assignments	5	12	60
Final Projects:			
Proposal	1	8	8
Weekly updates	4	2	8
Final Report	1	12	12
Video	1	10	10
<b>Totals</b>	<b>13</b>	<b>-</b>	<b>100</b>

### Assignment Submission Policy

Assignments will be submitted for grading via Blackboard using the due dates specified in the Course Schedule below.

### Additional Policies

Students are expected to complete and upload all assignments before the deadlines detailed in the Course Schedule. Late work will be assessed a penalty of 1 point per day and zero grades will be assigned for work that is more than one week late.

This is an online 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. Blackboard discussion forums will be created and monitored at the start of the 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. In addition, I will send via emails 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. Check now to make sure that mail sent from both the USC Blackboard accounts and my email does not go into your junk mail.

While I am usually online and will probably respond to emails from students relatively quickly, I will endeavor to respond to all email within 24 hours of receipt, aiming for no more than 48 hours delay. In the rare case when I expect to be offline for more than 72 hours, I will post an announcement on the Blackboard site. That said, 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.

### Important Administrative Dates

- 1/12: Spring semester classes begin
- 1/19: Martin Luther King Day (University holiday)
- 1/30: Last day to register and add classes

1/30: Last day to drop a class without a mark of "W" and receive a 100% refund

2/16: Presidents' Day (University holiday)

3/16-21: Spring recess

4/10: Last day to drop a class with a mark of W

5/1: Spring semester classes end

5/2-5: Study days

5/13: Final Examinations end

5/15: Commencement

### Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Readings and Homework	Deliverables/Due Dates
<b>Week 1</b> 1/12	<b>Introduction to Android Technology, Mobile GIS Data</b> Introductions to the course materials and the basics of mobile GIS development, including a discussion of class goals, projects, technologies, reading assignments.	<ul style="list-style-type: none"> <li>Class Notes</li> <li>Fu, P., &amp; Sun, J. (2010). <i>Web GIS: Principles and Applications</i>. Redlands, CA, Esri Press (Chapter 5).</li> </ul>	No deliverables.
<b>Week 2</b> 1/20			Submit assignment 1 & resume on Blackboard no later than 5:00 p.m. Pacific Time on Tuesday, 1/20.
<b>Week 3</b> 1/26	<b>Object-Oriented Design, Programming and Mobile Fundamentals</b> Learning object-oriented design and Java for building mobile GIS applications.	<ul style="list-style-type: none"> <li>Class Notes</li> </ul>	Schedule an individual meeting with the instructor before 5:00 p.m. Pacific Time on Monday, 2/2.
<b>Week 4</b> 2/2			Submit assignment 2 on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 2/4.
<b>Week 5</b> 2/10	<b>Java and Android</b> Learning how to use Java specifically in the Android environment, including hands-on exercises to introduce the Android SDK along with the ADT plug-in for Eclipse.	<ul style="list-style-type: none"> <li>Class Notes</li> </ul>	No deliverables.
<b>Week 6</b> 2/17			Submit assignment 3 on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 2/18.
<b>Week 7</b> 2/23	<b>Esri ArcGIS Online and Mobile GIS</b> Introducing contemporary SDK for developing mobile GIS applications, including Esri ArcGIS Runtime SDK.	<ul style="list-style-type: none"> <li>Class Notes</li> </ul>	No deliverables.
<b>Week 8</b> 3/2			Submit assignment 4 on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 3/4.
<b>Week 9</b> 3/9	<b>Evolution of Mobile GIS</b> A discussion of mobile GIS past, present, and future from the viewpoints of both academia research and industry.	<ul style="list-style-type: none"> <li>Class Notes</li> </ul>	Submit project proposal on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 3/11.
<b>Week 10</b> 3/23			Submit assignment 5 on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 3/25.

<b>Week 11</b> 3/30	<b>Contemporary Mobile GIS</b> A discussion of contemporary mobile GIS software, hardware, and cloud platform.	• Class Notes	Submit first project update on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 4/1.
<b>Week 12</b> 4/6			Submit second project update on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 4/8.
<b>Week 13</b> 4/13	<b>Future Mobile GIS</b> A discussion of the current challenges and future directions of mobile GIS.	• Class Notes	Submit third project update on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 4/15.
<b>Week 14</b> 4/20			Submit fourth project update on Blackboard no later than 5:00 p.m. Pacific Time on Wednesday, 4/22.
<b>Week 15</b> 4/27	<b>Final Presentations</b> Students will present their projects, summarizing the insights garnered from each phase of the modeling process as experienced in their specific problem context.	• Class Notes	Students present their projects and answer questions from audience. Allow 10 minutes per student assuming a maximum of 15 students per class.
<b>FINAL</b> 5/4			Final reports to be submitted on Blackboard no later than 5:00 p.m. on Friday, 5/5.

## Statement on Academic Conduct and Support Systems

### Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

### Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute*

<http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* [http://sait.usc.edu/academicsupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.