

USC Dornsife

Dana and David Dornsife
College of Letters, Arts and Sciences
Spatial Sciences Institute

SSCI 592, Mobile GIS

Syllabus

Units: 4

Term — Day — Time: Summer 2018, Online

Location: Online

Instructor: Yao-Yi Chiang, PhD, GISP

Office: AHF B55C

Regular Office Hours: Tuesday 4 to 5 p.m. and Thursday 11 a.m. to 12 p.m. PST. Also available most days and times by appointment via email.

Contact Info: yaoyic@usc.edu,
<https://bluejeans.com/5067546751> (BlueJeans), 213-740-7618 (office), yaoyichiang (Skype).

Library Help: Andy Rutkowski

Office: VKC 36B

Office Hours: Tuesday 10 a.m. to 12 p.m. and Thursday 4:30 to 5:30 p.m. PST

Contact Info: arutkows@usc.edu, 213-740-6390,
<http://bit.ly/andyhangout>

IT Help: Richard Tsung

Office: AHF 145D

Office Hours: By appointment

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

Course Scope and Purpose

This course is designed to immerse you in the fundamental programming concepts and cutting-edge technologies that support mobile GIS development. This course is an elective course for the GIST M.S. as well as the GIST, Geospatial Intelligence, and the Geospatial Leadership Certificate Programs. 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., Carto.com). In addition, you must be comfortable using the web to clarify 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 Outcomes

On completion of this course, students should 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): None

Co-Requisite(s): None

Concurrent Enrollment: None

Recommended Preparation: You do NOT need prior programming experience to take this course. The first two learning modules in this course will guide you to learn object-oriented programming and concepts such as variables, loops, and logic. The remaining course modules will enable you to build an Android mobile application.

Course Structure

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 first class meeting will be held during Weeks 3 & 4 (see the weekly schedule table for additional details). We will meet online using BlueJeans. Later in the class, we will discuss and set further meetings if and as needed. 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 Blackboard discussions and a series of carefully crafted assignments.

Workload – This is a four credit, one semester course. Students should expect to spend 10-15 hours per week completing the work in this course.

Technological and Communication Requirements

Every student is required to purchase an Android device for the class. It is important to double check that your Android device has the latest operating system, a GPS sensor, Wi-Fi support, and computational power that matches at least the specification of the Google Nexus 7 tablet. Please note that the 2013 version of Google Nexus 7 tablet does not support the latest Android operating system (Android Nougat), which is fine for the class, but you might want to consider a newer Nexus device to use the new features in Android Nougat. All course assignments including the final project will be completed using this Android device. Note that, although there are literally thousands of various types of Android devices, we will not provide additional tech support for non-Nexus devices.

In addition to an Android device, every student must have the following technology requirements:

- A computer with a fast Internet connection.
- A functional webcam and a microphone for use whenever a presentation or meeting is scheduled.
- An up-to-date web browser to access the SSI Server.

SSI Server and Tech Support – This course utilizes the SSI GIST Server which is a virtual desktop giving access to many different professional software. If you are unable to connect to the server or experience any type of technical issues, send an email using your USC account to GIST Tech Support at spatial_support@usc.edu, making sure to copy (cc) me on the email.

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 Blackboard. 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.

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. Do not ignore course email until the day before assignments are due. Also double check to be sure that email sent from the USC blackboard account does not go into your junk mail!

While I am usually online all day 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 72 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.

Discussion forums – On the Blackboard site, I will post a series of discussion threads relevant to various sections of the course. Discussions provide a key means for student-to-student discussion and collaboration that can replicate the face-to-face contact you may have experienced in traditional classrooms. Here students can provide support to each other while working on their assignments, sharing hints and helpful tips, as you would in a classroom laboratory. Please post your questions about assignments there, as you would ask them publically in the classroom. I monitor the discussion threads and offer comments when necessary, but more importantly, consider the discussion board a key way to connect with your classmates and share your discoveries.

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

Weekly Assignments

Your grade in this class will be determined on the basis of several different assessment tools.

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 Spatial Sciences Institute 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 Spatial Sciences Institute 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 (50%) – Five assignments for a total of 50 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. The various contributions will be submitted in five assignments at approximately two-week intervals.

Quizzes (10%) – Two quizzes for a total of 10 points: You will work through a series of class materials and hand-on tutorials in mobile programming concepts during the first six weeks of the semester. You will take two quizzes on Blackboard to test your understanding of object oriented programming and Android.

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 goals and deliverables.
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).

Grading Breakdown

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

Assessment	Number	Points Each	Total Points
Weekly Assignments			
Resume assignment	1	2	2
Major assignments	5	10	50
Quizzes	2	5	10
Project Components			
Proposal	1	8	8
Weekly updates	4	2	8
Final Report	1	12	12
Final Presentation/Video	1	10	10
Totals			
	15	-	100

Assignment Submission Policy

Unless otherwise noted, all assignments and quizzes are *due by 11:59 p.m. PST on Mondays*. In most cases, assignments must be submitted via Blackboard. Project components have different due dates as indicated on the Course Schedule below. Your attention to on-time assignment submission is essential.

Strict penalties apply for late assignments as follows:

- All assignments will be penalized 2 points up to SEVEN days late. No points will be given for submissions more than SEVEN days late. Note that all assignments worth 2 points will receive 0 points if submitted late.
- Additionally, no written work will be accepted for grading after *11:59 p.m. PST* on the last day of classes.

Weekly Schedule

	Topic	Readings and Assignments	Deliverables/Due Dates
Week 1 5/16	Introduction to Java and Android Technology	Class notes on programming fundamentals	No deliverables
Week 2 5/21	Introductions to the course materials and the basics of mobile GIS development, including a discussion of class goals, projects, technologies, reading assignments		1) Submit resume on the Blackboard no later than 11:59 p.m. PT on Monday, 5/21 1) Submit assignment 1 and 2) “Object-oriented Programming and Java” quiz on the Blackboard no later than 11:59 p.m. PT on Monday, 6/4
Week 3 5/29* *Monday, 5/28 is a university holiday	Object-Oriented Design, Programming and Mobile Fundamentals (Esri AppStudio) Learning object-oriented design and Java for building mobile GIS applications	Class notes on Java, object-oriented design, Keyhole Markup Language, and Esri AppStudio	Schedule an individual meeting with the instructor no later than 11:59 p.m. PT on Monday, 6/4
Week 4 6/4			Submit the full assignment 2 on Blackboard no later than 11:59 p.m. PT on Monday, 6/11
Week 5 6/11	Java and Android Learning how to use Java specifically in the Android environment, including hands-on exercises to introduce the Android SDK along with Android Studio	Class notes on Android development, Eclipse, and Android code samples	1) Announce your sample ownership for assignment 3 and 2) finish the “Android” quiz on the Blackboard no later than 11:59 p.m. PT on Monday, 6/18
Week 6 6/18			Submit your sample for assignment 3 on Blackboard no later than 11:59 p.m. PT on Monday, 6/25
Week 7			1) Announce your sample ownership for assignment 4, 2)

6/25	Esri ArcGIS Online and Mobile GIS Introducing contemporary SDK for developing mobile GIS applications, including Esri ArcGIS Runtime SDK.	Class notes on Esri ArcGIS Runtime SDK for Android Final project descriptions.	submit project proposal , and 3) submit the full assignment 3 on Blackboard no later than 11:59 p.m. PT on Monday, 7/2
Week 8 7/2* *Wednesday, 7/4 is university holiday			Submit your sample for assignment 4 on Blackboard no later than 11:59 p.m. PT on Monday, 7/9
Week 9 7/9	Evolution of Mobile GIS A discussion of mobile GIS past, present, and future from the viewpoints of academia research	One self-selected GIS journal article and the class discussion board	1) Submit assignment 5 (part 1) , 2) full assignment 4 , and 3) first project update on Blackboard no later than 11:59 p.m. PT on Monday, 7/16
Week 10 7/16	Evolution of Mobile GIS (Cont'd) A discussion of mobile GIS past, present, and future in the industry	One news article covering mobile GIS development and the class discussion board	Submit the second project update on Blackboard no later than 11:59 p.m. PT on Monday, 7/23
Week 11 7/23	Contemporary Mobile GIS A discussion of contemporary mobile GIS software, hardware, and cloud platform	Class notes on Carto and Parse.com	Submit the third project update on Blackboard no later than 11:59 p.m. PT on Monday, 7/30
Week 12 7/30			Submit 1) fourth project update , 2) assignment 5 (part 2) , and 3) presentation slides on Blackboard no later than 11:59 p.m. PT on Monday, 8/6
Week 13 8/6	Final Presentations Students will present their projects, summarizing the insights garnered from each phase of the project developing process.	Project updates from fellow classmate and the class discussion board Project wrap-up notes from fellow students Presentation slides from fellow students	Students present their projects and answer questions from audience. Allow 10 minutes per student assuming a maximum of 15 students per class Final reports and presentation slides to be submitted on Blackboard no later than 11:59 p.m. on Tuesday, 8/7

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 Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. 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>.

Support Systems

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/sssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu

Resources for Online Students

The Course Blackboard page and the GIST Community Blackboard page have many resources available for distance students enrolled in our graduate programs. In addition, all registered students can access electronic library resources through the link <https://libraries.usc.edu/>. Also, the USC Libraries have many important resources available for distance students through the link: <https://libraries.usc.edu/faculty-students/distance-learners>. This includes instructional videos, remote access to university resources, and other key contact information for distance students.