App Development for Phones and Tablets

ITP-341x (3 units)

USC Viterbi School of Engineering

Description

Develop phone and tablet applications for open-source platforms such as Android that utilize the core functionality of mobile devices such as GPS, accelerometers, touch gestures.

Objective

This course teaches how to develop applications for smartphones and tablets supporting open-source operating systems such as Android. We will go through the process of building a mobile application from start to finish using the Android SDK (Software Development Kit). You will learn how to leverage your Java programming knowledge to design mobile interfaces, how to use the libraries to build applications that have the proper look and feel, how to use table views, how to design and handle user input, and other aspects as time permits. During the lab sessions, students will create applications using the Eclipse IDE (Integrated Development Environment).

Concepts

Mobile development, tablet development, user interface design, object-oriented programming

Prerequisites

ITP 365x or ITP 367x or CSCI 104L

Instructor	Rob Parke
Contacting the Instructor	parke@usc.edu
Office Hours	listed on Blackboard
Lab Assistants	TBD
Contacting the Lab Assistants	TBD
Lecture	4 hours / week

Required Textbooks

TBD

Optional Textbooks

Clifton, Ian G. *Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps.* Addison-Wesley Professional, 2013.
ISBN: 0321886739

Phillips, Bill, and Brian Hardy. *Android Programming: The Big Nerd Ranch Guide* Big Nerd Ranch Guides, 2013.
ISBN: 0321804333

Website

All course material will be on Blackboard (http://blackboard.usc.edu).

Grading

Assignments	50%
Midterm	20%
Final Project	30%

Grading Scale

A	100-93	B-	82-80	D+	69-67
A-	92-90	C+	79-77	D	66-65
B+	89-87	C	76-73	F	64 or below
B	86-83	C-	72-70		

Final Project Details

Near the end of the semester, students will individually work on building and deploying a mobile app of their own design. Before beginning work on their project, students must have their proposal approved by the instructor. Working on a project which is not approved is not allowed.

Schedule

Week 12 – Submit project proposal
Week 13 – Revise proposal if necessary
Weeks 14 to 16 – Work on project
Final exam period – Final presentation (Graded)

Basic Requirements

The final project must be a mobile app (written in Java) that is successfully deployed on an Android device. Successful project will follow the Android style guidelines and UI standards, allow for user interaction, and demonstrate concepts learned during the course. A project must represent the student's sole effort; online tutorials or class examples may be consulted,

but they must be improved upon and noted in the final documentation. Failure to note and provided links to any reference material will be considered cheating.

Proposal
Students will be required to submit a proposal prior to beginning work on the project. The necessary components of the proposal will be covered in class.

Documentation
Students will be required to submit documentation along with their project.

Grading
The final project is 30% of the overall semester grade, and the breakdown is as such:

Proposal	10%
Project requirements met	60%
Documentation	20%
Presentation	10%

Policies

Students are expected to:

- Attend and participate in lecture discussions and critiques
- Attend and complete weekly labs
- Manage and complete individual class projects

Students are responsible for completing assignments and projects by stated deadlines. Most assignments will be uploaded to the course's Blackboard site.

Late Work

Assignments and projects will be accepted for full 50% credit for up to one week after the due date; after one week, late work will **not** be accepted. It is the responsibility of the student to contact the grader when posting late projects.

ITP Labs

Before logging onto an ITP computer, students must ensure that they have emailed or saved projects created during the class or lab session. Any work not saved will be erased after restarting the computer. ITP is not responsible for any work lost.

ITP offers Open Lab use for all students enrolled in ITP classes. These open labs are held beginning the second week of classes through the last week of classes. Please contact your instructor for specific times and days for the current semester.

Incomplete and Missing Grades

Excerpts for this section have been taken from the University Grading Handbook, located at

http://www.usc.edu/dept/ARR/grades/gradinghandbook/index.html. Please see the link for more details on this and any other grading concerns.

A grade of Missing Grade (MG) "should only be assigned in unique or unusual situations… for those cases in which a student does not complete work for the course before the semester ends. All missing grades must be resolved by the instructor through the Correction of Grade Process. One calendar year is allowed to resolve a MG. If an MG is not resolved [within] one year the grade is changed to [Unofficial Withdrawal] UW and will be calculated into the grade point average a zero grade points.

A grade of Incomplete (IN) "is assigned when work is no completed because of documented illness or other 'emergency' **occurring after the twelfth week** of the semester (or 12th week equivalency for any course scheduled for less than 15 weeks)."

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 are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. 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/.

A Note about Collaboration and Cheating

Assignments and projects in computer programming course are different from those in some other types of courses. Students may **NOT** collaborate, work together, share code, or in any way exchange solutions for assignments and projects. All assignments are analyzed by software that looks for similarity. Any sharing of ideas or code will be considered a violation of academic integrity (cheating) and an SJACS report will be filed.

Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to your course instructor (or TA) as early in the semester as possible. DSP is located in STU 301 and is open from 8:30am to 5:00pm, Monday through Friday. Website and contact information for DSP http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) ability@usc.edu

Emergency Preparedness/Course Continuity in a Crisis

In case of emergency, when travel to campus is difficult, if not impossible, USC executive leadership will announce a digital way for instructors to teach students in their residence halls or homes using a combination of the Blackboard LMS (Learning Management System), teleconferencing, and other technologies. Instructors should be prepared to assign students a "Plan B" project that can be completed 'at a distance.' For additional information about maintaining your classes in an emergency, please access:
http://cst.usc.edu/services/emergencyprep.html

App Development for Phones and Tablets

ITP-341x (3 units)

Course Outline

Subject to change throughout the semester

Week 1 – Introduction to Android

- Overview of mobile development
- Android platform and devices
- Configuring Eclipse and Android SDK
- Creating an app

Reading

Phillips ch. 1

Assignment/Project

Lab 1

Week 2 –Java Review

- Inheritance
- Interfaces
- Listeners
- Packages
- Inner classes

Reading

Java API (http://docs.oracle.com/javase/7/docs/api/)

Assignment/Project

Lab 2

Week 3 – Android and Model-View-Controller

- MVC paradigm
- Updating the view layer
- Updating the controller layer
- Managing icons
- Deploying to a device

Reading

Phillips ch. 2

Assignment

Lab 3

Week 4 – Activity Lifecycle

- Logging
- Persistent data
- Rotation
- Multiple activities
- Sharing data between activities

Reading

Phillips chs. 3, 5

Assignment

Lab 4

Week 5 – UI Fragments

- Android device differences
- FragmentManager
- Hosting and Creating UI Fragments

Reading

Phillips ch. 7

Assignment

Lab 5

Week 6 – Layouts and Widgets

- Creating user interfaces
- XML layout attributes
- Graphical layout tool

Reading

Phillips ch. 8

Assignment

Lab 6

Week 7 – Displaying Lists

- ListFragment
- ListView
- ArrayAdapter
- Customizing list items
- Activities and Fragments

Reading

Phillips chs. 10-11

Assignment

Study for midterm

Week 8 – Midterm

Week 9 – Dialogs

- DialogFragment

- Sharing data between two fragments

Reading

Phillips ch. 12

Assignment

Lab 7

Week 10 – Audio and Video

- MediaPlayer
- Layout fragments
- Audio playback
- Video playback
- Retaining fragments
- Rotation revisited

Reading

Phillips chs. 13-14

Assignment

Lab 8

Week 11 – Action Bar

- Options menus
- Multiple menu XML files
- Menu fragments
- Menu resources
- Ancestral navigation

Reading

Phillips ch. 16

Assignment

Lab 9

Week 12 – Saving and Loading Local Files

- Android filesystem and Java I/O
- Saving data
- Loading data
- Accessing external storage

Reading

Phillips ch. 17

Assignment

Lab 10

Project proposal

Week 13 – Context Menus

- Context-menu resources
- Floating context-menu

- Contextual action mode
- Approaches to device compatibility

Reading

Phillips ch. 18

Assignment

Project

Week 14 – Interacting with the Camera

- Using the camera API
- Taking a picture
- Handling / storing images

Reading

Phillips chs. 19-20

Assignment

Project

Week 15 – Intents and Tasks

- Spawning activities in other applications
- Implicit intents
- Explicit intents
- Tasks
- Back stack
- Creating a launcher

Reading

Phillips chs. 21, 23

Assignment

Project

Documentation

Project Presentation

- Students should prepare a 5-10 minute presentation / demonstration of their projects
- This will take place during the scheduled final exam period (see Schedule of Classes)