App Development for Phones and Tablets
ITP-341x (3 units)

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 Android Studio 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 under Contacts
Lab Assistants	Listed on Blackboard under Contacts
Contacting the Lab Assistants	Listed on Blackboard under Contacts
Lecture	4 hours / week

Required Textbooks

None. There will be extensive readings posted online weekly. These will typically be comprised of official Android documentation and book excerpts.

Optional Textbooks

Annuzzi, Jr., Joseph, et. al. Introduction to Android Application Development: Android Essentials (4th Edition). Addison-Wesley Professional, 2013. ISBN: 0321940261

Phillips, Bill, and Brian Hardy. *Android Programming: The Big Nerd Ranch Guide (2nd ed)* Big Nerd Ranch Guides, 2015. ISBN: 0134171454

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.

Policies

Students are expected to:
- Attend and participate in lecture discussions and critiques
- Attend and complete weekly Assignments
- 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 are accepted late with a penalty of 25% per day. This penalty applies immediately after the deadline. The final project will not be accepted late. It is the responsibility of the student to contact the grader when posting late projects.

Grading Issues

Students will have two weeks after graded feedback is given to contest scores (e.g. assignments, midterm, and project). After two weeks, scores will not be changed.

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 or 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)."

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 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 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.htmlprovides 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.

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.' Additional information about Campus Safety and Emergency Preparedness can be found at: http://preparedness.usc.edu.

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Course Outline
Subject to change throughout the semester

Week 1 – Introduction to Android
- Overview of mobile development
- Android platform and devices
- Configuring Android Studio
- Java OOP Review
- Activities

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

Assignment/Project
    Assignment 0
    Assignment 1

Week 2 – Android Core Components
- Listeners
- Interface Review
- Toasts
- Resources
- Debugging

Reading
    Posted online

Assignment/Project
    Assignment 2

Week 3 – Activity Lifecycle
- Activity Lifecycle
- Introduction to Persistent Data
- Logging
- Version Control / GitHub
- Debugging
- Rotation

Reading
    Posted online

Assignment
Assignment 3

Week 4 – Layouts and Widgets
- Creating user interfaces
- XML layout attributes
- Graphical layout tool
- Views and Layouts

Reading
Posted online

Assignment
Assignment 4

Week 5 – UI Listeners and Fragments
- UI listeners
- Fragments
- Sharing data across Fragments

Reading
Posted online

Assignment
Assignment 5

Week 6 – Intents
- Activity stack
- Navigation
- Intents
- Extras
- Sharing data across activities

Reading
Posted online

Assignment
Assignment 6
Study for midterm

Week 7 – Midterm

Week 8 – Model-View-Controller Paradigm
- Model-View-Controller
- "Plain old Java objects"
- SharedPreferences
- PreferenceActivity

Reading
- Posted online

Assignment
    Assignment 7

Week 9 –Lists
- Collections
- ListView
- ArrayAdapter
- Serializable
- Singletons

Reading
    Posted online

Assignment
    Assignment 8

Week 10 – Databases
- Creating and managing SQLite databases in Android
- Database helper classes
- Alternative Android databases

Reading
    Posted online

Assignment
    Assignment 9

Week 11 – Threading
- AsyncTasks
- WebViews
- Downloading files in Android

Reading
    Posted online

Assignment
    Assignment 10
    Project proposal

Week 12 – Networking, REST, and JSON
- JSON
- Data Persistence
- Android filesystem and Java I/O
- Saving data
- Loading data
- Accessing external storage

Reading
    Posted online

Assignment
  Assignment 11
  Project proposal revisions

Week 13 – Working with API
- Leveraging APIs
- Using cloud databases and storage

Reading
  Posted online

Assignment
  Project

Week 14 – Action Bar and Menus
- Action Bar
- Contextual Action Bar
- Custom adapters
- Menus

Reading
  Posted online

Assignment
  Project

Week 15 – TBD

Reading
  Posted online

Assignment
  Project

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)