INFSCI 1073
Application Development for Mobile Devices

(Cross listed with TELCOM 2727)

Spring 2016

Time: Tuesdays, Thursdays 1:00 PM – 2:15 PM

Location: Information Science Building, Room 404

Instructor: Dmitriy Babichenko

Office Hours:

- Wednesday, 3-4PM
- Thursdays, 3-4PM
- By appointment

Contact Information: dmb72@pitt.edu

Overview:

This course covers two broad categories of mobile application development - web apps that are developed specifically for viewing on and interacting with on mobile devices and native apps that are developed using languages and technologies specific to a particular mobile platform.

This is an active learning course where students complete a series of projects that will result in interactive apps developed using HTML5, CSS3 and jQuery, as well as apps developed specifically for Android mobile platform using Java programming language and Google Android SDK.

Key topics include web application development, web services, HTML5, jQuery, CSS3, PhoneGap, Android Development Studio, Android SDK, Android user interfaces, working with sensors, and developing mobile VR applications.

Prerequisites

1. C or better in INFSCI 0017 or CS 0401 or INFSCI 0015 (at Pitt Greensburg).
2. Working knowledge of relational databases such as MySQL, HTML5, CSS, and JavaScript. It is recommended that you have successfully completed INFSCI 1022 (Databases), INFSCI 1052 (User-centered design) before taking this course.

Objectives:

1. Understand web application infrastructure
2. Understand how to design and consume web services
3. Learn how to develop web application specifically for mobile devices using HTML5, CSS3, and jQuery
4. Learn how to deploy web applications to native code for different mobile platforms using PhoneGap
5. Learn how to design, implement, and deploy mobile applications for Android platform using Java and Android SDK
6. Understand basic concepts behind the emerging virtual reality (VR) technologies by working with Google Cardboard.

Course Schedule (tentative, subject to change):

Week	Date	Topic(s)
2	1/12	● Introduction ● Course overview ● XAMPP and localhost development overview ● Student server overview
2	1/14	● HTML/HTML5 overview ● CSS/CSS3 overview
3	1/19	● Introduction to web applications ● Introduction to JavaScript ● Debugging with Chrome developer tools
3	1/21	● Designing user interfaces for mobile devices ● Responsive design ● Bootstrap
4	1/26	● Introduction to web services o RESTful o SOAP ● Data exchange formats o JSON o XML ● Working with 3rd-party API
4	1/28	● Document Object Model (DOM) ● Introduction to jQuery ● Consuming and displaying data using jQuery
5	2/2	● Git and GitHub overview ● Deploying applications with PhoneGap
5	2/4	● HTML5 geolocation API ● HTML5 local storage API
6	2/9	● Introduction to Android application development

		● Android development studio ● Configuring Android Virtual Machines
6	2/11	• Android application project structure • Android activity lifecycle
7	2/16	● Designing GUI for Android applications ● Android layouts ● Android views
7	2/18	● Menus ● Action bars
8	2/23	• Navigation • Multiple Screens
8	2/25	● Event handling
9	3/1	• Relational databases refresher course
9	3/3	• Local storage on mobile devices • Working with SQLite
10	**3/8**	**No class - Spring break**
10	**3/10**	**No class - Spring break**
11	3/15	• Consuming external data o XML o JSON o RSS feeds
11	3/17	• Android graphics • Making things move in an Android app
12	3/22	• **No class - conference**
12	3/24	• Working with maps and geolocation (GPS)
13	3/29	• Developing mobile games, Part i
13	3/31	• Developing mobile games, Part II
14	4/5	● Working with Android sensors ○ Camera ○ Accelerometer
14	4/7	● Using sensors as input devices
15	4/12	● Introduction to VR ● Introduction to Google Cardboard
15	4/14	● Developing VR applications for Android
16	4/19	● **Final project presentations**
16	4/21	● **Final project presentations** ● **Final project code submission due**

Assignments:

- All assignments except for the final project will be individual. However, you are allowed to collaborate with other students (see **Collaboration vs. Cheating** below).
- All web-based mobile applications must be submitted via the student development server (more details on this later).
- All Android projects must be submitted via GitHub (https://github.com/). You will have to create a GitHub account, create a Git repository and submit a link to your repository via CourseWeb.

Grade Breakdown by Assignment:

- Assignments:
  - Mobile-friendly website: 10%
  - PhoneGap data-driven app: 15%
  - Database-driven Android address book: 20%
  - Social network extension Android app: 20%
- Final project - mobile game: 30%
  - **Note**: Because this course is cross-listed with TELCOM 2727, the final project for students registered for TELCOM 2727 will be different from the one for undergraduate students registered for INFSCI 1073.
- Final presentation and demo: 5%

Late Submissions:

Projects/assignments submitted after due date will be accepted, but your overall grade for that project/assignment will be reduced by 10% of the grade for every business day after the submission deadline. For example, if you will submit your work one week late, you will lose 50% of the grade.

Collaboration vs. Cheating

Collaboration on homework is permitted to an extent. Specifically, students are allowed to discuss the possible solutions to a problem and help each other with logic errors. However, handing your work to someone so that they may see a copy of your solution, or dictating code to a person on line-by-line basis is not within the spirit of the collaboration policy or the honor code of the university.

Project Grading:

If your submitted project does not compile and run, I will not grade it. You will have to fix all issues and resubmit your program. For each submission where your project does not work, you will lose 10 points.

Software and Tools Required in this Course:

- HTML Editor:
  You can use any HTML editor that you are comfortable with, but I would recommend one of the following:
  - For Microsoft Windows - Notepad ++ : https://notepad-plus-plus.org/
  - For MacOS - Brackets: http://brackets.io/
- FIleZilla FTP Client: https://filezilla-project.org/download.php
- XAMPP: https://www.apachefriends.org/download.html
- GitHub: https://github.com/
- PhoneGap: http://phonegap.com/
- Android Studio: http://developer.android.com/sdk/index.html
- VirtualBox: https://www.virtualbox.org/wiki/Downloads
- Genymotion (Android Virtual Machine manager): https://www.genymotion.com/#!/download

Grading Scale:

- 93 <= A < 100
- 90 <= A- < 93
- 88 <= B+ < 90
- 82 <= B < 88
- 80 <= B- < 82
- 78 <= C+ < 80
- 72 <= C < 78
- 70 <= C- < 72
- 60 <= D < 70
- F < 60

Academic Integrity:

Cheating/plagiarism will not be tolerated. All work must be your own, unless collaboration is specifically and explicitly permitted as in the course group project. Any unauthorized collaboration or copying will at minimum result in no credit for the affected assignment and may be subject to further action under the University Guidelines for Academic Integrity (http://www.provost.pitt.edu/info/ai1.html). You may incorporate excerpts from publications by other authors, but they must be clearly marked as quotations and properly attributed. You may discuss your ideas with others, but all substantive writing and ideas must be your own, or else be explicitly attributed to another, using a citation sufficiently detailed for someone else to easily locate your source.

Disability:

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact the Instructor and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890 / (412) 383-7355 (TTY), as early as possible in the term. Disability Resources and

Services reviews documentation related to a student's disability, provides verification of the disability, and recommends reasonable accommodations for specific courses.

Recommended Books:

- jQuery Mobile: Up and Running by Maximiliano Firtman. http://www.amazon.com/jQuery-Mobile-Running-Maximiliano-Firtman/dp/1449397654/
- PhoneGap Essentials by Ivan Turkovic. http://www.amazon.com/PhoneGap-Essentials-Ivan-Turkovic-ebook/dp/B014T58O54
- Android Programming: The Big Nerd Ranch Guide (2nd Edition) by Bill Phillips. http://www.amazon.com/Android-Programming-Nerd-Ranch-Guide/dp/0134171454/

Additional Resources:

- W3Schools HTML5 tutorial: http://www.w3schools.com/html5/default.asp
- W3Schools CSS3 tutorial: http://www.w3schools.com/css3/default.asp
- W3Schools JavaScript tutorial: http://www.w3schools.com/js/default.asp
- W3Schools AJAX tutorial: http://www.w3schools.com/ajax/
- W3Schools JSON tutorial: http://www.w3schools.com/json/default.asp
- W3Schools XML tutorial: http://www.w3schools.com/xml/
- PhoneGap: http://phonegap.com/
- jQuery: http://jquery.com/
- jQuery Mobile: http://jquerymobile.com/
- Android Developer: http://developer.android.com/