Florida Atlantic University's Engineering Scholars' Program
Department of Computer & Electrical Engineering and Computer Science (CEECS)

ENG 1935 – Mobile Applications for Google's Android
Summer 2012

1. Course Description and Prerequisites: The course will help students develop applications for Google's Android mobile phone. Students in groups of three will improve an existing application. The students will use a software emulator for the phone to develop the application and a real phone to demonstrate the application. The focus is on Computer Science aspects to develop, debug, and test a variation of an existing App. ***Prerequisites:*** Students 11th grade or higher (in fall '12) with a GPA of 3.0 or above.

2. Course Objectives (what we will do in the class): Android is the first and the only open source development environment for development of mobile applications. It has a number of powerful features, such as the web browser, Google Map, GPS, accelerometer, and bluetooth built in and available to be easily embedded in your application. That means that you will be able to take advantage of a wide variety of resources in building your application more rapidly and to be more sophisticated. We (and the Android user community) have built up many good design examples and tools that should help you imagine and implement many new applications. You will be exposed to many relevant tools and resources in the class so you can implement a reasonable variation of the chosen application in the class.

3. Course Outcomes (What we expect you to learn): You will feel confident enough after this course to take on development of many innovative applications. There is a rapidly growing market for Android mobile phones and applications. Good applications will achieve remarkable commercial success in a very short time. We hope many of you will achieve that success! You will be exposed to current ways of using Java for rapid App development.

4. Text Book: Deitel, P., Deitel, H., Deitle, A., and Morgano, M., Android for Programmers – An App-Driven Approach, Prentice Hall, Upper Saddle River, NY, 2012, ISBN: 10-0-13-212136-0. Reference book (this is a free PDF and code download); Becker, Java- Learning to Program with Robots, http://www.learningwithrobots.com/ On-line resources: d.android.com and android.fau.edu.

5. Resources (needed / to be provided): This is a rapidly evolving field. We have various Android development phones and a large collection of student designs completed by our engineering students. You will be using MotoDev, a software development environment provided free by Motorola that integrates Google's Android SDK (software development kit) and Eclipse IDE (integrated development environment), and provides their own enhancements. Google has worked hard to make this application development environment as friendly as possible to any novice developer. We have supplemented this with our own innovations with high school students in mind. More than 20 of our own student designs will be available for the high school students to draw inspiration from. Please bring your own laptop to install the development environment, so you can continue the development during the off hours. You will also have access to computers at 207 EE and 213 EE when there are no other classes running there. However, these are thin clients and emulation support is limited.

6. Grading Scheme: There will be 7 project assignments, 7 quizzes, and 2 exams, all geared to ensure that you are successful in your project and understanding of Android. Assignments are to be submitted on behalf of the team. Exams and Quizzes are individual and will be held in the class using blackboard. The project assignments will help you develop/improve an existing App. An updated and cumulative report is due after almost every

session, as detailed below.

The Project Assignments are worth 28%,
The Quizzes are worth 21%.
The Exams are worth 40%.
The final Demo and report are worth 11%
Individual team member's grades may differ dependent on input from other teammates.

Since this is an open source environment, we expect that you will adapt ideas from many sources. Up to 50% of your project intellectual value can come from other sources, which must be acknowledged. All submissions will be made via Blackboard. Any submissions sent directly to Dr. Shankar's email address are likely to be lost.

7. Course Schedule Details:

Monday, 6/11/12: Focus – Android Phone

Morning: Introduction to Android, Instructions for Android/ MotoDev Installation.
Afternoon: Explore exciting Google Applications
Quiz: Run Chapter 3/ Text applications and submit proof
To do: Sign Photo Release and IP forms.

Project Assignment: Discuss among yourselves and form groups of three students. Together the team will develop/improve a functional Android application, by the end of the three- week session. Report name of the team and team members. Report due.

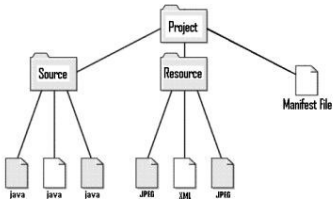
Wednesday, 6/13/12: Focus – Design and Implementation

Morning: XML (extensible markup language) for UI (User Interface) touch screen layouts. Explore chapter 4/Text examples.
Afternoon: UI (user interface) Design: Software tools for Assets: Visio and Photoshop. Explore Chapter 6/ Text
Quiz: Run FAU Apps. Do story-boarding for one of the FAU's Apps.
Project Assignment: Decide on the team and a project. Write a paragraph on system specifications. Provide story-boarding for your project. Report due.

Friday, 6/15/12: Focus – Design and Implementation

Morning: Java Programming Language – tutorials from android.fau.edu
Afternoon: Java (continued). Balsamiq for technical mockup
Quiz: Do Balsamiq for one of the FAU's Apps.
Project Assignment: Use Balsamiq for technical Mockup of your project. Report due

Monday, 6/18/12: Focus – System Design with Java

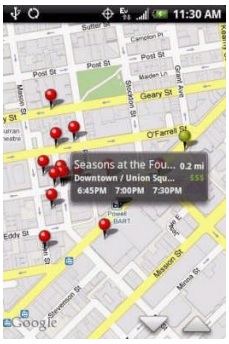


Morning: Top-Down system design. Chapters 2 and 3 /Becker's book.
Afternoon: Analyze the MVC model for App Development
Quiz: Do one of the examples from Chapters 2 and 3/ Becker
Project Assignment: Reverse Engineer an existing FAU App and list contents of various files and Java classes/methods in an abstract manner. Report due

Wednesday, 6/20/12: Focus – Wireless Communication and Animation

Morning: Wi-Fi, Twitter, and Bluetooth, Examples from FAU and Chapter 5/ Text.
Afternoon: Animation and Control. Chapter 7/ Text
Quiz: Analyze an FAU App
Project Assignment: Develop your project architecture, Report due

Friday, 6/22/12: Focus – Exam and GoogleMaps

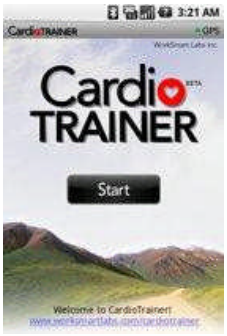


Morning: 2 hour mid-term exam.
Afternoon: Integration of web browser, Google Maps and Location Based Services. Explore Chapter 11/text
Quiz: Analyze an FAU App
Project Assignment: Start writing Java code and integrate XML for some of the activities, images, and any building blocks. Try unit testing. We will help you. Ask for help! Report is due

Monday, 6/25/12: Focus – Multimedia Building Blocks

Morning: Multimedia and Graphics Animation – with Java and open GL(Canvas, 2D sprites, and Animation). Explore Chapter 8 and 9 / Text Examples.
Afternoon : SQLite for database. Explore chapter 10/Text example.
Quiz: Modify an FAU App using multimedia embedding tools
Project Assignment: Continue with App development. No report is due.

Wednesday, 6/27/12: Focus - Sensor and Actuator Building Blocks; and Web Services



Morning: Use of Camera, Accelerometer, Vibrator, and Compass.
Afternoon: Web Services. Explore Chapter 14/ Text
Quiz: None
Project Goal: Integrate all the activities and try on the phone, with help from our student teaching assistants. Report is due.

Friday, 6/29/12: Focus – Final Exam and Project

Morning: Final Exam (2hours)
Afternoon: Team member Evaluation (on-line form). Demo Preparation. Upload Android Package and 7 page report in a Zip to the blackboard site. If too large, give us a location for download (such as YOUSENDIT.com). Final grade is dependent on having functional code and complete report.
Demo: 2 to 4 PM in the class room, 15 minutes/team

8. Submission and Lab Usage Requirements:

The students will submit their reports via blackboard at blackboard.fau.edu The classes will be held in 207 EE The Android development phones are available in the lab at 212 EE. You will have FAU Student ID card-based access to these labs. Please get your FAU student ID card issued. It will be very useful.

Note to parents of children under the age of 18: During the course of our program, we may take pictures of your child or your child's work, which could be used for publicity purposes. There will be an authorization form to be signed. By signing that form, you authorize Florida Atlantic University (FAU) and its official representatives to use, without obligation, photos or motion pictures of you, your child(ren), and/or their work for any and all publicity, publications, and advertising purposes that the FAU may designate

We provide here information on home PC/ Laptop requirements: MOTODEV Studio for Android™ has been tested for compatibility with the following systems. Although MOTODEV Studio may be compatible with other systems, Motorola offers support only for the systems described below.

Microsoft Windows

Microsoft Windows XP Professional Version 2002 with Service Pack 3
Java™ Runtime Environment (JRE) 6.0 Update 13
Intel® Core™ 2 Duo CPU, 2.33 GHz
2 GB RAM
Over 1.5 GB of free disk space (needed to install both MOTODEV Studio for Android and the Android SDK and plug-ins from Google; MOTODEV Studio itself only needs 150 MB)

Mac OS X

Mac OS X version 10.5.7
Java 2 Runtime Environment, Standard Edition 5.0 32-bit
Intel Core 2 Duo CPU, 2.4 GHz
4 GB RAM
Over 1.5 GB of free disk space (needed to install both MOTODEV Studio for Android and the Android SDK and plug-ins from Google; MOTODEV Studio itself only needs 150 MB)

Ubuntu Linux

Ubuntu Linux version 9.0.4
GNOME version 2.26.1
Java Runtime Environment (JRE) 6.0 Update 14 32-bit
Intel Core 2 Duo CPU, 2.4 GHz
2 GB RAM
Over 1.5 GB of free disk space (needed to install both MOTODEV Studio for Android and the Android SDK and plug-ins from Google; MOTODEV Studio itself only needs 150 MB)

9. Instructors and Contact Information:

Instructors:

Dr. Ravi Shankar and Mr. Joe Gundel, PhD Student, will be the main instructors. Mr. Gundel and two undergraduate students will help the students in all aspects of the design and development process.

Contact Information: Feel free to contact Dr. Shankar at shankar@fau.edu, (561) 297-3470, 513 EE Building, FAU, Boca Raton, FL.

10. Class Dates, Time and Location:

The classes will be held MWF 9.30 AM to 4.30 PM, with a break for lunch (from 12.30 PM to 1.30 PM), during 6/11/12 to 6/29/12, in room 207 EE (Engineering East building), building #96, on the FAU, Boca Raton, campus. Map: http://uavp.fau.edu/Flashmap/FAUMap.html. Students will have access to the Android phones in 212 EE during the non-class hours to develop their applications. A blackboard site (at blackboard.fau.edu) will provide all the related documents. Students will use the blackboard site to submit their assignments.

11. For Further Information:

android.fau.edu