MOBILE SOFTWARE DEVELOPMENT – 95-740
MONTH 2010

Course Syllabus and Outline

Instructor
Ramesha Murthy
Director, Sandora GPS Solutions,
0412 350 418
rmurthy@sandora.mobi

Teaching Assistant

Lecture
Any working day (except Tuesday), 6.00 – 9.00 pm
Classroom

Review Session

Pre-Requisites
95-705 Telecommunications Management
95-712 Object oriented programming in Java

Course Description

Mobile Phone industry is one of the fast growing businesses of current times and mobile phone subscribers have already surpassed the fixed phone line connections even in developing countries. Mobile media is dubbed as the seventh mass media. In countries such as Japan and South Korea, the internet usage is more on mobile devices than on computers. The use of twitter and email on mobile phone is growing at a fast pace too. The recent success of iPad sales is an indication of ever growing consumer hunger for this technology and wireless communication.

The technology requires development of software on mobile devices and need for the development of business solutions using the mobile devices. Leveraging this platform gives organization a big boost in productivity. Developing software for delivery of data and services to mobile devices offers challenges such as

1. mobile device is constrained by battery power.
2. user can be interacting with mobile device and can’t be disturbed till the user completes current tasks on the mobile.
3. mobile devices can be of multiple hardware platforms.

Keeping these in mind, Sun developed Java Mobile API for specific use in mobile application development. Today, most of the mobile phones support Java applications to run on them.

In this course, students will learn the skills for the development of mobile software using the Java knowledge they are already familiar with. They will get hands on experience in using IDE environment on desktop computers to develop simple applications and test them. They will also develop a business case for such a solution.
and development of future growth prospects which might lead to start-ups or collaboration with venture capitalists.

This course will provide students with an overview of the following critical technology, management, and policy topics.

- Technology infrastructure: Technologies that enable design, development and integration of Web 2.0 technologies as mobile device applications. Building on a basic understanding of internet and telecommunication technologies, an overview of technologies and technology trends will be provided. The objective is to equip you with the very latest thinking and provide you the required principles to formulate technology strategies in developing mobile applications for the business purpose.

- Organizational applications: Overview of information sharing on mobile phones and using the mobile phone as a productivity tool to ease one’s own work life.

- Policy Issues: Overview of the key legal and policy issues underlying mobile commerce. Issues such as privacy, security and online market presence will be discussed.

Learning Objectives

The course objectives are to enable students to:

- Understand the software environment on the mobile phone devices
- Unique characteristics of the mobile phone applications
- Design and develop the Java mobile application and android mobile application
- Develop a business case for a specific business solution

© 2010, Carnegie Mellon University Australia
To achieve these objectives we will use a combination of lectures, cases, class discussion, and exercises.

**Delivery Strategy**

Course delivery blends a number of different methodologies and combines face to face instruction with online support and assessment. Eclipse IDE with J2ME plug-in and Android plug-in, is used for code development and testing. Students are expected to use extensive online resources (available in the course documents and posted on Blackboard) and discuss issues in class and on Blackboard.

**Student Expectations**

A high level of individual student motivation and initiative will be expected. Students will be expected to use extensive online resources (in the course documents) on Android platform and Java Mobile platform. Team projects will require self-guided research. All the lecture notes and homework and project submissions will be posted on the Blackboard.

Students who successfully complete this unit will be able to:

1. understand how J2ME architecture works and how a J2ME application can be developed, installed and run on a mobile;
2. understand the capability of smart phones like iPhones, blackberry and android phones
3. develop a simple android or iphone application and test it either on an emulator or mobile phone.

**Books**

While there is no required text for this class, the following books cover many of the issues we discuss during the course. Other books may also be recommended.

- *Sun Wireless toolkit User Guide* – available online
- *Unlocking Android* – Frank Ableson, Charlie Collins and Robi Sen, Manning publisher.
- *Professional Android Application Development* – Reto Meier
- *iPhone Application Development* – Neal Goldstein

**Course Performance Evaluation**

Participant performance will be evaluated based on assignments, a team project, and class and Blackboard contribution, as follows:

- Assignment 1 25%
- Assignment 2 25%
- Assignment 3 25%
- Assignment 4 25%

Or

- Assignment 1 25%
- Assignment 2 25%
- Individual project/Team project 50%
The team project will be a group project. Each group will consist of less than 5 students. The project should be well researched and be original. Individual efforts in the project are recognized and rewarded accordingly.

**Re-grade Requests**

- Must be submitted within 1 week of the date the marked assignment was returned.
- Must be in writing and include copy of original.
- I re-grade entire assignment and as a result your grade can go up or down.
- Class and Blackboard Participation grades are not subject to re-grading.

**Grades**

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>97%~100%</td>
<td>A+</td>
</tr>
<tr>
<td>93%~96.99%</td>
<td>A</td>
</tr>
<tr>
<td>90%~92.99%</td>
<td>A-</td>
</tr>
<tr>
<td>87%~89.99%</td>
<td>B+</td>
</tr>
<tr>
<td>83%~86.99%</td>
<td>B</td>
</tr>
<tr>
<td>80%~82.99%</td>
<td>B-</td>
</tr>
<tr>
<td>77%~79.99%</td>
<td>C+</td>
</tr>
<tr>
<td>73%~76.99%</td>
<td>C</td>
</tr>
<tr>
<td>70%~72.99%</td>
<td>C-</td>
</tr>
<tr>
<td>Less than 70%</td>
<td>R</td>
</tr>
</tbody>
</table>

**Other Policies**

- Attendance at the lectures, and active participation, is important for successful completion of the course. I expect full class presence unless you have a good reason. Your class participation mark is also affected if you are late to classes. I expect you to be in the class on-time.

- No late home-works and group reports will be accepted. The deadline is 11:59 pm for all submissions, unless announced otherwise, and you will automatically lose 30% of the mark if you are late by up to one day. No credit will be given for a later submission.

**Ethical Standards**

Students at Carnegie Mellon are engaged in preparation for professional activity of the highest standards. Each profession constrains its members with both ethical responsibilities and disciplinary limits. To assure the validity of the learning experience Carnegie Mellon establishes clear standards for student work. You are required to be familiar with related university policies on this subject. An extract of these policies is reproduced here:

In any presentation, creative, artistic, or research, it is the ethical responsibility of each student to identify the conceptual sources of the work submitted. Failure to do so is dishonest and is the basis for a charge of cheating or plagiarism, which is subject to disciplinary action.

Cheating includes but is not necessarily limited to:

- Plagiarism, explained below.
- Submission of work that is not the student's own for papers, assignments or exams.
- Submission or use of falsified data.
- Theft of or unauthorized access to an exam.
- Use of an alternate, stand-in or proxy during an examination.
Use of unauthorized material including textbooks, notes or computer programs in the preparation of an assignment or during an examination.

Supplying or communicating in any way unauthorized information to another student for the preparation of an assignment or during an examination.

Collaboration in the preparation of an assignment. Unless specifically permitted or required by the instructor, collaboration will usually be viewed by the university as cheating. Each student, therefore, is responsible for understanding the policies of the department offering any course as they refer to the amount of help and collaboration permitted in preparation of assignments.

Submission of the same work for credit in two courses without obtaining the permission of the instructors beforehand.

Plagiarism includes, but is not limited to, failure to indicate the source with quotation marks or footnotes where appropriate if any of the following are reproduced in the work submitted by a student:

- A phrase, written or musical
- A graphic element
- A proof
- Specific language
- An idea derived from the work, published or unpublished, of another person.

As a matter of policy I will not tolerate cheating or plagiarism. If you are caught you will automatically lose all marks for that exam/assignment. I will decide whether further disciplinary action should also be taken.

**Course Schedule**

The following is an approximate plan for the topics covered in this course, and a time-line for course activities. Changes may occur because of unforeseen events.

**Day 1:**
- Course Outline
- Team project explanation
- Basics of business and the impact of technology
- Demo of some applications – Google map, twitter, email, sms
- Business case development

**Day 2:**
- Mobile software environment
- Mobile OS – symbian, android, MacOS
- J2ME framework
- Sun wireless SDK and its installation
- Developing simple midlet application

Handover Assignment 1 – Due in 2 weeks.

**Day 3:**
- Android architecture
- Android system resource management process
- Installing android plugin in Eclipse
- Various elements of android application – resources, manifest, permissions.
- Concept of Activity, Service, Broadcast receiver and Content Provider
- Importance of Intent class and Intent filtering

**Day 4:**
- Introduction to Activity class
- Use of VIEW class

Handover of Assignment 2 – Due in 2 weeks

**Day 5:**
- Introduction to Service, Broadcast Receiver and Content provider classes
- Understanding Networking API
- Understanding storage API

**Finalization of team project/individual project/assignment 3 & 4**

**Day 6:**
- Location Based API
- Packaging and marketing application
- Installing application on android phone

**Day 7:**
- Project presentation