CARNEGIE MELLON UNIVERSITY
H. JOHN HEINZ III COLLEGE OF PUBLIC POLICY AND MANAGEMENT

95-871K MOBILE APPLICATION DEVELOPMENT

Course Syllabus and Outline

Instructor
Prof. Murli Viswanathan
08-8110-9926
murlik@andrew.cmu.edu

Workshop/Lab
Monday 9:00-11:50am

Prerequisites
HTML5/CSS/Javascript and/or good programming experience

Suggested Materials

- Mobile JavaScript Application Development Bringing Web Programming to Mobile Devices By Adrian Kosmaczewski, O'Reilly Medi, June 2012
- Multi-Device Web Development with HTML5, CSS3, and JavaScript by Peter Gasston, April 2013, 264 pp. ISBN: 978-1-59327-487-0

Introduction

Smartphones are becoming ubiquitous. Applications running on these phones have become the mainstay for users. In fact studies show that more people access the web via mobile devices than from personal computers. As the number of devices expands dramatically, users are becoming accustomed to having both web and computing access via small, mobile devices and phones. This has resulted in a significant increase in demand for developers with experience using multiple platforms such as iOS, Android, and Windows Phone. At the same time, the growth in popularity of cloud computing has increased the ability for these devices to perform functions that previously required computation power unavailable on mobile devices. Mobile applications are considered one of the most important enterprise application decisions for businesses today. Marketing, IT and business managers are looking for expertise in leveraging mobile to grow sales and increase their customer base.

In this project-based course you discover how to use Apache Cordova, an open source mobile development framework, to create platform-neutral mobile applications. Apps can be created using standards based web technologies such as HTML, CSS and JavaScript which can then be deployed on iOS, Android, Blackberry, Windows Phone and other platforms. Adobe Cordova can speed up development and allow you to deploy your app more quickly.
This project-oriented course is partially modeled on the Information Systems project of the Heinz College. **The course will include a 12 week mobile application development project with public and private sector clients.** Students enrolled in the course will form groups of 4 to 5 and develop a mobile application (app) for an external client. Each group will be assigned a client and will work with this client over the semester. Students will be expected to undertake all activities of the application development life cycle including requirements analysis, design, coding, testing and deployment in collaboration with the clients. The course will also include a few guest lectures from industry experts on key application development topics.

Every week during the scheduled class time we will run workshops followed by a lab on topics relevant to mobile application development. These include Responsive Web Design, HTML5/CSS3/JAVASCRIPT, APACHE CORDOVA, Cross Platform Application Development and others.

**Course Objectives**

Specifically, at the end of this course, students should be able to:

1. Design, implement and deploy mobile applications using an appropriate software development environment. Understand the limitations and challenges of working in a mobile and wireless environment as well as the commercial and research opportunities presented by these technologies. Implement applications from scratch using best practice principles including object oriented design and test driven development.

2. Develop the skills required to create applications for the major mobile device players including Apple iPhone and Google Android. Understand the factors to consider when designing software for multiple platforms.

3. Understand the components and structure of a mobile development frameworks (Android SDK and Eclipse Android Development Tools (ADT)) and learn how and when to apply the different components to develop a working system for the client.

4. Learn about cross-platform mobile application development frameworks including, Titanium, Coronalabs and RhoMobile. Describe and apply the different types of application models/architectures used to develop mobile software applications

5. Understand the relationship between the mobile market and other emerging technologies including cloud computing and social networking platforms such as Facebook, Twitter, and LinkedIn

6. Acquire the necessary skills to ensure mobile applications efficiently utilize corporate data or data available from external web services.

7. Describe and work within the capabilities and limitations of a range of mobile computing devices. Gain insight into new trends and features in the mobile device marketplace.

Students are expected to be familiar with HTML, CSS and Javascript concepts. However the course will also provide essential training in Javascript programming for HTML5.
**Course Structure**

Students will be assessed on their performance in the mobile application development project based on client and peer evaluation:

- Real-world Group project (75%)
- Individual Project (25%)

**Group Project** – Students will form a group and work for an external client on the development of a mobile application. The deliverables for the project will include the developed application and a comprehensive report.

**Individual Project** – There will be an individual project where each student will be required to propose a mobile app and implement it using Apache Cordova. Javascript will be the primary programming language employed.

**Grades**

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<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>97%-100%</td>
<td>A+</td>
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<tr>
<td>93%-96.99%</td>
<td>A</td>
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<tr>
<td>90%-92.99%</td>
<td>A-</td>
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<tr>
<td>87%-89.99%</td>
<td>B+</td>
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<td>C</td>
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<tr>
<td>70%-72.99%</td>
<td>C-</td>
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**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:

- 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.
• 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.