**LAGUARDIA COMMUNITY COLLEGE**
**CITY UNIVERSITY OF NEW YORK**
**DEPARTMENT OF MATHEMATICS, ENGINEERING, AND COMPUTER SCIENCE**

**MAC220: Application Development for Android**

**3 credits (2 hours lecture, 2 hours lab)**
**Pre/corequisite: MAC190**

**COURSE DESCRIPTION**
This course will provide students with an understanding of the theory and skills needed to design and develop applications for Android devices using an Android development platform. Topics include Android development environment, application development fundamentals, user interface design including activity and intent class, view navigation, mapping/Geo positioning, camera applications, styles and database applications using SQLite.

**TEXTBOOK**:
Android Programming: The Big Nerd Ranch Guide (3rd Edition) (Big Nerd Ranch Guides) 3rd Edition by Bill Phillips, Chris Stewart, Kristin Marsicano

**INSTRUCTIONAL OBJECTIVES:**
1. Reinforce students' knowledge of Java programming.
2. Familiarize students with the Model-View Controller (MVC) Application Design.
3. Familiarize students with various User Interface (UI) tools such as layouts and input controls such as pickers, spinners, buttons, events, menus, action bar, notifications, styles and themes.
4. Enable students to create apps implementing dynamic UI, controlling app activity life-cycle, saving data to device, and managing interaction with other applications such as Address Book, Calendar and GPS.
5. Enable students to build apps with cloud computing, user info and location; using sensors and databases.
6. Enable students to build web base applications.

**PERFORMANCE OBJECTIVES:**
1. Develop Android Java programs to display and interact with user interfaces.
2. Create applications using MVC.
3. Develop applications that incorporate various UI-based tools.
4. Design and create applications employing different UI tools, and together with other applications in the device; apply appropriate user interface design techniques and standards to create intuitive, usable and efficient designs.
5. Develop more advanced applications that incorporate built-in sensors and databases.
6. Develop web-based applications for Android devices.

**GRADING POLICY**:      Laboratory work (6@5%)      30%
                         Project                     20%
                         Presentation                5%
                         Midterm Exam                20%
                         Final Exam                  25%.

**ACADEMIC INTEGRITY:**
This class will be conducted in compliance with LaGuardia Community College's academic integrity policy.

**ATTENDANCE:**
The maximum number of unexcused absences allowed is 15% of the total class meetings (about 7 hours). Unexcused absences beyond this maximum will result in a grade of WU or F.

**COMMENTS:**
The grading standards listed above and the suggested homework problems listed in the course outline are both subject to modification by the instructor.

**WEEKLY TOPICS:**

Week 1: Overview of Android development, fundamentals of Android application development, device compatibility, Android studio overview.
Lab 1: Setting up an Android studio and building a first android application.

Week 2: MVC model, application components, activity life-cycle.
Lab 1 Continued.

Week 3: Debugging an android application, building second activity and passing data between activities.
Lab 2: Debugging applications using logging and breakpoints and creating second activity.

Week 4: User interface I: fragments and Fragment Manager, discussion of project goals and objectives.
Lab 3: Creating basic user interface.

Week 5: User interface II: layouts and widgets.
Lab 4: Designing an application using different layout views.

Week 6: Applications with menus, action bar, various styles and themes.
Lab 5: Exploring different menus and styles, adding and moving items in an action bar.

Week 7: Picker views and spinners, DatePicker, PickerView components and spinners.
Midterm

Week 8: Media: adding video and pictures to applications.
Lab 6: Building applications using picker views and media.

Week 9: Camera and sensors, using camera to build applications, introduction to sensors (e.g., GPS) and building applications using them.
Lab 7: Using different sensors (GPS Maps) to build applications.

Week 10: Data storage I: overview of different data storage options, data back-up and applications of location installment, storyboarding, presentation of preliminary course project results.
Lab 8: Creating apps using data storage.

Week 11: Data storage II: working with internal and external storage, database applications, using SQLite, saving, retrieving and deleting data from a database.
Lab 9: Creating database applications.

Week 12: Designing web applications
Lab 10: Course project presentations.

Week 13: Final Exam