

DAWSON COLLEGE
Computer Science Technology Program
COURSE OUTLINE

Mobile Software Development

Number: 420-518-DW

Ponderation: 3-3-3

Credits: 3

Prerequisites: Successful completion of all Year 2 420.A0 courses

Co-requisites: 420-517-DW
420-524-DW
420-544-DW

Domain: Programming, Data Structures and Algorithms

Note: You must pass this course as well as the three co-requisite courses in order to progress to the sixth semester of the Computer Science Technology Program.

Semester: Fall 2017

Revision 2017-05-04

Description:

In this course, students will develop an application within the Android environment. Students will learn how to analyze, design, construct, and implement an effective Mobile application using the Android mobile development environment.

STATEMENTS OF COMPETENCE

- Use an object-oriented development approach. (016T)
- Produce algorithms. (016W)
- Develop user interfaces. (016X)
- Organize and use data. (0170)
- Assure the quality of an application. (0177)
- Design and develop an application in a graphics environment. (017C)

Teacher:
Patricia Campbell

Office:
3F.33

Local:
5042

Section: 01

Email: MIO

Teacher's schedule: <http://bit.ly/pmcofficehrs>

Course Objectives:

Upon successful completion of the course, the student will be able to:

1. Use the classes provided in the android framework within an object oriented app design (016T)
2. Analyse user requirements in order to develop an algorithm that is applicable to the problem situation (016W)
3. Evaluate user requirements in order to develop an appropriate mobile user interface (016X)
4. Develop a multilingual mobile user interface using android Views and Resources (016X)
5. Analyze a problem situation in order to determine the data requirements (0170)
6. Define the physical organization of data, implement an SQLite database on the android device (0170)
7. Use the android SQLite database class and cursors to access SQLite data sets (0170)
8. Use debugging mechanisms within an IDE in order to monitor variables and trace program execution (0177)
9. Design a test plan and create and use appropriate test data for application verification. (0177)
10. Incorporate multimedia components in the UI design. (017C)
11. Implement (design, write, test and package) an android app to a given specification (all competencies)

Course Methodology:

The course will consist of two 1½-hour lectures and one 3-hour lab session per week. Concepts and techniques will be presented in lectures. Practical exercises that apply the concepts and techniques will be given in the lab sessions.

Required:

Annuzzi, Darcey, Conder Introduction to Android Application Development: Android Essentials, 5/E ISBN-13: 978-0134389455

Supplemental:

Darcey, Conder Android Wireless Application Development: Volume II: Advanced Topics, 3/E ISBN-13: 978-0321813848

Deitel, Java How to Program, latest edition, Prentice Hall
(You should have this book from 420-317-DW)

Assessment of student performance:

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| Midterm Examination | 25% (Week 7 or 8) |
| Final Examination | 30% (During Exam period) |

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| Quizzes | 5% |
| Assignments | 15% |
| Project | 25% |

Course Objectives with their associated learning activities.

| Approx. Week | Topic Overview |
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| 1 | <p>Introduction to Android</p> <ul style="list-style-type: none">• History and Overview• Java API versus Android API• Limitations of embedded development• The Android Software Development Kit (SDK)• Android Development Tools (ADT)• Android Platforms and Android Virtual Devices (AVD)• Overview of the Architecture of Android OS |
| 2 | <p>Understanding The anatomy of an Android App</p> <ul style="list-style-type: none">• Building an App's UI• Initial Construction of the layout (the layout resource)• Initial use of strings (the strings resource)• Initial look at the AndroidManifest.xml• Initial look at widgets (Button, TextView, EditText) |
| 3 | <p>Android Activity</p> <ul style="list-style-type: none">• Activity Class Lifecycle• Lifecycle methods• Lifecycle states (Resumed, Paused, Stopped) <p>Maintaining State</p> <ul style="list-style-type: none">• Save an Activity state (InstanceState Bundle class)• Use SharedPreferences |
| 4 | <p>Android Resources System</p> <ul style="list-style-type: none">• Definition of resources• Types of resources: layout, values, drawable• Access resources programmatically• Access resources through Android XML• Internationalization (i18n) and Localization (l10n) |
| 5 | <p>Debugging Android</p> <ul style="list-style-type: none">• Android Emulator (AVD)• Use the Android Log class and the Toast class• Debugging with Eclipse Debug mode, Debug Perspective• Using the Android Debug Bridge (adb) |
| 6 | <p>Android Activity Intents</p> <ul style="list-style-type: none">• Types of intents: implicit, explicit• Intent with results Sender |

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| | Intent with results Receiver |
| 7 | Android Layouts and Widgets <ul style="list-style-type: none"> • Use the Menu class (Context menus, Options menus) • Views and ViewGroups <ul style="list-style-type: none"> o Declaration through XML o Dynamic creation • Event handlers and listeners • Using styles and themes for UI • Use of Material Design in consideration of UX |
| 8 | Midterm |
| 9 | Lists <ul style="list-style-type: none"> • Use a ListView and ListActivity • Using Adapters and AdapterView • Use RecyclerView |
| 10 | Fragments <ul style="list-style-type: none"> • Using fragments to partition the Activity UI • Fragment Class lifecycle • Implementing fragmentation via XML and dynamically |
| 11 | Use Local Database <ul style="list-style-type: none"> • SQLite overview • Use SQLite on Android • Create SQLite databases (www.sqlite.org) • Insert, delete, edit and query SQLite databases • Use a database Cursor and CursorAdapter display query results • Use the adb and Firefox plugin with SQLite |
| 12 | More User Interaction and Assets <ul style="list-style-type: none"> • Use the Dialog class • Use Assets and the AssetManager • Using built in Content Providers |
| 13 | Threading and AsyncTask <ul style="list-style-type: none"> • Introduction to Threads • UI thread Use AsyncTask |
| 14 | Networking and Remote data <ul style="list-style-type: none"> • Java and Apache HTTP classes • JSON data interchange format |
| 15 | Completion of project <ul style="list-style-type: none"> • Final system test of project |

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| | <ul style="list-style-type: none"> • Completion of project documentation • Demonstration of completed project |
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Activities:

Individual Labs

Students will complete a series of exercises that demonstrate knowledge of the Android SDK and its development environment.

Assignments

Students will complete a minimum of two assignments that illustrate use of specific components of the android Framework.

Project

Students will work in teams. There will a joint project done with the PHP course where students create both the frontend (Android) and backend components of a complete system. The project will involve the creation of an Android client which will connect to a backend apis and databases that feed JSON data. One of the remote data sources will be a website with a PHP and database component will be developed in the PHP course. Using a web based blogging system and website teams will maintain progressive group engineering logs. These will describe task assignment within the group, tasks that have been completed and any difficulties that are encountered.