



Western Technical College

10152185 Mobile Applications Development

Course Outcome Summary

Course Information

Description This course is an in-depth overview of developing mobile applications for devices that use the Android operating system. You will create many sample Android applications throughout the course, and by the end you should have a good understanding of the basics of Android development, and be able to build useful programs. Although there is a strong emphasis on the Android platform, we will briefly explore other approaches to mobile application development, including iOS and mobile web applications. It is assumed that you have a strong foundation in the Java programming language. We will review some of the more advanced uses of Java when creating Android applications, but you should have a good understanding of the basic features of Java before starting this class.

Career Cluster Information Technology

Instructional Level Associate Degree Courses

Total Credits 3

Total Hours 72

Pre/Corequisites

Prerequisite 10152153 Introduction to Java

Textbooks

Open Educational Resource: *Android Developer Fundamentals*. Produced by Google Developers. <https://developer.android.com/courses/fundamentals-training/overview-v2>. Optional.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections

2. Cultivate Passion: Expand a Growth-Mindset
3. Cultivate Passion: Increase Self-Awareness
4. Live Responsibly: Develop Resilience
5. Live Responsibly: Embrace Sustainability
6. Live Responsibly: Foster Accountability
7. Refine Professionalism: Act Ethically
8. Refine Professionalism: Improve Critical Thinking
9. Refine Professionalism: Participate Collaboratively
10. Refine Professionalism: Practice Effective Communication

Course Competencies

1. Explore advanced topics in Java development as they relate to the Android platform.

Assessment Strategies

- 1.1. Programs

Criteria

You will know you are successful when

- 1.1. you write a program that demonstrates inner classes.
- 1.2. you write a program that demonstrates inheritance.
- 1.3. you write a program that demonstrates method overloading.
- 1.4. you write a program that uses an interface.
- 1.5. you write a program that makes use of private instance variables and accessor/mutator methods.
- 1.6. you write a program that demonstrates basic usage of generics.

Learning Objectives

- 1.a. Define and apply inner, local, and anonymous classes.
- 1.b. Use interfaces.
- 1.c. Explain overloading methods.
- 1.d. Explain overriding methods.
- 1.e. Explore Java APIs and Android APIs.
- 1.f. Identify types of inheritance.
- 1.g. Use typed array lists.
- 1.h. Explore hash maps.
- 1.i. Explore method chaining.

2. Analyze the Android platform.

Assessment Strategies

- 2.1. Product

Criteria

You will know you are successful when

- 2.1. you create an application with multiple activities using Intents.
- 2.2. you write an application that demonstrates activity life cycle methods.
- 2.3. you create an application that uses system managers that are available in Android
- 2.4. you create application that uses Android resources, including strings, drawables, and layout files
- 2.5. you describe the security features of Android.
- 2.6. you explain the role of the Android manifest file.
- 2.7. you create an application that uses Notifications.
- 2.8. you create an application that uses Intents to launch other activities.
- 2.9. you create an application that uses Intents to launch other applications.

Learning Objectives

- 2.a. Explain the differences between native, hybrid, and web applications for mobile devices.
- 2.b. Explore the file structure of an Android project.
- 2.c. Describe the security features of the Android platform.
- 2.d. Explain the resources use in an Android application (strings, drawables, etc.).
- 2.e. Explore resource identifiers and the R class.
- 2.f. Explain the configuration files of an Android project.
- 2.g. Describe the components used to create Android Activities.
- 2.h. Explore Android Lifecycle Methods.
- 2.i. Introduce how Android uses the MVC design pattern.
- 2.j. Describe Android Intents and intent resolution.
- 2.k. Use Android Notifications.
- 2.l. Explain the purpose of Android Content Providers.

3. **Apply tools and/or resources used in the development of Android applications.**

Assessment Strategies

- 3.1. Skill Demonstration
- 3.2. Product

Criteria

You will know you are successful when

- 3.1. you install Java before setting up for Android development.
- 3.2. you set up an emulator using the Android Virtual Device Manger.
- 3.3. you develop applications for the appropriate version of Android using Android SDK Manager.
- 3.4. you create an application and install it on an Android device.
- 3.5. you use Android Studio.
- 3.6. you manage code using a version control system.

Learning Objectives

- 3.a. Use the Android Studio IDE.
- 3.b. Use various tools included in the Android SDK.
- 3.c. Use a version control system.
- 3.d. Explore the Android developer portal.

4. **Investigate user interface design for mobile devices.**

Assessment Strategies

- 4.1. Product

Criteria

You will know you are successful when

- 4.1. you create an application that uses a LinearLayout.
- 4.2. you create an application that gathers user input.
- 4.3. you create an application that responds to configuration changes.
- 4.4. you create an application in which Java code accesses components in a layout file.
- 4.5. you use various components that are available when creating user interfaces for Android applications.
- 4.6. you create an application that references string resources.
- 4.7. you create an application that has a top-level activity, one or more category activities, and one or more detail/edit activities.
- 4.8. you create an application that uses fragments.

Learning Objectives

- 4.a. Investigate methods of responding to user input.
- 4.b. Explore methods of organizing content for mobile applications.
- 4.c. Explore integrating applications with other applications and features of the Android operating system.
- 4.d. Use various media in an Android application.
- 4.e. Explore layouts for an Android project including alternative layouts (for tablets, landscape mode, etc.).
- 4.f. Explore controls used in UI such as buttons, text fields, lists, check box, zoom buttons, toggle buttons, etc.
- 4.g. Investigate data binding.
- 4.h. Examine Views and ViewGroups.
- 4.i. Explore device configuration changes.

5. Explore various methods of storing and displaying data for mobile applications.

Assessment Strategies

5.1. Product

Criteria

You will know you are successful when

- 5.1. you create an application that uses a SQLite database.
- 5.2. you create an application that uses HTTP to fetch data from the internet.
- 5.3. you create an application that stores data on the devices file system.
- 5.4. you create an application that uses adapters to display data.
- 5.5. you create their own custom adapter to display data.

Learning Objectives

- 5.a. Examine SQLite as a data store for an Android application.
- 5.b. Explore HTTP as a method of retrieving data from the cloud .
- 5.c. Explore HTTP to send data to the cloud.
- 5.d. Work with model objects.

6. Apply methods of troubleshooting and debugging Android applications.

Assessment Strategies

6.1. Skill Demonstration

Criteria

You will know you are successful when

- 6.1. you use LogCat for tracing messages and troubleshooting.
- 6.2. you step through code as it runs using Android Studio Debugger.
- 6.3. you handle exceptions using Try/Catch statements.

Learning Objectives

- 6.a. Use trace logs.
- 6.b. Explore debugging tools in Android Studio.
- 6.c. Utilize exception handling code in an Android application.

7. Integrate an Android app with a web service.

Assessment Strategies

7.1. Product

Criteria

You will know you are successful when

- 7.1. you use a HTTP library to communicate with a web service.
- 7.2. you use a JSON library to communicate with a web service.

Learning Objectives

- 7.a. Incorporate libraries into the app.
- 7.b. Use HTTP.
- 7.c. Use JSON.

8. Build a practical Android application.

Assessment Strategies

8.1. Product - Android app

Criteria

You will know you are successful when

- 8.1. you include a user interface that displays data in a list.
- 8.2. you include a user interface that allows users to enter/edit data.
- 8.3. you verify the app validates user input.
- 8.4. you verify the app uses model objects.
- 8.5. you ensure the app stores data in a SQLite database.

8.6. you ensure the app sends and receives data from the cloud by using HTTP.

Learning Objectives

8.a. Incorporate all aspects of Android application design and development from this course into a practical program.