Android Programming
Android Beginners: Level 1

Nature of the Course: Theory + Practical
Total Hours per Day: 2 Hours
Course Duration: 4 Weeks

Course Summary

The DTC - Android 1 course is targeted for beginners who want to learn how to think and write meaningful pieces of codes or read codes written by someone else in ANDROID. This course teaches how to map literary description of a problem (requirement) to an application/library coded in Android. This is a core basic level course that is essential for anyone who has no prior programming experience but wishes to be a professional Android engineer in future.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:

1. Has attended 90% of all classes held.
2. Has received an average grade of 80% on all assignments
3. Has received an average of 60% in assessments.
4. The tutor believes the student has grasped all of the concepts and is ready to go on to the next module.

Required Text Books

1. Dawn Griffiths and David Griffiths, "Head First Android Development", O'Reilly.
2. Barry Burd, "Java Development for Android Developers for Dummies", Wiley.

Prerequisites

- Basic knowledge of programming, bits/bytes, procedures, classes, computer architecture, etc. If you just have a theoretical knowledge that is perfectly okay but you should have strong convictions on what programming is, and what you hope to achieve from this class.
- Willing and eager to spend at least 10-20 hours (varying from student-to-student) per week outside of the training class to read/write codes in ANDROID (self-study and practice).

- There is no prior educational level requirement for this course. Anyone from 10+2 student to someone who is doing her PHD in Genetic Engineering is welcome to take this course.
- If you are only interested in theory and have no interest/patience in spending at least 10 hours every week throughout the duration of the course, then this course might not be for you.
- If you have absolutely no idea about programming or do not see yourself doing programming in the next six -odd months, then this class may not be for you.

Course Details
WEEK 1
BASIC JAVA
- Introduction
- Examples: Looping, Decision, Exception Handling, Lists, Maps, Arrays
- Installation of JDK

OVERVIEW OF ANDROID
- Introduction
- Hardware/Software Requirements
- Dalvik Virtual Machine and .apk File Extension

WEEK 2
APPLICATION STRUCTURE
- Androidmanifest.xml
- Uses-Permission & Uses-SDK
- Assets, Layouts & Drawable Resources
- Values – strings.xml
- Activities & Activity Lifecycle

EMULATOR – ANDROID VIRTUAL DEVICE
- Introduction & Available Emulators
- Launching Emulator
- Editing Emulator Settings
- Emulator Shortcuts
- Logcat Usage

WEEK 3
LAYOUT DESIGN
- Form Widgets (Button, Spinner, Checkbox, Edit Text)
- Text Fields
- Layouts (Relative Layout, Table Layout, Frame Layout, Linear Layout)
- Nested Layouts
- [dip, dp, sip, sp] Vs. px

UI DESIGN
- Time and Date
- Images and Media
- Composites
- Alert Dialogues and Toast
- Popups
- Web-View

WEEK 4
PREFERENCES
- Shared Preferences
- Preferences from XML

MENU AND INTENT
- Option Menu
- Context Menu
- Sub Menu
- Menu from XML
- Menu via Code
- Explicit Intents
- Implicit Intents
- Switching Activities
- Put Extras

LABS
Lab assignments will focus on the practice and mastery of contents covered in the lectures; and introduce critical and fundamental problem-solving techniques to the students.

Intermediate Android: Level 2

Nature of Course: Theory + Practical
Total Course Hours per Day: 2 Hours
Course Duration: 4 Weeks

Course Summary

The DTC - ANDROID – Level 2 course is designed for students who have some prior hands-on programming experience with the ANDROID programming language at a beginning level. This course is ideal for people who have previously programmed in another programming language (e.g., Java, Obj-C, PHP, C, C++, etc.) and wish to learn Android. This course is designed for high school and university students who want to do ANDROID coursework, including those who are already working as a professional VB.NET developer and want to switch to ANDROID, as well as those who have worked in the media industry since graduation or are working as a professional freelance PHP developer.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:
1. Has attended 90% of all classes held.
2. Has received an average grade of 80% on all assignments
3. Has received an average of 60% in assessments.
4. The tutor believes the student has grasped all of the concepts and is ready to go on to the next module.

Required Text Books
1. Dawn Griffiths and David Griffiths, "Head First Android Development", O'Reilly.
2. Barry Burd, "Java Development for Android Developers for Dummies", Wiley.
3. Erik Hellman, "Android Programming: Pushing the Limits", Wiley.

Prerequisites
- Successfully complete the entrance test with score of at least 40% (for trainees directly applying to this level).
- Successfully complete the DWIT Training - ANDROID – Level 1 course (not applicable to trainees directly applying to this level).
- Successfully complete the interview.

- Willing and eager to spend at least 10-20 hours (varying from student-to-student) per week outside of the training class to read/write codes in ANDROID (self-study and practice).

Course Details

WEEK 1

STYLE & THEMES

- Styles.XML
- Colors.XML – Declaring Colors and Drawable.
- Drawable Resources for Shapes, Gradients
- Shape Drawable
- State Drawable
- Transition Drawable
- Ripple
- 9 Patch Drawable
- Style Attribute in Layout File
- Applying Themes via Code and Manifest File

NOTIFICATIONS

- Broadcast Receiver Services and Notifications
- Toast
- Alarms

WEEK 2

ADAPTERS & WIDGETS

- Adapters
- Array Adapters
- Base Adapters
- Example – Efficient Adapter
- List View and List Activity
- Custom List View
- Grid View using Adapters
- Gallery using Adapters
- Recycler View
- Card View
- Creating and Updating the Widget

THREADS

- Threads running on UI Thread
- Worker Thread
- Handlers & Runnable
- Asyntask

WEEK 3
FRAGMENT

- Fragments
- Communication between Fragments
- Fragment Paper Adapter
- Dialog Fragment
- View Pager Indicator
- Circle View Pager Indicator
- Tab View Pager Indicator
- Tab View Pager Indicator
- Line Page Indicator
- Action Bar Tabs and Custom Views on Action Bars
- Toolbars
- Navigation Drawer

MULTIMEDIA

- Playing Audio Files (Local/Network)
- Simple Video Playback

WEEK 4
HARDWARE ACCESS

- Using SD Cards – Reading and Writing
- Maps via Intent and Map Activity
- Accessing Phone Services (Call, SMS, MMS)
- Network Connectivity Settings
- Using Wi-Fi and Bluetooth
- Sensors

LABS

Lab assignments will focus on the practice and mastery of contents covered in the lectures; and introduce critical and fundamental problem-solving techniques to the students.

Advanced Android: Level 2

Nature of Course: Theory + Practical
Total Course Hours per Day: 2 Hours
Course Duration: 4 Weeks

Course Summary

This course expands on the DTC – ANDROID – Level 2 foundation and offers advanced subjects to equip learners for a career as an Android software engineer.

Completion Criteria

After fulfilling all of the following criteria, the student will be deemed to have finished the Module:

1. Has attended 90% of all classes held.
2. Has received an average grade of 80% on all assignments
3. Has received an average of 60% in assessments.
4. The tutor believes the student has grasped all of the concepts and is ready to go on to the next module.

Required Text Books

5. Mark Murphy, "The Busy Coder's Guide to Advanced Android Development", CommonsWare.
6. Greg Nudelman, "Android Design Patterns", Wiley.
7. Erik Hellman, "Android Programming: Pushing the Limits", Wiley.

Prerequisites

- Successfully completed the DWIT Training - ANDROID – Level 2 or obtained at least 40% score on the entrance exam.
- The latter case applies for new students that are directly attempting this training.
- Successfully complete the interview.
- Willing and eager to spend at least 10-20 hours (varying from student-to-student) per week outside of the training class to read/write codes in ANDROID (self-study and practice).
- Please note that this is a lab intensive course where the students will be expected to work on lab exercises for approximately half the duration of the session.

Course Details

WEEK 1

SQLITE PROGRAMMING

- SQLite Programming
- SQLite Open Helper
- SQLite Database
- Cursor
- Content Providers
- Defining and Using Content Providers
- Providers
- Reading and Updating Contacts Reading Bookmarks

WEEK 2

OTHERS

- Creating Own Separate Project Module
- Integrating Project Module in Own Apps
- Including External Libraries in our Application
- Push Notification
- Facebook API Notification

WEEK 3

GAME DEVELOPMENT

- Introduction to Game Engine in Android

WEEK 4

LABS

Lab assignments will focus on the practice and mastery of contents covered in the lectures; and introduce critical and fundamental problem-solving techniques to the students.

Learning Outcomes

- Ability to understand the major dynamics and restrictions that affect mobile devices and how to account for them while planning and developing Android apps.
- Ability to understand and solve Android-related difficulties by knowing where to look for extra sources of knowledge.
- Become familiar with the organization, patterns, and programming techniques of the Android platform and be able to use them to create their own Android applications.