



# Hewlett Packard Enterprise

Course Datasheet

## **JAVA with ANDROID**

Education Services course product number – HPE-JaAND-v1.0

Course length – 100 Hrs.

Delivery mode – Instructor Led Training (ILT)

Virtual Instructor Led Training (vILT)

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Android is an open source project of the Open Handset Alliance that has revolutionized the user experience of a mobile device. Android is a platform for mobile devices, which includes an OS, middleware and some key applications. The OS is based on a variant of Linux Kernel. The biggest advantage is that the success of Android depends on the availability of unique and engaging user applications created by developers.

### Course Objective

To understand the android platform architecture:

- Difference between Android and other mobile development environments.
- Design, develop, debug, and deploy Android applications,
- Use Android SDK's simulator to test and debug applications,
- Construct user interfaces with built-in views and layouts.
- Advantage of APIs for data storage, retrieval, files, databases etc.

### Prerequisite

No experience is required.

### Course Modules

#### Core Java

##### Chapter 01 – Introduction to JAVA Technology

- Introduction to JAVA Technology
- JAVA Language Features
- What is JAVA bytecode? What is JVM?
- Different Editions of JAVA
- Writing the "Hello World" command-line Application
- Understanding the "main()" method
- Setting path & classpath

## Course Datasheet

### Chapter 02 – Language Fundamentals I

- Keywords
- Primitive Data types
- Legal & Illegal Identifiers
- Different types of Literals
- String Literals
- Different types of JAVA Comments
- Declaring & Initializing variables
- Declaring constants using “final” keyword
- Object-oriented Features
- Implementing OO Concepts: Defining Classes
- Variables and methods as members of a class
- Object reference variables
- Restricting the access to object’s members using an access specifier
- Different types of access specifiers
- Understanding the proper encapsulation

### Chapter 03 – Language Fundamentals II

- Lifetime of Variables
- Instance methods and class methods
- Understanding Polymorphism
- Types of polymorphism
- Implementing static polymorphism in JAVA
- Understanding Inheritance
- Implementing single inheritance using “extends” keyword
- Implementing dynamic polymorphism
- Using “final” keyword for
- Abstract methods & Abstract classes

### Chapter 04 – Language Fundamentals III

- Understanding the need of packages
- Creating a package
- Compiling and Running Code from Packages
- Importing a package
- Understanding the proper use of “protected” keyword
- Operation on Primitives: Using Operators
- Different types of operators
- Precedence & associativity rules for operators
- Evaluation order of operands
- Conversions
- Numeric Promotions:- Unary and Binary Numeric Promotions
- Floating-point arithmetic and “strictfp”

### Chapter 05 – Language Enhancements (Java 7)

- Annotation
- Strings in Switch
- The try-with-resources Statement
- Type inference for generic instance creation
- Implementing binary literals
- Catching multiple exception types and rethrowing exceptions with improved type checking

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- Improved varargs method invocations

### Chapter 06 – Arrays, String and Wrapper Class

- Working with Arrays in JAVA
- Method Overloading Issues : using var-args methods
- Working with Strings
- Primitive Wrappers

### Chapter 07 – Concept of interface, Abstract class and Exception Handling

- Interface
- What is Exception
- Exception class-hierarchy
- Understanding the difference between checked & unchecked exception
- Understanding stack-based execution
- Handling exceptions( using try-catch-finally blocks )
- Proper use of throw and throws clauses
- Chained Exception

### Chapter 08 – Nested Class

- Overview of nested classes and interfaces
- Types of Nested Class
- Complete understanding of static nested class
- Complete understanding of non-static nested classes/Inner classes
- Local classes
- Anonymous classes
- Anonymous Interface

### Chapter 09 – Multi-threading

- Introduction
- What is a Thread
- Asynchronous Behaviour/ Race condition
- Creating a thread
- Thread Life Cycle, states and their transition
- Using methods from java.lang.Thread for state transition
- Need of synchronization? Concept of Object Locking
- Language-level support for synchronization : “synchronized” keyword
- Defining synchronized methods & understanding its importance
- Using synchronized block
- Inter-thread communication
- Deadlock condition

### Chapter 10 – Stream-Based I/O

- Understanding Streams
- Types: character and Binary streams
- Input and Output Streams
- Understanding Stream class Hierarchy
- Line-oriented I/O
- Buffered Streams
- Scanning and Formatting
- I/O from the command-line

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- Standard streams
- The console
- Data streams
- Random Access File
- Serialization

### Chapter 11 – NIO

- New APIs for file system access
- The java.nio.file package

### Chapter 12 – Generics

- Understanding compile-time type-safety
- Introduction to Generics
- Defining a Generic class
- Understanding Type Parameters
- Understanding Type Erasure Process
- Sub-typing and Super-typing
- Using wildcards
- Using “? extends T” and “? Super T”
- Generic methods

### Chapter 13 – Collection Framework

- Introduction to collections
- What is a collection framework
- Benefits of collection framework
- Interface Hierarchy

### Chapter 14 – The java.util.Collection interface: Supported Operations

- Basic Operations
- Bulk Operations
- Array Operation

### Chapter 15– Traversing collections

- Using for-each loop
- Using Iterator

### Chapter 16 – The java.util.List interface: Supported Operations

- Positional Access
- Search
- Iteration
- Range-View

### Chapter 17 – The java.util.Set interface: Supported Operations

- Basic Operations
- Bulk Operations
- Array Operations

## Course Datasheet

### ANDROID

#### Chapter 01 – Android Overview

- Android Anatomy and Physiology
- Mobile Application Development Overview
- Comparison with other development platform (J2me, Symbian etc)

#### Chapter 02 – Android Architecture

- Android Stack Overview of Stack Linux Kernel
- Native libraries
- Dalvik VM
- Application Framework

#### Chapter 03 – Android SDK Overview

- Platform
- Tools
- Android Development Kit
- AVD
- Emulators
- Mksdcard
- Sqlite 3
- Plug in
- Eclipse

#### Chapter 04 – Setup Android Development Environment

- System requirements
- Eclipse and SDK installation, AVD creation
- Creating first Android application
- Project Structure

#### Chapter 05 – Android Application Fundamental

- Android application building blocks
- Activating components
- Shutting down components
- LifeCycle of Application

#### Chapter 06 – Main Building Block

- Activity
- Intents
- Services
- Content Providers
- Broadcast Receivers

#### Chapter 07 – User Interfaces

- XML Vs Java UI
- Layouts
- Common UI Component
- Drag and Drop UI Design
- Menu Creation, Dialog, Toast, Alert, Time Picker, Date Picker, Custom Dialog

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- Pre-condition and Post-condition

### Chapter 08 – Handling User Event

- Event listeners
- Event handlers
- Touch mode
- Focus Mode

### Chapter 09 – Notifying User

- Toast Notification
- Status Notification
- Applying Style and them

### Chapter 10 – Application Resource

- Providing Resources
- Accessing Resources
- Handling Run Time changes
- Localization
- Resources Type

### Chapter 11 – Android System Overview

- Preferences
- Notifications
- Security model
- File System

### Chapter 12 – Multimedia in Android

- Multimedia Supported audio formats
- Simple media playback
- Supported video formats
- Simple video playback

### Chapter 13 – Date Storage

- Shared Preferences
- Internal Storage (Files)
- External Storage(SD Card)
- SQLite Databases

### Chapter 14 – Security and Permissions

- Security Architecture
- Debug Certification
- Certificate & keystone creation
- Self certifications
- Application Signing

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### Chapter 15 – Graphics

- 2D Graphics
- 3D Graphics

### Chapter 16 – Location and Map

- Map Layout
- Get user Location

### Chapter 17 – Basic Content Provider

- Content provider MIME types
- Searching for content
- Adding, changing, and removing content
- Working with content files

### Chapter 18 – Services

- Overview of services in Android
- Implementing a Service
- Service life-cycle
- Bound versus unbound services

### Chapter 19 – Broadcast Receiver

- What are Broadcast Receivers
- Implementing broadcast receiver
- System broadcasts and how to use them

### Chapter 20 – Intent Filter

- Role of filters
- Intent-matching rules
- Filters in your manifest
- Filters in dynamic Broadcast Receivers

### Chapter 21 – Sensors

- How Sensors work
- Listening to Sensor readings

### Chapter 22 – WiFi

- Monitoring and managing Internet connectivity
- Managing active connections
- Managing WiFi

### Chapter 23 – Camera

- Taking pictures
- Rendering previews

### Chapter 24 – Bluetooth

- Controlling local Bluetooth device
- Discovering and bonding with Bluetooth devices

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- Managing Bluetooth connections
- Communicating with Bluetooth