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Java + Android



Course Guide

Java Language is a multi-paradigm programming language encompassing strong typing, imperative, declarative, functional, generic, object-oriented (class-based), and component-oriented programming disciplines.

More than a billion phones and tablets around the world run Android. It's customizable, easy to use, and since it's made by Google, Android phones and tablets work perfectly with all your favorite Google apps.



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Java + Android Course Contents

Java + Android curriculum follows the ATC and Oracle Certified Associate Java SE standards which are designed to meet the requirements of next generation mobile programming needs.

Java Introduction

- What is Java?
- History
- Versioning
- The Java Virtual Machine
- Writing a Java Program
- Packages
- Simple Java Programs

Language Components

- Primitive Data Types
- Comments
- The for Statement
- The if Statement
- The while and do while Statements
- The switch Statement
- The break Statement
- The continue Statement
- Operators
- Casts and Conversions
- Keywords

Object-Oriented Programming

- Defining New Data Types
- Constructors
- The String Class
- String Literals
- Documentation
- Packages
- The String Buffer Class
- Naming Conventions
- The Date Class
- The import Statement
- Deprecation
- The StringTokenizer Class
- The Decimal Format Class

Methods

- Introduction
- Method Signatures
- Arguments and Parameters
- Passing Objects to Methods
- Method Overloading

- Static Methods
- The Math Class
- The System Class
- Wrapper Classes

Arrays

- Introduction
- Processing Arrays
- Copying Arrays
- Passing Arrays to Methods
- Arrays of Objects
- The Arrays Class
- Command Line Arguments
- Multidimensional Arrays

Encapsulation

- Introduction
- Constructors
- The this Reference
- Data Hiding
- Public and private Members
- Access Levels
- Composition
- Static Data Members

Inheritance & Polymorphism

- Introduction
- A Simple Example
- The Object Class
- Method Overriding
- Polymorphism
- Additional Inheritance Examples
- Other Inheritance Issues

Abstract Classes and Interfaces

- Introduction
- Abstract Classes
- Abstract Class Example
- Extending an Abstract Class
- Interfaces

Exceptions

- Introduction
- Exception Handling
- The Exception Hierarchy
- Checked Exceptions
- Advertising Exceptions with throws
- Developing Your Own Exception Classes
- The finally Block

Input and Output in Java

- Introduction
- The File Class
- Standard Streams
- Keyboard Input
- File I/O Using Byte Streams
- Character Streams
- File I/O Using Character Streams
- Buffered Streams
- File I/O Using a Buffered Stream
- Keyboard Input Using a Buffered Stream
- Writing Text Files

Threads

- Threads vs. Processes
- Creating Threads by Extending Thread
- Creating Threads by Implementing Runnable
- Advantages of Using Threads
- Daemon Threads
- Thread States
- Thread Problems
- Synchronization

Android

Android training course requires:

- JDK 6, 7 or later
- Eclipse 3.5 or later
- Android SDK (available from <http://developer.android.com/sdk/index.html>); this course can be tailored for any Android 4.x or 3.x version
- Android Eclipse Plugin

The Basics

- What is Android?
- Architecture Explained
- Role of Java

Android SDK

- Eclipse IDE Plugin
- Device Emulator
- Profiling Tools
- Hello World Application

Unit Testing and Debugging

- Creating Unit Tests
- Android Development Tools (ADT)
- Using the Emulator
- Analyzing the Heap

Android User Interface

- View Hierarchy
- Menus
- Fragments

Lab work

Styling Widgets

- Defining Styles
- Applying Styles to the UI
- Platform Styles and Themes

Layout

- Layout Containers
- Weight and Gravity
- Layout Techniques Handling Events

Advanced Widgets

- ScrollView
- +ViewPager
- TabView
- Custom Views

Lab work

Storing and Retrieving Data

- Internal and External Storage
- Preferences

Content Providers

- Querying Content Providers
- Modifying Data
- Creating a Content Provider

Asynchronous Tasks

- Main UI Thread
- Using AsyncTask

Lab work

Location Services and Maps

- Location Services
- Mock Location Data
- Google Map Libraries

Web View

- Web Apps Overview
- Targeting Screens from Web Apps
- Web View
- Debugging Web Apps
- Best Practices for Web Apps

Best Practices

- Compatibility
- Supporting multiple screens
- Optimizing for Other Android Versions

Lab work

Final Project

Conclusion

Practical Approach

- A real example will be given throughout the lectures, starting from design, analysis, implementation and maintenance.

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